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Impact of Terrorism on Consumer Sentiment in Pakistan: A City-Level Analysis

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Abstract

This study estimates the impact of terrorism on consumer sentiment at city level in Pakistan. Tagged as one of the most dangerous places of the world, Pakistan is the epicenter of terrorism since the events of 9/11. Apart from tangible financial losses and civilian casualties, there is an equally important but unnoticed and intangible impact of terrorism on consumer sentiment in Pakistan. Consumer sentiment is an important indicator as it triggers economic activity and in case of Pakistan, consumer sentiment measured by Diffusion Index is used as a policy input in formulation of monetary policy. Using city fixed effects model on balanced panel data of 59 cities and 36 time periods (bi-monthly), the study estimates that whenever there is a terrorist incident in a city, irrespective of the intensity of the attack; sentiment of the consumers in the targeted city turns pessimistic (diffusion index decreases) relative to those cities which do not face an attack. The coefficient of terrorism is equal to one-half standard deviation of the diffusion index (consumer sentiment) and is consistent in all specifications. Reverse causality test indicates that occurrence of terrorist activity is exogenous i.e., current, and past sentiment do not impact or promote terrorism. Since the impact of terrorism is more significant at the affected cities, there is a need for a region-specific (city-specific) counter-terrorism policy instead of a generic national policy.

Keywords: terrorism, consumer sentiment, diffusion index, counterterrorism, war on terror

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Introduction

The incident of 9/11 (11 September 2001) took place in the United States of America (US) two decades ago; however, the spillover effects of this incident continue to haunt many places around the globe, Pakistan being no exception. Pakistan became a key ally of the US in the Global War on Terror (GWOT); consequently, incidents of terrorism increased dramatically in Pakistan. Tagged as "the world's most dangerous place" by The Economist and being a permanent member of top five countries affected by terrorism according to the Global Terrorism Index 2017, Pakistan has been the epicenter of terrorism since 2001.

The continuous and intense wave of terrorism has taken lives of more than 60,000 innocent people of Pakistan. Every year 3-5 percent of total deaths in Pakistan are because of terrorism. Around 500,000 people have been internally displaced. On the financial front, on average, 2-3 percent of GDP per year is lost because of terrorism. Pakistan has suffered a loss of US$ 123 billion since 2001 and almost US$ 33 billion during last five years in the form of loss of infrastructure, compensation to victims, foreign disinvestment, industrial output, disruption in supply chains, etc.[1] This amount is double the amount of Pakistan's external public debt.

No part of Pakistan is considered safe as there is no specific pattern of these attacks. Primary schools, shopping malls, airports, cricket stadium, police check posts, hospital, army's head quarter, entertainment parks, shrines, praying areas, public rallies, bus, and train stations have been attacked by the terrorists since 2001. Prior to 9/11, the frequency of terrorist activities in Pakistan was negligible and limited to areas next to the border with Afghanistan. However, this trend changed dramatically, and the terrorist activities shifted from the southern end of the country to almost all parts of Pakistan (Saeed et al., 2014).

The rise of violent extremism and increase in terrorism in Pakistan not only caused serious damage to Pakistan's economy in terms of financial losses and civilian casualties but terrorism also has an equally important but unnoticed impact on an ordinary citizen. To be precise, terrorism hampers consumer sentiment over time. To some extent, the impact on business and investment sentiment can be gauged by looking at the performance of the stock market following a terrorist event however no efforts have been made to estimate the impact of terrorism on the economic sentiment of the households in Pakistan. Consumer sentiment is very important not only theoretically as sentiment triggers economic activity but in case of Pakistan, consumer sentiment measured by diffusion index (DI) is used as a policy input. While macro data at national level is useful to analyze the major economic implications, it fails to provide any conclusive direction that how the number of terrorist incidents and consumer sentiment are linked. Hence it is imperative to do analysis of consumer sentiment at city-level to have cross-sectional variations.

This study addresses the broader research question: whether the impact of terrorism on consumer sentiment depends on the intensity and the occurrence of the attack in a city? Based on research question, following null hypothesis and alternative hypothesis are formulated:

> *Null Hypothesis:* terror activity has no impact on consumer sentiments.
> *Alternative Hypothesis:* terror activity has an impact on consumer sentiments.

[1] Economic Survey of Pakistan 2020-21. Ministry of Finance, Government of Pakistan.

There are few studies for developed countries like the US, UK, Israel, and Spain, which estimates the impact of terrorism on household economic decisions and spending behavior, however these studies are either based on *one off* event or are limited to a particular area of a country which allows the authors to make use of a natural experiment.

Feelings tend to play an important role in stimulating economic activity as evident by the conclusion of numerous studies. Terror events have implications on both physical and mental health (Yehuda & Hyman, 2005). Visceral factors (negative emotions for instance anger and fear) force people to act and behave differently when they encounter unnormal situation. Hence, it is imperative to include visceral factors into models of economic behavior to gauge the viscerally driven behavior as these factors have underappreciated but vital consequences for human behavior (Loewenstein, 2000). In another study, 39 survivors of terrorist attacks and 2,124 survivors of motor vehicle accidents were assessed for the prevalence of posttraumatic stress disorder (PTSD) upon admission to a general hospital emergency room. The same survivors were evaluated 1 week and 4 months later. Results showed that survivors of terrorist attacks had higher rates of stress disorder than those survivors who faced motor vehicle accidents (Shalev & Freedman, 2005).

The probability (chances) of facing terrorism is low but the fear created by terrorism has intense and long-lasting impact on behavior of an individual. This study used the response of Israelis to terror incidents. This study divided the individuals into two categories, those who are frequent users of goods & services and those who are occasional users. The study estimated the impact of bus-related suicide attacks on the usage of public bus transport and cafe related terrorist incident on visits to cafe. Findings revealed that there is no impact of terrorism on frequent users of these services; however, the impact on occasional users is quite significant (Becker & Rubinstein, 2011).

Emotions and feelings have an impact on financial decisions. Emotions such as fear and anxiety make people risk averse and they are less confident to make and evaluate investment decisions; on the contrary, positive feelings as excitement compels people to be risk-takers (Kuhnen & Knutson, 2011).

In case of Pakistan, no area is immune and there is a continuous wave of terrorism for the last 20 years and there is no specific trend. Hence, this study is an attempt to fill in the gap and estimate the impact of terrorism on consumer sentiment at city-level.

In this study, two datasets are utilized. First, the dataset of number of terrorist attacks and its intensity (gauged through the total number of victims killed or injured). This terrorism data includes information such as the date, place, and magnitude of the attack. The magnitude of the attack can be seen through the total number of civilians and security forces killed or injured during the attack. During the period of analysis, out of 59 cities, 25 cities did face a minimum of one attack. Second, the Consumer Confidence Survey (CCS) data used in this study cover the periods from Jan 2017 to Nov 2021 (thirty-six waves consisting of almost 70,000 households in 59 cities). Out of these 70,000 households, roughly forty thousand households did not face terrorist attack in their cities while thirty thousand households faced an attack in their cities.

Impact of terrorism is estimated in two ways; 1) terrorism used as binary variable = 1 if city faced an attack and 2) intensity of the attack i.e., total number of people killed or injured during an attack. Few cities have been targeted more during the last 20 years; hence it was

important to incorporate a variable which captures the historical trend of attacks during each city. Adding this variable serves two purposes; robustness check of basic panel model and secondly this variable itself has intuitive implications because people living in those areas which are frequently attacked may have different sentiment (fears).

For consumer sentiment, the results show that intensity of the attack (number of victims killed or injured) is not statistically significant however when terrorism is used as a binary variable (= 1 if city faced an attack) consumer sentiment (diffusion index) in affected cities decreases relative to those cities which do not face an attack. The news of an attack triggers fear and unrest amongst an ordinary household no matter how big or small the intensity of the attack is.

Although several control variables have been used for robustness purposes, still important variables such as city-level GDP and city-level industrial production are unavailable in Pakistan. If such dataset of real economic activity was available, broader impact of terrorism on the economy would have been estimated however that is not the scope of this study.

The rest of the paper is organized as follows: Section 2 contains details on the data sets and data description. It is followed by the identification strategy and the model described in Section 3. Regression Results and robustness checks are given in Section 4. Lastly, discussion and conclusions are made in Section 6.

Data Description

Consumer sentiment is one of the leading indicators of economic activity. Perception about economic indicators such as inflation, interest rate and employment are important for a country like Pakistan in which forward-looking policy formulation has been adopted.

State Bank of Pakistan (the central bank) in partnership with the Institute of Business Administration (IBA, a leading university) conducts the Consumer Confidence Survey on a national scale largely following the University of Michigan Consumer Sentiment Survey. The information obtained through this survey is used to construct current, expected and overall confidence indices, which are then used in monetary policy formulation and short-term forecasting. This survey is an important source of primary data.[2]

The IBA-SBP Consumer Confidence Survey (CCS) covers about 1800 households contacted through fixed line telephone across Pakistan and is conducted regularly bi-monthly during the first five days of January, March, May, July, September, and November. In terms of coverage, it covers almost all regions of Pakistan. The questionnaire is asked in different regional languages to ensure maximum outreach. The whole population of Pakistan is divided into 59 strata and each strata gets representation in the sample according to its population. Districts with population equal to/less than 5% of their respective province's population are merged based on their geographical vicinity into one stratum. Districts with more than 5% share in their respective provincial population are considered individual strata. The survey is conducted preferably by the head of the household or anyone involved and responsible for financial matters of the household. The questionnaire mostly adopts the University of Michigan Consumer Sentiment Survey, which solicits qualitative responses on a Likert scale

[2] State Bank of Pakistan. http://www.sbp.org.pk/research/CCS.asp. Accessed 15 May 2021.

having five responses plus "Don't Know" option. The target respondent is a personality who is a financially responsible member of the household.

In addition, household characteristics such as number of households, age, income, occupation, and qualification of the respondents are also part of the survey. These household characteristics are used as control variables in this study going forward.

SBP reports results of households' survey, in the form of Diffusion Index (DI). The Diffusion Index shows the general tendency of respondents about a certain aspect of a particular survey. The questionnaire for this survey offers five types of options to the respondents for each question.

PP = Increase/improve significantly; P = Increase/improve;
E = Unchanged/neutral; N = decline /deteriorate; and
NN = decline/deteriorate significantly.

On the basis of these five options, the Diffusion Index is computed in the following two steps:

Step 1: Net Response (NR) is computed as below:
NR = (1.00*PP) + (0.50 × P) + (-0.50 × N) + (-1.00*NN).

Step 2: Diffusion Index (DI) is computed as follows: DI = (100 + NR) / 2
Where DI ranges from 0 to 100; interpretation of which is as follows:
DI > 50 indicates that Positive views are more than Negative views;
DI = 50 indicates that Positive views and Negative views are equal;
DI < 50 indicates that Positive views are less than the Negative views.

Table 1 gives the % share of responses by the respondents who faced and did not face terrorist attacks during the period under review. As it is evident in the table that respondents who did not face terrorism in their cities have higher positive responses compared to those who did face terrorism in their cities.

State Bank of Pakistan officially releases the diffusion index at the macro level. However, for this study diffusion index has been calculated for 59 cities to have cross-sectional variation. The difference will show whether terrorism influences the consumer sentiment keeping other factors (such as household size, income, qualification) controlled.

Table 1
Percentage Share of Positive & Negative Responses

	Did not face terrorism	**Face Terrorism**
% of -ve ans	40	43
% of ext. -ve ans	3	5
% of neutral ans	34	35
% of +ve ans	19	16
% of ext. +ve ans	2	1

Source. State Bank of Pakistan, Analyst's estimates

The Consumer Confidence Survey (CCS) data used in this study will cover the periods from Jan 2017 to Nov 2021 (thirty-six waves consisting of almost 70,000 households). Out of these 59 cities, 34 cities did not face terrorist attack in their cities while the rest 25 cities did face a minimum of one attack.

The data of main independent variable i.e. terrorism includes information such as data, location and its intensity (gauged through the total number of victims killed or injured).[3] This data is provided by the Ministry of Information, Government of Pakistan, and counter checked with Global Terrorism Database and South Asia Terrorism Portal (Institute for Conflict Management).[4] In order to check whether consumers of a particular city (strata) are impacted by a terrorist attack, that will be estimated by looking at the data of terrorist attack before a particular wave. For instance, survey is conducted during the first week of January 2017, hence the number of terrorist attacks prior to this week will be considered (Table 2).

Table 2
Data Merging for Main Model

Time Period	City-level Terrorism	City-Level Sentiment
1	6-Nov-31st Dec 2016	1 Jan – 5 Jan 2017
2	6-Jan-28th Feb 2017	1 Mar – 5 Mar 2017
3	6-Mar-30th April 2017	1 May – 5 May 2017
4	6-May-30th Jun 2017	1 Jul – 5 Jul 2017
5	6-Jul-30th Aug 2017	1 Sep – 5 Sep 2017
.	.	.
36	6-Sep-30th Oct 2021	1 Nov -5 Nov 2021

Source. State Bank of Pakistan, Ministry of Information

As mentioned earlier, Pakistan has been facing continuous and indiscriminate terrorist attacks over the last 20 years, however there have been few cities which have been targeted more which may be influencing the households (consumers) of this area differently than those who did not face terrorism in their cities. To capture this impact (long-term impact), I have created a new variable showing the historical trend of attacks for each city. Out of 59 cities of Pakistan, there are 31 cities which have been attacked at least one time during the last 17 years. Table 3 provides detail of cities which have faced massive terrorist attacks. These cities are located in different areas of Pakistan reflecting that there is no specific area of terrorist attacks.

[3] Terrorist attack in this study only includes the suicide bombing.
[4] http://www.satp.org/datasheet-terrorist-attack/pakistan. Accessed on 10 June 2021.

Table 3
History of Terrorist Attacks From 2001-2021

City	No. of Incidents	No. of Victims
Peshawar	79	3436
FATA	75	2684
Bannu & Hangu	54	1772
Quetta	27	1884
Karachi	26	1840
DIK	26	968
Swat	22	787
Lahore	21	2825
Islamabad	17	897

Source. Ministry of Information

Summary statistics related to terrorism and consumer sentiment for cities that were targeted and for cities that were not targeted during 2017-2021 are given in Table 4 and Table 5 respectively. It is quite evident from Table 4 and Table 5 that the cities which faced terrorism during 2017 tend to have pessimistic (lower) sentiment on average compared to cities which did not face terrorism during 2017-2021. Summary statistics of control variables such as education level, income level and average HH size of the city are quite familiar indicating that dynamics are more or less the same. Standard deviation of consumer sentiment index in the targeted area is higher than that of untargeted areas suggesting that terrorism does influence the sentiment.

Table 4
Summary Statistics (Terrorism and Consumer Sentiment in Targeted Cities)

Variable	**Mean**	**Min**	**Max**	**S.D**
Consumer Sentiment Index	48	47.2	49.8	0.72
No. of Victims in each city	43	1	431	80.28
Education level of city (avg)	Graduate	Primary	Post Graduate	-
Average HH size of city	7	6	14	1.2
Income level of city (avg per month)	300-500$	100-200$	1000-2000$	-
History of Terrorist Attacks in each city	25	0	83	27.4
History of Total Victims in each city	1253	0	3483	1239.8

Source. Analyst's Calculations

Table 5
Summary Statistics (Terrorism and Consumer Sentiment in Untargeted Cities)

Variable	Mean	Min	Max	S.D
Consumer Sentiment Index	49.1	47.1	51	0.6
No. of Victims in each city	0	0	0	-
Education level of city (avg)	High school	Primary	Post Graduate	-
Average HH size of city	7	4	12	1.1
Income level of city (avg per month)	300-500$	100-200$	1000-2000$	-
History of Terrorist Attacks in each city	6	0	84	12.8
History of Total Victims in each city	245	0	3489	578.3

Source. Analyst's Calculations

Estimation Strategy

Most of the previous studies which estimated the impact of terrorism relied on time series data and employed autoregressive distributive lag model to find out the relationship between terrorism and their variable of interests. These studies also used Granger causality to check the direction and nature of the relationships between terrorism and other variables. However, in this study, econometric analysis starts with basic panel model(s) using 59 cities and 36 time periods (bi-monthly) with city-fixed effect.[5] Panel variable is city and it is strongly balanced implying that 59 cities have data for all 36 time periods. Panel data allows one to control variables one cannot observe or measure like cultural factors across cities; or variables that change over time but not across cities (i.e. national policies, federal regulations, international agreements, etc.).

City fixed effects explores the relationship between explanatory and dependent variables within an entity (country, city, person, company, etc.). In my study, each city has its own individual characteristics that may or may not influence the independent variable i.e., terrorism. By using city-fixed effect, one assumes that something within the city may impact or bias the independent variable, which needs to be controlled. This is the logic behind the assumption of the correlation between entity's (city's) error term and explanatory variable. Fixed effect removes the effect of those time-invariant characteristics so one can assess the net effect of the explanatory variables on the variable of interest. Another important assumption of the fixed effect model is that those time-invariant characteristics are unique to the cities and should not be correlated with other cities characteristics. Each city is different therefore the city's error term and the constant (which captures cities characteristics) should not be correlated with the others.

In specification (1), consumer sentiment is the dependent variable; terrorism is the main independent variable. Terrorism in this model reflects the intensity of an attack i.e. total no. of victims (killed or injured). As mentioned earlier, city-fixed effects is employed in this specification. This specification is used to see the impact of the intensity of an attack.

[5] Panel data (also known as longitudinal or cross-sectional time-series data) is a dataset in which the behavior of entities are observed across time.

$$CS_{it} = \beta_0 + \beta_1 Terrorism_{it} + \alpha_i + u_{it} \quad (1)$$

CS = Consumer Sentiment measured by diffusion index
Terrorism = No. of victims (killed or severely injured)
α_i = city fixed effects
I = 59 cities
t = 36

In specification (2), there is only modification from specification (1) i.e. terrorism is used as a binary variable i.e. terrorism = 1 if a city faced an attack. This specification is utilized to see that occurrence of an attack in city irrespective of its intensity impacts sentiment or not.

$$CS_{it} = \beta_0 + \beta_1 Terrorism_{it} + \alpha_i + u_{it} \quad (2)$$

In addition, I use control variables like household characteristics (average at city level) for robustness check in specification (3). Education implies the average level of education of a city, income implies the average level of income of a city and HH means the total number of people living in a house on average in a city.

$$CS_{it} = \beta_0 + \beta_1 Terrorism_{it} + \beta_2 Education_{it} + \beta_3 HH_{it} + \beta_4 Income_{it} + \alpha_i + u_{it} \quad (3)$$

For robustness purpose, time fixed effect has also been included in the above specification. Moreover, previous consumer sentiment has also been used as one of the control variables to check whether lagged sentiment influences the current consumer sentiment or not. In addition, dynamic panel model (Arellano Bond Estimator) is also used to analyze whether previous sentiments impact current sentiments or not. The details of Arellano Bond estimator and relevant results are given in **Appendix**.

One may argue that perhaps there is an element of reverse causality i.e., weak consumer sentiment promote or impact terrorism itself. To check the presence of reverse causality i.e., whether terrorism itself is impacted by consumer sentiment, dependent and independent variables are switched to analyze whether current and lag variables of consumer sentiment impact or promote terrorism or not.

It is pertinent to mention here that in all specifications, clustered (by city) standard errors are used. Clustered standard errors are not underestimated like normal or robust standard errors. It is imperative to use clustered standard errors if there are several different covariance structures within the data sample that vary by a certain characteristic – a "cluster" which in this study is city. Clustered standard errors provide unbiased standard errors estimates.

Regression Results

Table 6 shows results of four different specifications (basic model and robustness checks) used to gauge the impact of terrorism on consumer sentiment. In Table 6, terrorism is used as a variable to indicate the intensity of the attack i.e. number of people killed or injured during an incident at a particular city. Although the sign (direction) of the coefficient is negative in all specifications implying that terrorism has a negative impact on consumer sentiment; the coefficient of terrorism is statistically insignificant.

Table 6
Impact of Terrorism on Consumer Sentiment

	(1)	(2)	(3)	(4)
Intensity of Terrorism[a]	-0.0008	-0.0008	-0.0012	-0.0011
	(0.0010)	*(0.0010)*	*(0.0010)*	*(0.0008)*
Level of Education (Avg of City)		0.0556	0.0456	0.0078
		(0.0904)	*(0.0866)*	*(0.0876)*
Members in a House (Avg. of City)		-0.164***	-0.157***	-0.122**
		(0.0464)	*(0.0463)*	*(0.0472)*
Level of Income (Avg of City)		0.0522	0.0680	0.0860
		(0.0589)	*(0.0572)*	*(0.0611)*
History (No. of attacks previously)			-0.1790	
			(0.1130)	
City Fixed Effect	***Yes***	***Yes***	***Yes***	***Yes***
Time Fixed Effect	No	No	No	***Yes***
Observations	2,124	2,124	2,124	2,124
R-squared	0.001	0.072	0.091	0.150
Number of cities	59	59	59	59

Notes. Clustered (by city) standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
a: Intensity of terrorism implies the total number of people killed or injured during an attack.
Consumer sentiment calculated through Diffusion Index is dependent variable in all specifications

In Table 7, terrorism is used as a dummy variable i.e. = 1 if city faced an attack. In this table, the coefficient of terrorism is again negative in all specifications which makes sense intuitively. Interestingly, the coefficient of terrorism is now statistically significant at 5% level of significance in the first four columns of Table 7, which implies that occurrence of a terrorist attack in a city matters irrespective of how intense the terrorist attack is. This number(terrorism) is approximately equal to one-half standard deviation of the dependent variable (consumer sentiment measured by the diffusion index), which implies that a considerable amount of variation in consumer sentiment (diffusion index) is influenced by terrorism.

Table 7
Impact of Terrorism (Binary Variable) on Consumer Sentiment

	(1)	(2)	(3)	(4)	(5)
Terrorism (Binary Variable)[a]	-0.37**	-0.347**	-0.402**	-0.400**	-0.341*
	(0.17)	*(0.16)*	*(0.16)*	*(0.18)*	*(0.18)*
Level of Education (Avg of City)		0.0332	0.0181	0.0526	0.0383
		(0.09)	*(0.09)*	*(0.10)*	*(0.10)*
Members in a House (Avg. of City)		-0.163***	-0.155***	-0.155***	-0.136***
		(0.04)	*(0.04)*	*(0.05)*	*(0.05)*
Level of Income (Avg of City)		0.0555	0.0751	0.0514	0.0587
		(0.06)	*(0.05)*	*(0.06)*	*(0.06)*
History (No. of attacks previously)			-0.200*	-0.182	-0.0361
			(0.11)	*(0.13)*	*(0.14)*
Lag of Sentiment				-0.051	-0.114
				(0.08)	*(0.07)*
City Fixed Effect	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***
Time Fixed Effect	No	No	No	No	***Yes***
R-squared	0.023	0.091	0.114	0.102	0.151
Number of cities	59	59	59	59	59

Notes. Clustered (by city) standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
a: Terrorism is used as a binary variable which is equal to 1 if city faced an attack.

In column (2) of Table 7, a number of control variables are added for robustness purpose. Socio-economic variables such average education level of the city, average income level of the city, and the average household size in a city. These control variables (HH characteristics within a city) have important economic intuition. The results show that higher the level of income and higher the level of education; sentiment are relatively positive. However, the coefficient of both these two variables are not statistically significant. The third control variable is the average household size, i.e. total number of people within a house. The coefficient of this variable is negative, and it is also statistically significant. This implies that if there are more people in the house, the household head (respondent) is more worried (negative sentiment) about the overall economic and financial situation. Even by adding these three control variables, the coefficient of our main independent variable (terrorism) is statistically significant. Regarding the size of the coefficient, this number(terrorism) is still equal to one-half standard deviation of the dependent variable (consumer sentiment).

In the last three columns of Table 7, additional control variable and time dummy variable have also been included; the result of this specification still keeps our main variable of interest (terrorism) significant. Hence, all specifications are consistent, and we reject our null hypothesis that terrorism has no impact on consumer sentiment. Results validate the hypothesis that cities which face an attack (occurrence of a terrorist activity in a city) tend to have more pessimistic sentiment. In columns 4-5, lag value of dependent variable (previous sentiment) is also used as a predictor for the current value of the dependent variable (current sentiment); results indicate that previous sentiment does not impact the current sentiment.

It is natural to argue that perhaps weak or pessimistic consumer sentiment itself promote and trigger terrorism. To check this claim, in Table 8, dependent variable (consumer sentiment) and independent variable (terrorism) have been switched and lags of consumer sentiment has been created to estimate whether present or past (lagged) consumer sentiment impact or promote terrorism or not? All columns in Table 8 using different number of lags and control variables confirm that there is no indication of reverse causality i.e. consumer sentiments do not impact terrorism. Firstly, almost all coefficients are statistically insignificant. Secondly, most coefficients have a positive sign which does not make logic because if consumer sentiment increase (improves) then terrorism should decrease. Hence it can be inferred that consumer sentiment (current or lagged) do not affect terrorism or promote terrorism. This result is consistent in all specifications.

Table 8
(Reverse Causality) Impact of Consumer Sentiment on Terrorism[a]

	(1)	(2)	(3)	(4)	(5)
Current consumer sentiment	0.00072	0.027	0.0736	0.0237	0.051
	(0.03)	*(0.03)*	*(0.05)*	*(0.03)*	*(0.05)*
Two months old sentiment	-0.00273	0.027	0.0793**	0.0243	0.0615
	(0.02)	*(0.03)*	*(0.04)*	*(0.03)*	*(0.04)*
Four months old sentiment		0.0589	0.0639	0.0481	0.024
		(0.04)	*(0.04)*	*(0.03)*	*(0.04)*
Six months old sentiment			0.0226		0.00533
			(0.03)		*(0.04)*
Level of Education (Avg of City)				-0.0129	0.0768
				(0.04)	*(0.05)*
Members in a House (Avg. of City)				-0.00671	-0.0303
				(0.02)	*(0.03)*
Level of Income (Avg of City)				0.00185	-0.0296
				(0.03)	*(0.03)*
History (No. of attacks previously)				-0.0688	-0.155
				(0.06)	*(0.09)*
Lags of control variables					
City fixed effect	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***
R-squared	0.000	0.020	0.046	0.031	0.130
Number of cities	59	59	59	59	59

Notes. Clustered (by city) standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
a: Reverse causality; dependent and independent variables have been switched to see the impact of consumer sentiment on terrorism.
Terrorism (binary variable) is the main dependent variable in all specifications.

Table 9
Summary of Results Related to Consumer Sentiment

	Statistical Significance of the Coefficient[a]	Economics Sense/Intuition	Size of the Coefficient
Impact of Intensity Terrorism on Consumer Sentiment	-0.001 implying that the diffusion index decreases by 0.001 points if the number of victims increase by one person. The coefficient is insignificant.	The coefficient has a negative sign which makes economic sense because consumer sentiment should decrease if there is terrorism.	The coefficient is small if compared with the standard deviation of the dependent variable i.e. diffusion index (consumer sentiment)
Impact of Terrorism (binary variable) on Consumer Sentiment	-0.35 implying that if a city faces an attack, diffusion index in that city decreases by 0.35 points. The coefficient is significant.	The coefficient has a negative sign which makes economic sense because consumer sentiment should decrease if there is terrorism.	The coefficient is big. The coefficient of terrorism is equal to one-half standard deviation of diffusion index.
Impact of Consumer Sentiment on Terrorism	0.005. This coefficient is statistically insignificant.	The coefficient has a positive sign which does not make sense because if consumer sentiments are improving then terrorism should not increase.	The coefficient is small if compared with the standard deviation of the dependent variable i.e. terrorism.

Notes. a: As a no. of specifications(s)has been used for estimations, in this table the average of all those coefficients is used.

Conclusion

Terrorism has been a persistent and intense issue for Pakistan since the events of 9/11 when Pakistan became a key ally of the US in the war against terrorism. Apart from monetary and human resource losses, this continuous and indiscriminate wave of terrorism has shaken the behavior of households in Pakistan as well. Primary schools, shopping malls, airports, cricket stadium, police check posts, hospital, army's head quarter, entertainment parks, shrines, praying areas, public rallies, bus and train stations have been attacked by the terrorist during the last 17 years.

This study by using panel model of 59 cities (covering all areas of Pakistan) and thirty-six time periods estimates the impact of terrorism on city level consumer sentiment. The main model (panel) with city fixed effects indicates that intensity of an attack does not matter statistically however the occurrence of an attack in a city has statistical significance i.e. cities which face an attack tend to have negative sentiment relative to cities which do not face an attack. Usually, when there is a news that a terrorist activity has occurred, panic triggers in the city. The intensity of an attack is secondary thing however the news of an attack triggers

the real panic and fear in the area where the incident took place. This result has been counter checked (robustness) by adding a number of control variables. In terms of the size of coefficient, the coefficient of terrorism is equal to one-half standard deviation of the diffusion index (consumer sentiment) which reflects that a considerable amount of deviation in sentiment is influenced by terrorism. To check the counter argument that perhaps weak socio-economic conditions and negative sentiment promote terrorism, dependent and independent variable are also swapped in this study. However, reverse causality test indicates that occurrence of terrorist activity is exogenous i.e., current, and past sentiment do not impact or promote terrorism.

Since the impact of terrorism is more significant at the affected cities, there is a need for a region-specific (city-specific) counter-terrorism policy instead of a generic national policy.

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Appendix

Arellano-Bond Estimator

In the Arellano–Bond method, first difference of the regression equation are taken to eliminate the fixed effects. Then, deeper lags of the dependent variable are used as instruments for differenced lags of the dependent variable (which are endogenous). Linear dynamic panel-data models include p lags of the dependent variable as covariates and contain unobserved panel-level effects, fixed or random. By construction, the unobserved panel-level effects are correlated with the lagged dependent variables, making standard estimators inconsistent. Arellano and Bond (1991) derived a consistent generalized method of moments (GMM) estimator for the parameters of this model. This estimator is designed for datasets with many panels and few periods, and it requires that there be no autocorrelation in the idiosyncratic errors.[6]

Table
Results of Arellano Bond Estimator

VARIABLES	(1)	(2)
Consumer Sentiments Two Months Ago	0.179	0.107
	(0.114)	*(0.164)*
Consumer Sentiments Four Months Ago		0.0404
		(0.121)
Terrorism	-0.267	-0.186
	(0.249)	*(0.263)*
Level of Education (Avg. of City)	-0.151**	-0.111
	(0.0616)	*(0.0797)*
Members in a House (Avg. of City)	-0.130	-0.0462
	(0.116)	*(0.150)*
Level of Income (Avg. of City)	-0.0300	0.00222
	(0.106)	*(0.118)*
History (No. of Attacks previously in each city)	42.59***	42.94***
	(6.027)	*(12.73)*
Observations	236	177
Number of cities	59	59

Clustered (by city) standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Arellano-Bond estimator has been run to see whether the value of dependent variable (previous sentiments) is a predictor for the current value of the dependent variable (current sentiments). Results in the table columns 1-2 (using different number of lags) indicate that previous sentiments do not impact the current sentiments. Post-estimation test for serial

[6] Information obtained from Stata Manual.

correlation is also conducted. If we follow the rule of p-value 0.05, then we reject no autocorrelation of order 1 and cannot reject no autocorrelation of order 2 which implies that Arellano-Bond criteria is satisfied.

Empowering PLWHA Through Microeconomic in Kendari City, Indonesia

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Abstract

This study examines the social and economic challenges faced by people living with HIV/AIDS (PLWHA) in Kendari City and evaluates the effectiveness of a community-based economic empowerment program. The research aims to assess how such programs can reduce stigma and improve economic independence. A qualitative methodology was employed, involving in-depth interviews, field observations, and document analysis with 23 participants, PLWHA, a local NGO, governments as program implementers, local religious and community leaders. Data analysis was conducted using NVivo, applying open coding, thematic categorization, and triangulation to ensure validity. The findings highlight that the empowerment program significantly improved participants' income and reduced social stigma, particularly through collaboration with religious leaders. However, challenges such as limited capital, lack of digital skills, and insufficient infrastructure remain. The study concludes that community-based approaches, combined with local values and cross-sector collaboration, can effectively empower PLWHA and reduce stigma, offering a replicable model for similar regions.

Keywords: economic empowerment, social stigma, HIV/AIDS

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Introduction

HIV/AIDS remains one of the pressing global health issues that continues to attract attention from various stakeholders, including governments, civil society organizations, and academics (Gómez, 2018). In Indonesia, this issue is not only associated with health but also intersects with social and economic dimensions (Rai et al., 2020). People living with HIV/AIDS (PLWHA) often face significant challenges, including stigma and discrimination rooted in prevailing social norms (UNAIDS, 2023). These challenges are further exacerbated in regions with strong cultural or religious norms, such as Kendari City in Southeast Sulawesi Province, where the majority of the population practices Islam (Arsyad et al., 2023).

In communities that uphold Islamic religious norms, HIV/AIDS is often linked to behaviors deemed morally deviant, such as drug use or extramarital sexual relationships (Masvawure & Foley, 2024). Consequently, PLWHA not only face stigma as individuals with a medical condition but also endure religiously motivated moral judgment (Fürj Kuhn, 2023). This stigma causes psychological harm and hinders PLWHA from accessing public services (Rzeszutek et al., 2021). Reports from PLWHA in Kendari indicate that 45% of them have experienced denial of healthcare services due to moral considerations (Kendari Health Department, 2023). This underscores the significant challenges in providing inclusive healthcare services in communities deeply rooted in religious norms (Tomkins et al., 2015).

Beyond health-related impacts, stigma and discrimination also adversely affect the economic conditions of PLWHA (Ezeja, 2024). Many face difficulties securing employment or starting businesses due to social exclusion and discrimination (Madanipour, 2015). This situation often traps PLWHA in a cycle of poverty, depriving them of opportunities to improve their quality of life (Watkins-Hayes, 2019). Data from the Kendari City Health Department in 2023 reveal that 65% of PLWHA reported experiencing discrimination in the form of denied healthcare services, job termination, or social exclusion (Kendari Health Department, 2023). These figures highlight the urgency of addressing the economic challenges faced by PLWHA to achieve greater independence (Jocelyn et al., 2024).

Previous studies have emphasized the importance of economic empowerment in addressing the challenges faced by PLWHA. For instance, research by Saeed and Ayuwat (2021) demonstrates that skills training and business capital support can help PLWHA create sustainable livelihoods. Similarly, Winskell et al. (2018) found that community-based interventions that consider local social norms effectively reduce stigma against PLWHA. On the other hand, Nyblade et al. (2021) highlight the importance of integrating economic empowerment programs with public education to reduce HIV/AIDS-related stigma and discrimination. However, many of these studies remain general and lack focus on the specific socio-cultural dynamics of regions such as Kendari.

In this context, community-based economic empowerment presents itself as a potential solution (Edwards, 2019). Economic empowerment programs can provide skills training, business mentoring, and initial capital support to help PLWHA create sustainable sources of livelihood (Kithuka, 2021). Several economic empowerment initiatives have been implemented in Kendari City, such as handicraft training and fish floss production. However, the success of these programs heavily relies on approaches that consider the religious and cultural norms of the local community. For example, collaborations with religious leaders to educate the public about the importance of supporting PLWHA have proven effective in reducing social stigma (Asrina et al., 2023).

Despite various initiatives, there remains a research gap that needs to be addressed. Specifically, there is a lack of studies that integrate community-based economic empowerment with approaches grounded in religious and cultural norms. Additionally, previous research tends to focus solely on economic impacts, without deeply analyzing the effects of such programs on reducing social stigma and increasing the independence of PLWHA.

This study is closely aligned with several Sustainable Development Goals (SDGs). Specifically, it contributes to SDG Goal 3 (Good Health and Well-being), which aims to ensure healthy lives and promote well-being for all at all ages (Howden-Chapman et al., 2017). It supports Target 3.3, which seeks to end the AIDS epidemic, and Target 3.8, which aims to achieve universal health coverage by ensuring better access to healthcare services for PLWHA. Additionally, this research is relevant to SDG Goal 10 (Reduced Inequalities), particularly Target 10.2, which promotes social and economic inclusion for all, and Target 10.3, which seeks to eliminate discrimination through equitable policies (Nunes et al., 2024). By focusing on the economic empowerment of PLWHA and reducing stigma, this study directly supports social, economic, and health inclusion for this vulnerable group.

This research aims to explore efforts to address the social and economic challenges faced by PLWHA in Kendari City through a community-based economic empowerment approach. The study focuses on exploring existing empowerment initiatives and analyzing their impacts, both on reducing the social stigma often associated with PLWHA and on improving their independence. Furthermore, it significantly contributes to the literature on PLWHA economic empowerment through a community-based approach, particularly in regions with strong religious norms.

Method

This study utilizes a qualitative methodology to attain a comprehensive understanding of the social and economic issues encountered by individuals living with HIV/AIDS (PLWHA) in Kendari City. The research, conducted in collaboration with YPKD, a local NGO dedicated to economic empowerment initiatives for PLWHA, sought to investigate the experiences, attitudes, and behaviors of PLWHA that are challenging to quantify. The study had 23 participants, including people living with HIV/AIDS engaged in a micro-enterprise initiative, program implementers from YPKD, and pertinent community and religious leaders. Informants were chosen through purposive sampling based on their direct involvement in the program. Data was gathered via comprehensive interviews, field observations, and document analysis, with the interviews examining themes such as personal experiences, problems, and societal attitudes, while field observations recorded business activity and program execution (Neuman, 2014). The gathered data was examined with NVivo software, employing open coding, thematic categorization, and triangulation to guarantee validity and consistency. Data validation was conducted by corroborating interview results with informants and engaging the YPKD team and community leaders in discussions regarding preliminary findings for input. This qualitative methodology offers significant insights into how community-based economic empowerment initiatives might tackle the obstacles encountered by PLWHA, with results that may guide analogous programs in different areas.

Result and Discussion

The community-based economic empowerment initiative executed in Kendari City has yielded substantial outcomes in mitigating the social and economic stigma encountered by individuals living with HIV/AIDS (PLWHA). The program's effectiveness has been attributed to an integrative approach that encompasses health, economic, and social dimensions, influenced by the region's robust Islamic religious values.

Integrating Community-Based Approaches to Address Social Stigma

Religious leaders and community figures play a pivotal role in fostering social acceptance of people living with HIV/AIDS (PLWHA). In an interview, R1 (a religious leader) stated, “We use Islamic values, such as compassion and care for others, to convey to the community that PLWHA are part of us and deserve support.” Educational efforts through religious sermons, study groups, and community dialogues have proven effective in changing public perceptions.

S1 (a representative of YPKD) also emphasized that collaboration with religious leaders accelerates the community’s acceptance process. “We involved religious leaders from the outset to ensure that messages about the importance of supporting PLWHA are well-received by the community,” said S1.

Q1, a participant in a fish floss home business initiative, shared her experience of initially facing severe stigma from her surroundings. “My neighbors avoided interacting with me because of my status. However, after seeing me start a fish floss business and hearing sermons from a local religious leader, they began to support my efforts,” she explained. This transformation highlights the critical role of engaging community leaders in educating and sensitizing the public.

Economic Approach to Reducing Dependency and Enhancing Independence

The empowerment program provides technical training and managerial support aimed at improving the economic independence of people living with HIV/AIDS (PLWHA). S1 explained, “We offer skills training such as producing fish floss and handicrafts, along with guidance on digital marketing to enable participants to sell their products more widely.”

Interview results indicate that 80% of program participants were able to increase their monthly income after completing the training. P2, one of the handicraft business participants, stated, “Before this program, I only worked irregularly without a stable income. Now, I can earn a steady income from my handicraft business.” Participants also learned to manage business finances, including bookkeeping and capital planning, which are essential foundations for the sustainability of their businesses.

However, there are differences in the economic impact experienced by participants in the handicraft and fish floss businesses. Participants in the fish floss business, such as Q3, reported that their products have a broader market appeal due to widespread consumption potential. “Fish floss has a large market, especially for consumers outside Kendari,” Q3 remarked. In contrast, handicraft business participants faced challenges in enhancing the marketability of their products in local markets. P6 explained, “Handicrafts require

innovative designs to attract consumers, which is a challenge due to limited materials and design training."

Strengthening Social Aspects through Productive Interaction

A community-based approach creates opportunities for people living with HIV/AIDS (PLWHA) to engage positively with society. Empowerment products, such as fish floss and handicrafts, are promoted through local bazaars and souvenir shops, allowing the public to recognize the tangible contributions of PLWHA. R2, a community leader, appreciated this effort, stating, "When the community sees the high-quality products created by PLWHA, they begin to understand that PLWHA are also capable of contributing to the community." This is reflected in the experience of Q3, who expressed feeling more valued when neighbors started purchasing their products and offering moral support.

Overall, the community-based economic empowerment program implemented in Kendari City has demonstrated significant positive impacts in addressing social stigma and enhancing the economic independence of PLWHA. Collaboration with religious leaders and local communities played a crucial role in changing societal perceptions through an approach rooted in values of compassion and inclusion.

On the economic side, technical and managerial training equipped PLWHA with the skills needed to run their businesses independently, while promotion through local bazaars and souvenir shops strengthened productive interactions with the community. Despite challenges, such as the need for innovative designs in handicrafts and market expansion for fish floss products, the program has proven that a holistic, community-based approach can be an effective model for empowering PLWHA. With sustained support and enhanced program innovation, similar successes can be replicated in other regions with comparable social and cultural characteristics.

Table 1
Summary of Findings

Main Themes	Findings	Supporting Quotes
Increase in Participants' Income	80% of participants reported an increase in income after the training.	"My income increased significantly after starting the fish floss business." - Q1
Impact of Fish Floss Business Training	Fish floss participants gained access to wider markets, especially outside Kendari City.	"My fish floss is highly sought after by consumers from outside the region." - Q3
Challenges in Handicrafts	Handicraft participants face challenges in design innovation and sourcing raw materials.	"It's hard to find high-quality raw materials to create attractive products." - P6
Changes in Community Perception	The community began to support PLWHA (People Living with HIV/AIDS) after seeing their tangible contributions through products.	"My neighbors started supporting the fish floss business after hearing the preacher's sermon." - Q1
Integration of Religious Values	Collaboration with religious leaders effectively reduced stigma and improved social acceptance.	"Islamic values such as compassion help educate the community." - R1 (Religious Leader)

Analysis of Community-Based Economic Empowerment Program for PLWHA

The community-based economic empowerment initiative executed in Kendari City by YPKDS has yielded beneficial effects in diminishing social stigma and augmenting the economic autonomy of individuals living with HIV/AIDS (PLWHA). The program employs a comprehensive strategy that includes skills training, provision of company finance, and facilitation of market access, integrating social, economic, and health components customized to the attributes of Kendari's primarily Muslim demographic. Community-oriented strategies and intersectoral collaboration have been essential pillars for promoting social acceptance of PLWHA. Nonetheless, the program encounters substantial problems that necessitate comprehensive mitigation techniques to guarantee its sustainability and scalability.

The primary obstacle encountered by PLWHA in this program is the enduring social stigma within the community. A significant number of Kendari inhabitants continue to connect HIV/AIDS with immoral conduct, including substance misuse and extramarital affairs. This stigma directly undermines the confidence of PLWHA, thus affecting their capacity to promote items and establish commercial networks. Several PLWHA indicated that, notwithstanding the guaranteed quality of their products, adverse community attitudes impede sales. This discrimination restricts PLWHA's access to economic possibilities and hinders their ability to obtain community support.

Beyond societal stigma, insufficient finance constitutes a substantial obstacle for PLWHA in expanding their enterprises. The initial funding supplied by the program is frequently adequate solely for initiating small-scale enterprises. Nonetheless, augmenting production capacity and satisfying increased market needs necessitate significant extra cash. Numerous PLWHA encounter difficulties in obtaining formal funding sources due to the absence of requisite official documentation, such as credit history or collateral, necessary for securing loans from banks or cooperatives. This limits their capacity to expand their enterprises efficiently.

The infrastructure conditions in Kendari provides a significant problem. Substandard road conditions in specific regions and insufficient transportation infrastructure complicate and elevate the costs of product delivery. These obstacles hinder PLWHA's capacity to access markets beyond the region, diminishing the competitiveness of their products in regional markets. Insufficient infrastructure also obstructs PLWHA from engaging in bazaars or shows beyond their locality, which could otherwise offer substantial chances for product promotion.

The deficiency of digital skills further impedes PLWHA in an age where digital marketing serves as a principal avenue for accessing wider markets. Numerous individuals living with HIV/AIDS lack fundamental competencies in employing social media or e-commerce platforms such as Shopee or Tokopedia. This constraint confines their product marketing reach, rendering them increasingly dependent on direct sales in local marketplaces, which are restricted in scale and breadth.

To tackle these problems, the curriculum should initiate comprehensive digital marketing training that encompasses the management of business accounts on social media and e-commerce platforms. Individuals living with HIV/AIDS can acquire skills in producing compelling visual material, managing digital product catalogs, and addressing customer concerns with professionalism. Supplementary assistance, including the creation of robust

product branding via appealing logo and packaging design, can augment the competitiveness of PLWHA's products in digital markets. Engagement with local influencers may enhance product visibility, while experienced technical advice might assist PLWHA in comprehending platform algorithms to optimize exposure.

Local government is essential in enhancing infrastructure to facilitate the distribution of products for people living with HIV/AIDS. Enhancing road infrastructure in producing zones and establishing logistical facilities, including storage and distribution centers, would improve market accessibility and preserve product quality. Transportation subsidies may be offered to mitigate logistical expenses, which have posed a considerable obstacle for PLWHA. Enhanced infrastructure would bolster the competitiveness of PLWHA products in both local and national markets.

The program might additionally utilize local economic potential as a supplementary resource. In Kendari, the utilization of marine resources, such as fish for fish floss manufacture, can be enhanced through the development of creative goods. Variants of fish floss featuring distinctive local flavors or diverse container sizes could appeal to a wider market sector, including export markets. Individuals living with HIV/AIDS involved in handicrafts could be directed to develop contemporary designs that correspond with market trends. Establishing innovative training centers equipped with technical expertise and high-quality production instruments could enhance their competitive capacity.

Long-term support necessitates alignment with more comprehensive public policy. Local governments could establish supportive ecosystems by enacting policies that prioritize the acquisition of goods and services from micro-enterprises owned by people living with HIV/AIDS. Collaborations with the private sector via CSR initiatives could yield supplementary funding and mentorship opportunities. The program could be enhanced by formulating a strategic roadmap that encompasses short-, medium-, and long-term objectives. This methodology guarantees that the program's effects are quantifiable, enduring, and comprehensive.

Duplicating this model in other regions with analogous social and cultural traits necessitates suitable modification to the local context. In regions with robust religious or cultural traditions, engaging religious and community leaders is crucial for public education and promoting social acceptability of PLWHA. HIV/AIDS education must fit with local values to foster an inclusive atmosphere that supports people living with HIV/AIDS. Moreover, skills training and business mentoring programs can be customized to the specific resources of the local region, including the use of unique natural assets.

Intersectoral engagement among governmental entities, local non-governmental organizations, and commercial stakeholders is essential for the successful replication of this model. Local governments can offer policy support, including tax advantages or subsidies for micro-enterprises owned by people living with HIV/AIDS. Local NGOs can provide training and technical mentorship, whilst corporate entities can provide market access for items aimed at people living with HIV/AIDS. A systematic assessment of the program's implementation in Kendari is essential as a realistic reference for other locations seeking to follow this approach.

Through these strategic measures, the community-based empowerment initiative for PLWHA can enhance its influence, not only in Kendari but also in additional regions. Emphasizing

digital marketing, enhancing infrastructure, and fostering cross-sector collaboration will generate novel economic prospects for PLWHA, while concurrently promoting social inclusion and eradicating stigma. This concept can provide a lasting solution for PLWHA to attain economic independence and improved welfare.

Conclusion

The community-based economic empowerment program in Kendari City has had a significant positive impact on PLWHA (People Living with HIV/AIDS), particularly in reducing social stigma and enhancing their economic independence. Through skills training, capital support, and collaboration with religious leaders and local communities, the program successfully integrated social, economic, and health aspects to create a more inclusive environment. However, challenges such as societal stigma, limited capital, lack of digital skills, and inadequate infrastructure remain obstacles that require further attention.

The success of this program highlights the importance of a holistic approach that combines local values with economic empowerment strategies. For the sustainability and replication of the program in other regions, emphasis on digital marketing, product innovation, infrastructure improvement, and cross-sector support from governments, NGOs, and the private sector is essential. With these strategic measures, this empowerment model can not only improve the welfare of PLWHA but also serve as a reference for similar initiatives in other regions with comparable social and cultural characteristics.

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Multicriteria Model for Choosing Maintenance Strategies in Water Softening and Water Production Systems for Domestic Use

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Abstract

Hospitals consume more water than other organisations since, in addition to human consumption, healthcare environments require a high level of hygiene and cleanliness. In some cases, moreover, the water must be pure, or have special characteristics, in order for healthcare services such as haemodialysis and therapeutic pools. In addition, high water consumption implies significant energy consumption and a significant amount of hazardous waste produced. Healthcare centres must reduce water consumption, as required by Goal 6 of the Sustainable Development Goals (SDG) of the 2030 Agenda. One of the aspects that can contribute is to provide optimal maintenance of the facilities. However, there is a significant lack of objective mathematical models allowing the selection of the most appropriate maintenance strategies to be applied in systems involved in the softening and production of domestic water. Therefore, this contribution sets out a model agreed upon by a number of hospital service managers, developed using the Measuring Attractiveness by a Categorical Based Evaluation Technique (MACBETH), to select the optimal combination of maintenance strategies to be applied in a public university hospital. The results of the model have allowed us to objectively determine the validity or need for updating of the maintenance strategies applied, analysing the effects that the proposed changes would have on the quality of care.

Keywords: maintenance strategies, multi-criteria techniques, health-care organisation, MACBETH

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Introduction

The water that arrives at a hospital, although suitable for human consumption, contains dissolved salts (chlorides, sulphates, calcium, etc.), which must be removed before it can be used in healthcare processes such as haemodialysis, therapeutic pools, laboratory analysis, etc., but also for routine processes such as cooking, laundry, or air conditioning. For example, the presence of contaminants in dialysis fluid can expose the patient to the risk of accumulating toxic substances that can interact with cells or proteins, triggering bioincompatibility and toxicity. Hot water is essential in hospitals, as its interruption can lead to the suspension of healthcare activities. However, it also entails significant energy consumption, accounting for 10 to 20% of a hospital's energy expenditure. Furthermore, maintaining the appropriate temperature is essential, as too low a temperature may not eliminate bacteria, and too high a temperature can pose a risk of burns. Although the water supplied to a hospital from the supply network is disinfected, the accumulation of water in tanks causes the gradual evaporation of chlorine, especially when temperatures rise. Therefore, facilities dedicated to producing domestic hot water require proper maintenance, including chlorination, to eliminate the bacteria that cause legionellosis. Thus, maintenance programs for domestic hot water facilities should include at least the following points (COIIM-AIIM, 2021):

- Prepare a marked and updated plan of each facility, showing its components. Critical points where water sampling will be performed must be indicated.
- Inspect all parts of the facility to ensure proper working, establishing critical points, parameters to be measured, procedures to be applied, and their frequency.
- Schedule water treatment to ensure quality, including products, dosages, and procedures, physical, chemical, and biological control parameters, measurement methods, and frequency of analysis.
- Schedule the cleaning and disinfection of the facility to ensure it operates safely, establishing the procedures, products to be used and dosages, precautions to be taken, and the frequency of each activity.
- Keep a facility maintenance log that includes incidents, activities performed, results obtained, and dates of technical shutdowns and restarts of the facility, including the reasons for them.

Therefore, carrying out quality maintenance in a hospital will influence the availability and quality of domestic water required in Hospitals which can affect care and non-care staff, patients, and their companions. Therefore, the application of a certain combination of maintenance strategies in a hospital, influence its quality of care.

The choice of maintenance strategies is a complex decision as it involves strategic, economic, environmental, technical, and safety issues. Therefore, the use of Multi-Criteria Decision Analysis (MCDA) techniques is considered highly appropriate. Furthermore, they allow for obtaining results based on an objective mathematical model, in which a number of stakeholders or decision makers can participate, issuing judgements to ensure optimal decisions when public expenditure is involved.

The existing literature on the selection of maintenance strategies using MCDA techniques in the healthcare field is very limited, although the contribution of Taghipour et al. (2011) stands out. They use the Analytic Hierarchy Process (AHP) to prioritise medical devices according to their criticality, and select the ideal maintenance strategy for different device classes. Houria et al. (2017) prioritise medical equipment according to their criticality using

fuzzy AHP to weight the decision-making criteria and the fuzzy Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) to select the most suitable maintenance strategy. In the research of Jamshidi et al. (2015), an additive weighting model integrated with fuzzy Failure Mode and Effect Analysis (FMEA) has been used to obtain a prioritisation of medical devices; AHP allows the weights of the criteria and a maintenance-planning diagram to be obtained, in order to assign a maintenance strategy to each medical device. Mahfoud et al. (2016) integrated the Preference Ranking Organization Method for Enrichment of Evaluations (PROMETHEE) and AHP to carry out a decision support system for medical device ranking using a decision-making group of medical experts. Carnero and Gómez (2016) utilize the Measuring Attractiveness by a Categorical Based Evaluation Technique (MACBETH) approach to construct a methodology for the selection of integrated maintenance strategies and back-up devices in dialysis devices related with acute or chronic patients and, those infected with hepatitis B or C. Houria et al. (2017) combined the most applied MCDA techniques in literature, that is, AHP and TOPSIS to rank maintenance policies and mixed integer techniques to choose the most suitable strategies for each medical device. Ighravwe and Oke (2019) applied Stepwise Weight Assessment Ratio Analysis (SWARA), Weighted Additive Sum Product Assessment (WASPAS), Fuzzy Axiomatic Design (FAD), and Additive Ratio Assessment (ARAS) to select the best maintenance strategy in public buildings, such as hospitals (Carnero & Gómez, 2021).

Most previous research selects a single maintenance policy, but fails to consider that an organisation typically uses several maintenance strategies, combined in different percentages. It is therefore necessary to decide the best integration of strategies to carry out. Furthermore, they are never applied to a hospital's domestic water production and storage facilities.

This contribution presents a multicriteria model that integrates continuous-time Markov Chains with the multicriteria Measuring Attractiveness by a Categorical Based Evaluation Technique (MACBETH) to undertake the choice of the ideal combination of maintenance strategies in two domestic water production and storage systems of a health care organization.

The layout of this contribution is as follows: first, the main features of the MACBETH approach are described; the following section exposes the decision support model for choosing maintenance strategies, including the structuring process, weighting, definition of alternatives, and the results of applying the model to a domestic water production system and another hot water production and storage model. The conclusions and finally the bibliography section are presented below.

Measuring Attractiveness by a Categorical Based Evaluation Technique (MACBETH) Approach

MACBETH was developed by Bana e Costa and Vansnick (1997) and has been applied to numerous decision-making problems (see, for example, Gokasar et al., 2023; Mishra & Syed, 2025; Singh, 2024).

MACBETH has numerous advantages over other MCDA techniques, including (Bana e Costa et al., 2003; Carnero & Gómez, 2018):

- It is easy to implement.
- It can be applied using the M-MACBETH software, which also allows for the analysis of the model's robustness and sensitivity.

- It can verify the consistency of the judgements made by decision makers and resolve any inconsistencies detected.
- Its application simply needs to compare pair of criteria or pairs of scale levels for each descriptor qualitative judgements related to the change in performance between each one.
- In making each judgement, a range of semantic categories instead of just one can be associated with the difference in performance, which allows for the inclusion of uncertainty in the decision.
- The use of two reference levels for each descriptor allows for more accurately generated value functions.
- It avoids the difficulties inherent in ordinal aggregation (Arrow's theorem, Condorcet's paradox).

Furthermore, MACBETH can handle models that include a large number of criteria, which can be both quantitative and qualitative.

MACBETH evaluates alternatives using an additive aggregation model as shown in Equation (1).

$$v(A) = \sum_{i=1}^{n} w_i v_i(A_i) \qquad \sum_{i=1}^{n} w_i = 1 \quad w_i > 0 \tag{1}$$

with v_i (most attractive impact level on criterion i) = 100 and v_i (least attractive impact level on criterion i) = 0, where A is the alternative evaluated, n is the number of criteria, w_i the weight of criterion i, A_i the value of the alternative in criterion i, $v_i(A_i)$ is the impact of alternative A on criterion i and $v(A)$ is the global value of alternative A.

The implementation of the MACBETH approach requires asking the experts to get the scales of performance v_i and weights w_i.

Multicriteria Model for Choosing Maintenance Strategies

The systems analysed were analysed applying continuous time Markov chains, returning the system of equations that allows computing the mean availability through the life cycle of each domestic water treatment system of the Healthcare Organisation.

Two systems were analysed. System 1 stores decalcified water generated by other systems and maintains in a range of $2\text{-}3\text{x}10^{-6}$ kg per litre of water, the value of free residual chlorine. System 2 produces and stores hot water at 60 Celsius degrees and, in pasteurisation process at 70 Celsius degrees, to remove legionella (Carnero & Gómez, 2018).

λ_1 and μ_1 are defined as the equivalent failure and repair rates respectively of System 1. Corresponding to the another System, λ_2 is associated to the failure rate and μ_2 to the repair rate related to the water production circuit, meanwhile λ_3 and μ_3 are associated to the failure and repair rates of the accumulation circuits. The results obtained for both systems in each possible maintenance strategy to be applied are shown in Table 1.

Table 1
Equivalent Failure and Repair Rates and Average Availability of Each System

System 1					
Alternatives	λ_1		μ_1		Mean availability
CM-MPM	0.001454		0.00995		0.9882
CM-DPM	0.001454		0.077		1
CM-CPM	0.001454		0.267		1
System 2					
Alternatives	λ_2	μ_2	λ_3	μ_3	Mean availability
CM-MPM	0.000577	0.016	0.000463	0.014	0.9980
CM-DPM	0.000577	0.021	0.000463	0.077	0.9999
CM-CPM	0.000577	0.041	0.000463	0.267	1

Structuring Process

The decision criteria chosen to build the model, and the scale levels of each descriptor associated with each criterion, including the reference levels good and neutral, are (Carnero & Gómez, 2018):

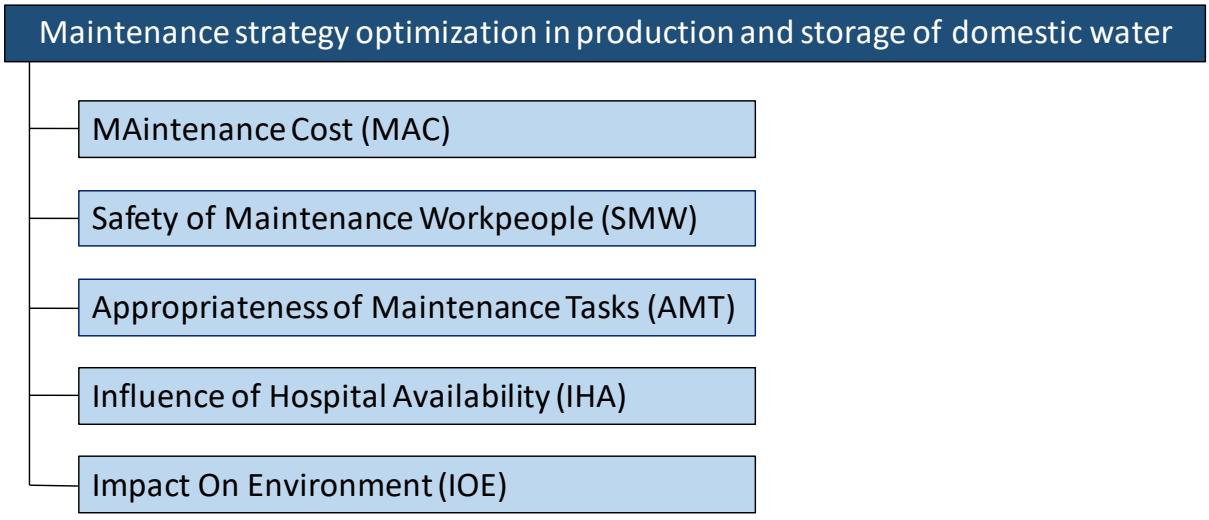
- MAintenance Cost (MAC): Evaluate annual maintenance costs, including those related to labor, materials, spare parts, and subcontracting activities (Gómez & Carnero, 2016).
    1. The best value of performance (good level): € 5,000.
    2. € 10,000.
    3. Neutral level of performance: € 20,000.
    4. € 30,000.
    5. The worst value of performance: € 40,000.
- Safety of Maintenance Workpeople (SMW): assesses the risk to which the technicians, and, in general, those who operate the subsystem directly, are exposed (Gómez & Carnero, 2016).
    1. The best value of performance (good level): There are no risks to the operator at any time.
    2. There is some potential risk, so the operator should take certain basic precautions during operation of the system.
    3. Neutral level of performance: There is a specific risk, so the operator must take certain basic precautions during the operation of the system.
    4. There is a specific risk, so the operator must take certain basic and specific precautions during the operation of the system.
    5. The worst value of performance: There is a specific risk, so the operator must take certain basic, specific and emergency precautions during the operation of the system.
- Appropriateness of Maintenance Tasks (AMT): considers the level of satisfaction of the maintenance workers (Gómez & Carnero, 2016).
    1. The best value of performance (good level): The maintenance worker is certain of the diagnoses of the anomalies and breakdowns analysed. Corrective activities should be programmed.
    2. The maintenance worker is certain of the diagnoses of the anomalies and breakdowns analysed, and corrective activities should be programmed.
    3. Neutral level of performance: The maintenance worker is certain of the diagnoses of the anomalies and breakdowns analysed, and corrective activities must be undertaken immediately.

4. The maintenance worker is not certain on specific occasions of the diagnoses of the anomalies and breakdowns analysed, asking his superiors to authorise immediate corrective activities.
5. The worst value of performance: The maintenance worker is not certain of the diagnoses of the anomalies and breakdowns analysed, and the corrective activities must be undertaken immediately.

- Influence on Hospital Availability (IHA): This criterion evaluates the influence that the loss of functionality of the analyzed systems has on the remaining systems of the hospital.
  1. The best value of performance (good level): 0.
  2. Neutral level of performance:(0, 50].
  3. (50, 100].
  4. (100, 200].
  5. The worst value of performance (200, 377.60].
- Influence On Environment (IOE):
  1. The best value of performance (good level): Does not inflict any kind of damage to the environment.
  2. May inflict slight damage to the environment although environmental standards are still being met.
  3. Neutral level of performance: May inflict damage on the environment, requiring corrective activities to minimize it.
  4. The worst value of performance: May inflict irreversible damage on the environment inside and outside the Healthcare Organization therefore, it is necessary to make the situation known to the authorities.

The hierarchy of the MCDA model proposed can be seen in Figure 1.

Figure 1
Hierarchy of the Model



Weighting Process

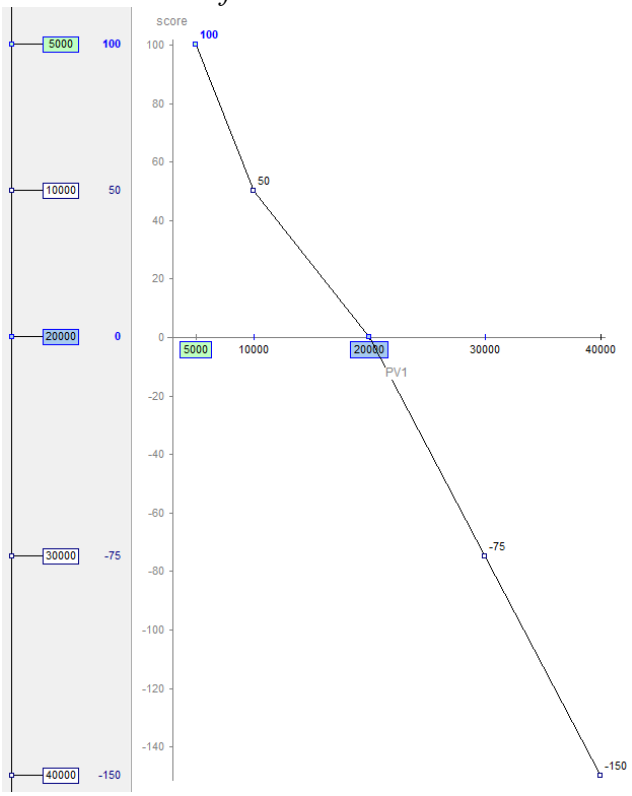
The MACBETH judgements matrix given by the decision group, by consensus, when comparing the different scale levels of the descriptor of criterion Maintenance Cost considering the semantic categories: No (N), Very Weak (VW), Weak (W), Moderate (M), Strong (S), Very Strong (VS) or Extreme (E) is shown in Table 2 and, the value function

obtained by linear programming using M-MACBETH for the same criterion in Figure 2, as an example.

Table 2
MACBETH Judgement Matrix Between the Scale Levels of the Criterion MAC

	1	2	3	4	5
1	N	W-M	M	M-S	S
2		N	W	M	S
3			N	M	M-S
4				N	M
5					N

Figure 2
Value Function of Criterion MAC



Bana e Costa and Chagas (2004) describe the procedure required to compute the weights of the criteria. By applying this procedure, the MACBETH judgement matrix was obtained between the decision criteria, as shown in Table 3. Finally, the weights w_i, w_{IAH} = 0.3636, w_{IOE} = 0.2727, w_{MAC} = 0.1818, w_{SMW} = 0.1364 and w_{SMA} = 0.0455 were obtained.

Table 3
MACBETH Judgement Matrix Between the Criteria

	IHA	IOE	MAC	SMW	SMA
IHA	N	W	W-M	M	M-S
IOE		N	W	W-M	M-S
MAC			N	VW-W	W-M
SMW				N	W
SMA					N

Alternatives

The viable alternatives to be applied in the systems analysed in the Healthcare Organisation are:

- Corrective Maintenance and Monthly Preventive Maintenance (CM-MPM).
- Corrective Maintenance and Daily Preventive Maintenance (CM-DPM).
- Corrective Maintenance and Continuous Preventive Maintenance (CM-CPM).

Results

The assessment of the alternatives in each of the criteria using the scale levels of each descriptor, and the overall scores obtained by the maintenance strategies in each System analysed, are shown in Table 4.

Table 4
Assessment of the Alternatives on the Criteria and Final Global Value

Alternatives	MAC	SMW	SMA	IOE	IHA	Global Score
System 1						
CM-MPM	2,880	3	3	2	8.82 (1)	43.34
CM-DPM	21,900	1	2	1	0 (0)	56.95
CM-CPM	35,000	1	0	0	0 (0)	54.55
System 2						
CM-MPM	2,880	2	2	2	0.4 (1)	74.47
CM-DPM	21,900	1	2	0	0.02 (1)	67.84
CM-CPM	35,000	1	0	0	0 (0)	54.55

Conclusion

The results obtained with the model suggest that the most appropriate option is to use CM-DPM in the System 1, and CM-MPM in the System 2. The advantages of the methodology proposed are (Carnero & Gómez, 2018):

- Ease of application, and therefore other health care organisations could use this methodology, after some adaptation.
- In the case of public organizations or companies, the use of a mathematical model in decision-making ensures that the expenditure of public funds is better justified in the eyes of the public.
- A decision-making group made up of various managers from different hospital areas provided the necessary judgments for the application of the model, with all decisions being reached by consensus.
- The MACBETH multicriteria technique facilitates including in the models the uncertainties, doubts or ambiguities of real decisions without having to use fuzzy MCDA techniques, which would be more complex to apply, and more difficult for the decision makers to understand.

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Using AI to Enhance English Writing Skills in Multilingual Transnational Higher Education

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Abstract

In multilingual transnational higher education, academic writing is a persistent challenge for many students, particularly in English-medium instruction (EMI) environments where linguistic and cultural diversity often amplifies barriers to success. Leveraging cooperative learning and generative Artificial Intelligence (GenAI) is vital to enhance the writing proficiency of undergraduate students in EMI contexts, bringing them on par with academic writing standards. The presentation explores a quasi-experimental mixed-method study addressing a significant technology-mediated language education gap in EMI settings. 100 undergraduate Chinese students aged 18-19 participated. The study combined cooperative learning strategies with GenAI tools for brainstorming, outlining, grammar, and vocabulary checks, using pre- and post-intervention assessments, observations, and engagement logs to show how these variables affect students' writing quality and engagement. The findings revealed a high correlation between the pre-post tests for overall writing quality at 0.707 ($p < 0.001$) and a t-value of -47.357 ($p < 0.001$), indicating substantial improvements in overall writing quality. The pre-test mean for engagement was 3.77 (SD = 1.004), while the post-test mean was 3.98 (SD = 0.864), indicating a modest increase in engagement over time. The improvements from pre- to post-intervention predict the benefit of using GenAI to improve coherence, grammar, vocabulary, and argumentation skills, revealing AI as a potential personalized writing tool for L2, enabling real-time feedback and fostering self-directed learning while alleviating common writing-related challenges of multilingual learners.

Keywords: cooperative learning, feedback mechanism, learning engagement, learning motivation, EFL students, generative AI

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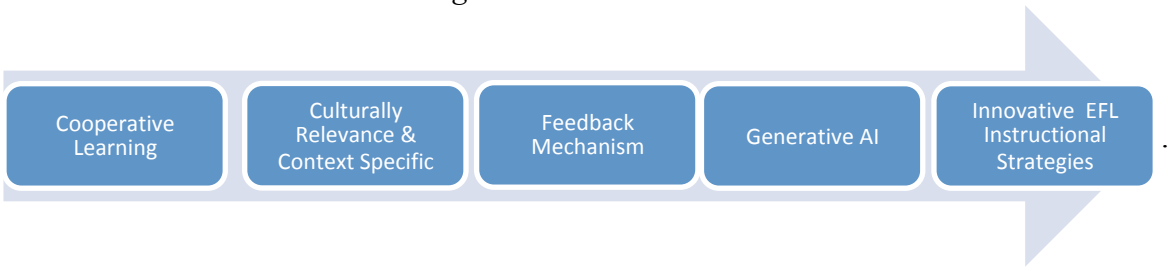
Introduction

Students in Chinese English-Medium Instruction (EMI) universities face considerable challenges in mastering academic writing, an essential skill for academic and professional success. As globalization reshapes Chinese higher education, the demand for English proficiency has intensified. However, academic writing remains a significant barrier for many English as a Foreign Language (EFL) learners (McKinley et al., 2021; Sang, 2017). Despite recent progress in English education in China, many students continue to struggle with fluency, clarity, and coherence in English writing. These challenges often restrict their participation in academic discourse and hinder their academic and career development (Liu & Wu, 2020; Marzuki et al., 2023).

This study explores alternative instructional support mechanisms for Chinese EFL students by examining the combined effects of cooperative learning strategies and Generative Artificial Intelligence (GenAI) tools. These innovative approaches aim to bridge the academic writing gap and foster greater writing proficiency among students. By enhancing students' abilities in grammar, structure, and clarity, such interventions can strengthen their academic performance and future opportunities in EMI environments. The complexity of academic writing in EMI contexts is heightened by linguistic barriers, cultural differences, and the need to conform to specific academic conventions. Students often struggle with syntax, vocabulary, discourse organization, and disciplinary writing norms, making targeted instructional support essential (Liu & Wu, 2020; McKinley et al., 2021). Additionally, the pressure to excel in EMI environments amplifies these challenges, emphasizing the need for culturally responsive and context-specific teaching strategies that empower EFL students. Collaborative learning has been shown to enhance language acquisition, particularly in settings where learners may face high levels of anxiety or unfamiliarity. Research highlights the value of student interaction, peer feedback, and shared learning experiences in improving both writing skills and learner engagement (Li & Lalani, 2020; Sang, 2017; Wang & Xie, 2017). However, despite growing interest in pedagogical innovation, the integration of advanced digital tools—especially GenAI—into EFL Instruction remains limited in Chinese EMI universities.

Figure 1
Innovative EFL Instructional Strategies



Purpose of the Study

The study makes a unique contribution to technology-enhanced language learning by addressing key gaps in current research. It investigates how combining cooperative learning with GenAI tools can address the specific writing challenges of EFL students in EMI settings. Prior studies have demonstrated the potential of technology to enhance language proficiency and engagement (Hill et al., 2023; Hong, 2023; Su et al., 2023; Tiandem-Adamou, 2024). However, this research goes further by examining how multiple strategies—peer

collaboration, AI-driven feedback, and traditional instruction—interact to improve writing outcomes. Moreover, the theoretical framework revisits constructivist learning theories in the context of AI-enhanced pedagogy, offering a revised model that integrates collaborative learning with GenAI technologies. This blended approach provides new insights into how learners construct knowledge through interactive and tech-mediated experiences. From a methodological standpoint, the study adopts a quasi-experimental design, comparing an experimental group using GenAI-supported instruction with a control group relying on traditional methods. It employs mixed-methods analysis, integrating quantitative data (such as writing scores and engagement metrics) with qualitative findings (like student perceptions of AI feedback). This robust design allows for a nuanced understanding of the intervention's effectiveness.

The technical innovation in this research lies in the integration of various AI platforms, such as ChatGPT, Grammarly, and Quillbot, for real-time feedback, and collaborative tools like Google Docs. Together, they form a hybrid feedback system that complements traditional teacher responses and enhances student learning. Unlike earlier studies that treat engagement as a single concept, this research dissects its components—peer collaboration, feedback participation, and AI interaction—to determine their individual effects on writing development. Ultimately, the study aims to produce adaptable and scalable instructional models for diverse educational contexts. It expands the dialogue on technology-enhanced writing instruction in EMI environments by addressing the following core questions: How do cooperative learning and GenAI affect ESL students' writing in terms of grammar, structure, and coherence? In what ways does GenAI enhance clarity and cohesion? How does it influence peer collaboration? And how do students perceive the integration of GenAI with cooperative learning in supporting their academic writing?

Method

This study employed a mixed-methods research design to examine the effectiveness of integrating Generative AI (GenAI) into cooperative learning activities for academic writing instruction in English-medium instruction (EMI) university settings in China. The combination of quantitative and qualitative approaches ensured a comprehensive and systematic evaluation of GenAI's impact on EFL (English as a Foreign Language) students' writing proficiency.

Participants

The participants consisted of 100 Chinese undergraduate students, with the majority (89%) aged 18–19 and the remainder aged 20–21. Students were randomly assigned to either an experimental group that used AI tools or a control group that did not, minimizing potential bias related to prior writing proficiency or familiarity with technology. Both groups were exposed to identical writing prompts, instructional materials, and learning goals. Lesson delivery was standardized through detailed lesson plans to ensure instructor consistency. Students in the experimental group received a structured orientation session to familiarize them with GenAI tools like ChatGPT, Quillbot, and Grammarly. This six-week quasi-experimental intervention integrated cooperative learning with rhetorical strategies and AI-assisted writing support. Each lesson progressively built upon the last, fostering an environment that emphasized collaboration, critical thinking, and technological fluency. The researcher observed student development in writing ability and confidence, reinforcing the importance of blending innovative technology with pedagogy in EMI contexts.

Data Collection and Analysis

Quantitative data were collected via pre- and post-intervention writing assessments, which measured overall writing quality, including grammar, vocabulary, coherence, and cohesion. Student engagement was also recorded through participation logs.

Analysis using SPSS revealed a significant improvement in writing proficiency among students in the experimental group. The mean writing quality increased from 1.98 (SD = 0.635) pre-intervention to 4.30 (SD = 0.644) post-intervention. Engagement levels also rose slightly over time, with means of 3.77 (SD = 1.004) and 3.98 (SD = 0.864) for the two observed dates, respectively. The findings revealed a high correlation between the pre-post tests for overall writing quality at 0.707 ($p < 0.001$) and a t-value of -47.357 ($p < 0.001$), indicating substantial improvements in overall writing quality. The pre-test mean for engagement was 3.77 (SD = 1.004), while the post-test mean was 3.98 (SD = 0.864), indicating a modest increase in engagement over time.

The improvements from pre- to post-intervention predict the benefit of using GenAI to improve coherence, grammar, vocabulary, and argumentation skills, revealing AI as a potential personalized writing tool for L2, enabling real-time feedback and fostering self-directed learning while alleviating common writing-related challenges multilingual learners face. These findings suggest that the integration of GenAI positively influenced both writing performance and student engagement.

Qualitative data was gathered through interviews and open-ended survey responses, and analyzed thematically using NVivo. The findings showed that most students perceived GenAI as highly beneficial for improving grammar, vocabulary, and writing structure. Many described GenAI tools as “useful” or “very useful,” with particular appreciation for their immediate and comprehensive feedback. Students noted that GenAI helped them identify grammatical issues and improve sentence structure, making it especially valuable during self-study or while drafting assignments.

However, students were also clear in expressing that AI feedback, while useful, could not replace the teacher or peer feedback. They valued the more personalized, explanatory nature of human feedback, which helped them understand writing conventions more deeply. Students emphasized that GenAI feedback tended to be more general and corrective, while teacher feedback was tailored, interpretive, and developmental. Additionally, students highlighted that GenAI increased their motivation to engage in writing. The real-time feedback made learning more interactive and encouraged them to revise their work proactively. Many said that GenAI helped them recognize weaknesses in their academic writing, pushing them toward continuous improvement. This supports the idea that AI tools can play a key role in increasing engagement and motivation in ESL learners. Participants also offered suggestions for future AI-supported instruction. They recommended that GenAI be used as an assistive tool rather than a replacement for writing tasks. Emphasis was placed on ethical use, guided by instructors, to avoid overreliance and plagiarism while enhancing writing competence. The consensus among students was that GenAI, when integrated thoughtfully, could complement traditional writing instruction and support language development effectively.

By triangulating quantitative and qualitative data, this study demonstrates that integrating GenAI into cooperative learning activities in EMI classrooms can significantly enhance ESL

students' writing proficiency and engagement. It also highlights the importance of maintaining a balance between AI-assisted learning and human-centered feedback to promote effective and ethical academic writing development.

The Scale

To ensure validity and reliability in this study investigating the impact of cooperative learning strategies integrated with GenAI tools (for brainstorming, outlining, grammar, and vocabulary support) on students' writing quality and engagement in EFL (English as a Foreign Language) classrooms, specific procedures were designed and implemented during both data collection and analysis phases.

Instrument validity included pre- and post-assessments. Writing tasks aligned with the course syllabus rubrics ensure content validity and represent authentic writing scenarios relevant to learners' levels. The use of validated rubrics measuring writing quality (e.g., idea organization, coherence, grammatical accuracy, lexical resource). Peer-reviewed or expert-validated rubrics increase construct validity. The engagement logs define engagement through observable behaviors (e.g., participation, tool usage frequency) and are triangulated with self-reports and observational data for criterion-related validity.

Cooperative learning was clearly operationalized (e.g., roles, group structures, task sharing) and GenAI tool usage (e.g., ChatGPT for idea generation, grammar correction), and the intervention was piloted to refine procedures and ensure that observed effects can be attributed to the intervention itself. Structured observation protocols with defined indicators of engagement were used (e.g., time-on-task, peer collaboration). Combine multiple data sources (writing samples, engagement logs, observations, surveys/interviews) to strengthen construct and ecological validity.

Reliability processes ensure that the measurement tools and procedures yield consistent results over time and across raters or instruments involved. Multiple raters evaluated pre- and post-intervention writing using a common rubric, rater training was offered, and a calibration session was conducted, using statistical measures like Cohen's kappa to assess consistency among raters. For engagement scales or surveys, Cronbach's alpha was used to check the reliability of items measuring the same construct. Standardized procedures for GenAI tool use were implemented (e.g., same prompt structures, same writing platform). Procedural fidelity checklists were used during sessions to ensure uniform implementation across groups or classrooms. Test-retest reliability was conducted where possible (e.g., conduct a follow-up writing task a few weeks later to assess skill retention).

Statistical analysis used paired-sample t-tests or ANCOVA to analyze differences in writing scores pre- and post-intervention, controlling for confounding variables. Thematic analysis or coding reliability for qualitative data (e.g., open-ended student reflections or observational notes). Blind raters to student identity and treatment group were performed, and mixed-methods triangulation was used to balance quantitative findings with qualitative insights.

Findings

The findings of the pre- and post-intervention writing assessment scores were examined to determine changes in students' writing skills from pre- to post-intervention, focusing on

coherence, cohesion, grammatical accuracy, vocabulary usage, and overall writing quality, as illustrated in Table 1.

Table 1
Pre-post Test Correlations

		N	Correlation	Sig.	t	Sig.(2-tailed)
Pair 1	Coherence (Pre) & Coherence (Post)	100	.881	< 0.001	-57.000	< 0.001
Pair 2	Cohesion (Pre) & Cohesion (Post)	100	.717	< 0.001	-35.913	< 0.001
Pair 3	Grammatical Accuracy (Pre) & Grammatical Accuracy (Post)	100	.385	< 0.001	-34.114	< 0.001
Pair 4	Vocabulary Usage (Pre) & Vocabulary Usage (Post)	100	.318	.001	-33.075	< 0.001
Pair 5	Overall Writing Quality (Pre) & Overall Writing Quality (Post)	100	.707	< 0.001	-47.357	< 0.001

Note. *p < .05, **p < .01

Table 1 above shows that the correlation between pre- and post-intervention coherence scores is 0.881 ($p < 0.001$), indicating a strong positive relationship. The significant t-value of -57.000 ($p < 0.001$) suggests a substantial improvement in coherence. The correlation for cohesion of 0.717 ($p < 0.001$) and a t-value of -35.913 ($p < 0.001$), cohesion also shows a statistically significant improvement. For Grammatical Accuracy: This skill has a moderate pre-post correlation of 0.385 ($p < 0.001$), with a considerable t-value of -34.114 ($p < 0.001$), indicating an increase in grammatical accuracy. For Vocabulary Usage: The correlation is 0.318 ($p = 0.001$) with a t-value of -33.075 ($p < 0.001$), suggesting significant vocabulary improvement. For Overall Writing Quality: The correlation of 0.707 ($p < 0.001$) and a t-value of -47.357 ($p < 0.001$) indicate substantial improvements in overall writing quality. The mean scores for each writing skill show marked improvements from pre- to post-intervention, supported by reduced standard deviations.

A correlation analysis in Table 2 examined relationships between students' overall engagement levels and writing quality before (pre) and after (post) the intervention.

Table 2
Overall Engagement Levels and Writing Quality (pre and post) Intervention

		Engagement Level 5/30	Writing Quality (Post)	Engagement Level 5/23	Writing Quality (Pre)
Overall Engagement Level 5/30	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	100			
Overall Writing Quality (Post)	Pearson Correlation	.084	1		
	Sig. (2-tailed)	.409			
	N	100	100		
Overall Engagement Level 5/23	Pearson Correlation	.728**	.077	1	
	Sig. (2-tailed)	.000	.449		
	N	100	100	100	
Overall Writing Quality (Pre)	Pearson Correlation	.128	.707**	.215*	1
	Sig. (2-tailed)	.204	.000	.032	
	N	100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 2 shows a weak positive correlation ($r = .084$) between overall engagement levels on May 30 and post-intervention writing quality. However, this correlation is insignificant ($p = .409$), indicating no meaningful relationship between later engagement and improved writing quality. A strong positive correlation ($r = .728$, $p < .01$) exists between overall engagement levels on May 23 and May 30, suggesting consistency in engagement levels over time. There is a significant, though moderate, positive correlation ($r = .215$, $p < .05$) between pre-intervention writing quality and engagement levels on May 23. This implies that higher initial writing quality may relate to higher engagement early in the study. A strong positive correlation ($r = .707$, $p < .01$) is observed between pre- and post-intervention writing quality, suggesting a significant association, likely indicating consistency in students' writing ability throughout the intervention. Overall, these results suggest that while engagement is relatively stable, its relationship to writing quality improvements is limited.

Discussion and Conclusion

The findings of this study reinforce the value of integrating Generative AI (GenAI) into cooperative learning to improve academic writing among Chinese EFL students in English-medium instruction (EMI) university settings. Both quantitative and qualitative results demonstrated substantial improvement in key writing skills—coherence, cohesion, grammatical accuracy, and vocabulary—when GenAI-supported instruction was implemented. These improvements support the anticipated benefits of GenAI integration, including increased writing proficiency, enhanced peer collaboration, and greater learning motivation

Students in the experimental group who utilized GenAI tools showed marked gains in writing quality, with statistical analyses revealing significant differences compared to the control group. Correlation and t-tests indicated that GenAI feedback, which provided timely, tailored suggestions, effectively addressed the linguistic challenges typical for Chinese EFL learners. However, the study also raised concerns regarding students' potential overdependence on AI

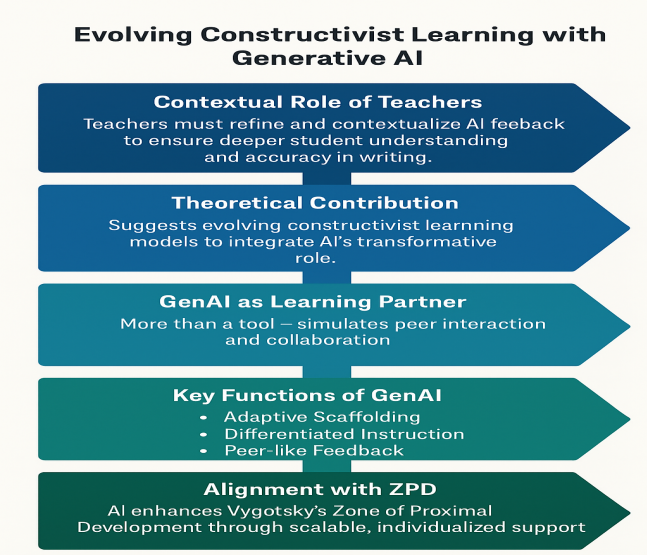
tools, which may hinder the development of critical thinking and autonomous writing skills. This highlights the need for a balanced instructional approach where AI serves as a support system, not a substitute for human instruction.

In addition, the comparative analysis between groups showed a strong correlation between GenAI use and post-intervention writing improvement. The experimental group significantly outperformed the control group in areas such as grammar, coherence, and argument development. These outcomes align with constructivist theories, suggesting that AI tools act as "scaffolding" mechanisms that support active learning by enabling students to revise and refine their writing with immediate feedback. GenAI's role thus expands the traditional understanding of constructivist learning by adding real-time, intelligent interaction into collaborative learning environments.

The collaborative writing component was equally crucial, promoting peer interaction, shared knowledge, and problem-solving. GenAI integration into cooperative tasks encouraged students to engage in peer review and group writing, which fostered inclusive learning environments. However, challenges such as uneven participation and group dynamics were noted. To address this, educators should establish clear roles, promote balanced collaboration, and monitor group interactions. One major advantage of GenAI noted in this study was its capacity to deliver personalized feedback, responding to students' linguistic and cultural learning needs. AI-driven error analysis and writing suggestions helped learners overcome common EFL hurdles and build writing confidence.

Nonetheless, AI's limitations—such as occasional inaccuracies and inability to understand cultural nuances—underline the need for teacher oversight. Teachers must contextualize and refine AI feedback to ensure it supports deeper understanding and accuracy in student writing. Hence, the study contributes to theoretical discussions by suggesting the need to evolve constructivist learning models to reflect AI's transformative role in education. GenAI can be viewed not just as a tool but as a collaborative learning partner. It simulates peer-like interactions, provides adaptive scaffolding, and facilitates differentiated instruction. This AI-enhanced learning environment aligns with and extends Vygotsky's Zone of Proximal Development by making individualized, scalable support possible.

Figure 2
Constructivist Learning With GenAI



Despite the promising results, the study acknowledged several limitations. The participant group, consisting solely of Chinese EFL students from one EMI university, limits generalizability. Moreover, while efforts were made to control for confounding variables, such as AI familiarity and instructor engagement, these could still influence outcomes. The preference for teacher feedback over AI-generated suggestions also points to the nuanced role AI must play—complementary but not a replacement for human input. Importantly, while engagement showed a modest increase, its direct impact on writing improvement was less clear. Future studies should explore specific engagement factors, like peer review or revision frequency, and how these relate to learning outcomes. Additionally, the long-term impacts of GenAI use remain unexplored, as this study focused only on short-term outcomes. Future research should include longitudinal studies, a broader participant base, and a deeper analysis of how specific GenAI features influence writing skills.

In conclusion, GenAI integration in foreign language learning shows considerable promise as an instructional tool in EFL academic writing, particularly when used within cooperative learning frameworks. By providing immediate feedback and supporting collaboration, GenAI enhances student engagement and writing proficiency. However, its integration must be balanced with ethical use, teacher guidance, and a focus on fostering independent learning to maximize educational benefits.

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Retail Security Guards Under Siege: Exploring Work-Related Violence Against Shopping Centre Security Guards in Gauteng, South Africa

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Abstract

Workplace violence has become problematic in the private security sector in South Africa, especially for security guards stationed at shopping centres. In this study, the nature and impact of workplace violence experienced by retail security guards in selected shopping centres in Gauteng were investigated. A qualitative research approach was employed to understand the lived experiences of security guards exposed to workplace violence at Gauteng shopping centres. The sample included 10 security guards: five were stationed at Maponya shopping centre, three at Hatfield shopping centre and two at Menlyn shopping centre. The sample comprised four female and six male security guards. The structural violence perspective was adopted to understand experiences of security guards exposed to workplace violence. Unstructured interviews of approximately 45 minutes each were conducted to collect research data. The findings revealed that retail shops such as Sportscene and Science Step are more likely to be targeted by criminals because they sell expensive brands, including Adidas and Nike. The various forms of crime that are often committed in retail spaces include armed robberies, shoplifting and targeting automated teller machines. However, the findings highlighted structural factors such as inadequate training of security guards to deal effectively with workplace violence. In conclusion, addressing work-related violence requires policy reforms aimed at protecting security guards against such violence.

Keywords: workplace violence, security guards, Gauteng shopping centres, structural violence

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Introduction

The aim of this study was to investigate violence retail security guards experience in the following shopping centres across Gauteng, South Africa: Maponya, Hatfield and Menlyn. Retail security guards are often the first line of defence and may find themselves under siege. Furthermore, they may be threatened and assaulted by customers. Therefore, the nature and causes of these threats in an endeavour to understand how violence affects the safety and psychological wellbeing of security guards were explored.

The private security industry is one of the fastest growing industries in South Africa and is considered to be one of the leading job creators in the country. According to Redaction Africanews (2024), South Africa has approximately 2.7 million registered private security officers, making the country's private security industry one of the largest security industries in the world. In South Africa, security guard services include unarmed guards, access control guards, event guards, retail guards, private guards and patrolling guards (Sys Control Secure, 2023). Despite the employment success of the private security industry in the country, Sefalafala and Webster (2013) noted that the industry is characterised by insecure employment, low wages, long working hours and a lack of social benefits. Furthermore, security guards feel stigmatized and lack social recognition (Sefalafala & Webster, 2013). Furthermore, Mbana et al. (2021) explained that in South Africa there is problem of poor training standards for the security guards and unqualified security training facilitators. This led to serious injuries and death. Retail security guards also suffer these poor working conditions and receive poor training. As a result, they become vulnerable to workplace violence.

Current State of Retail Security in Gauteng

Niekerk and Cloete (2020) noted that shopping centres contribute towards communities' social and economic wellbeing, implying that shopping centres are instrumental in creating job opportunities as shops employ people. Security guards are employed to provide security services to ensure the safety of customers. In addition, shopping centres may also be viewed as places for recreation, exercising and socializing (Niekerk & Cloete, 2020). Accordingly, shopping centres also create opportunities for networking and making friends because people from different walks of life can converge there. However, networking opportunities can be difficult when the retail security guards are attacked and fail to protect customers.

Retail security guards play a major role in ensuring customers' safety and security. They safeguard the valuable assets and infrastructure of shopping centres from damage. Retail security guards are stationed outside and inside retail stores to keep employees and customers safe (Sys Control Secure, 2023). These guards are usually unarmed but assisted by surveillance cameras installed in the shopping centre. However, they face numerous challenges that affect their safety and wellbeing, including being targeted by criminals during robberies and shoplifting incidents, physical assaults, and verbal abuse and intimidation from customers and criminals. One may deduce that retail security guards are under siege as they are exposed to work-related violence. The World Health Organization (2002) defines workplace violence as incidents where employees are abused, threatened and assaulted in circumstances related to their work. Terms such as discrimination, bullying and intimidation are also used in relation to workplace violence (Steinman, 2003). Arrive Alive (2020), for example, reported that a security guard was tragically shot and killed by unidentified

attackers at a shopping centre in KwaMashu, KwaZulu-Natal. The suspects fled the scene and took the guard's service firearm with them (Arrive Alive, 2020).

In this study, work-related violence of retail security guards was examined from a structural violence perspective. Therefore, systematic issues such as economic inequalities and social exclusion, which perpetuate the vulnerability of retail security guards to workplace violence, are highlighted. Webb (2019, p.53) defined structural violence as a "condition in which groups are harmed by general and persisting situations not of their own choosing; from which most have no real way of escaping. Great harm, including death, and limits on actualization potential are the results." Accordingly, problems shopping centre security guards experience are not self-created but are the consequences of inappropriate and ineffective socio-economic policies aimed at creating job opportunities for South Africans. Consequently, some people resort to crime and endanger retail security guards' lives.

Literature Review

Structural Violence Perspective

Johan Galtung, the Norwegian sociologist and peace researcher, introduced the concept of structural violence in *Violence, peace and peace research* (1969). According to Galtung, social structures such as economic, social and political systems systematically harm individuals by limiting their access to resources and opportunities. Unlike direct violence, structural violence is not visible. While a person (object) exposed to personal violence will see the violence and may complain about it, a person exposed to structural violence may not see it and thus, not complain about it. Therefore, structural violence is silent (Galtung, 1969).

In accordance with Galtung's theory of structural violence, workplace violence against retail security guards in Gauteng shopping centres is not related to individual acts of violence but rooted in structural violence. This implies that unemployment and poverty in South Africa may influence people to resort to crime and expose security guards to unsafe working environment such as shopping centres.

Work-Related Violence in Retail Settings

There has been a sharp increase in crimes at shopping centres in South Africa, specifically in the Gauteng province. Furthermore, Lutchminarain and Minnaar (2012) confirmed that there has been a drastic increase in the level of violence used in robberies at shopping centres across South Africa as noted in media reports. These criminal incidents at shopping centres are not only limited to the actual shopping area, but also include criminal activities that occur in the designated parking areas of shopping centres. Majadibodu (2025) noted that a security guard who was patrolling outside Jubilee shopping centre in Gauteng was confronted by criminals who robbed him of his firearm before robbing a security guard of his cellphone inside the shopping centre. Furthermore, it was alleged that the perpetrators also bombed five automated teller machines (ATMs) and broke into one of the shops where they also bombed the drop safe (Majadibodu, 2025). The security guards at the shopping centre were disarmed, which may have put their lives as well as those the customers at the shopping centre at risk. Furthermore, Jordaan (2019) reported that a security guard is in a critical condition after being shot at a shopping centre in Diepsloot, North of Johannesburg. It is important to consider various factors that may influence workplace violence at retail establishments.

South Africa is one of the most unequal societies in the world, which may be linked to poverty and violence. In relation to inequality, Aljazeera (2022) explained that South Africa ranks first among 164 countries, making it the most unequal country in the world. Thus, there is a wide gap between rich and poor. There is unequal access to education and healthcare. Consequently, this can be a risk factor of violence. Lamb and Warton (2025) stated that inequality is a fundamental risk factor for violence. In addition, conditions, which are associated with inequality, tend to increase risk of violence (Lamb & Warton, 2025). Moreover, Lamb and Warton argued that unemployment and poverty often contribute to feelings of stress, frustration and humiliation, which can lead to violent behaviour. Accordingly, socio-economic factors such as poverty and inequality alone may not cause violence at retail establishments but constitute part of the conditions that can lead to violence and affect security guards' wellbeing. It is imperative that employers consider socio-economic factors when designing policies related to security guards and customers.

Valuable goods in a retail establishment can attract potential violence. Grinavich (2023) noted that criminals often target valuable items such as smartphones, tablets, laptops and jewellery as these valuables are often small and easy to steal. For example, a security guard and civilian were shot and injured during a robbery at a jewellery store in Menlyn Park shopping centre (Bhengu, 2021). Jewellery stores are targeted because jewellery can be sold quickly, especially on the black market. However, this endangers retail security guards' lives because they need to protect jewellery stores. In addition, Grinavich (2023) argued that retail establishments such as restaurants and nightclubs that are open until late, are more likely to attract violence. Leino et al. (2010) stated that late working hours are associated with three forms of work-related violence, namely, verbal aggression, threats of assault and physical acts of violence. Security guards could have confrontations with perpetrators of violence at night, increasing the risk of violence. Other factors can also expose employees to workplace violence. Lee et al. (2014) claimed that part-time employees are more likely to suffer workplace violence than full-time employees. In comparison to the latter, the former are likely to have had no experience of dealing with workplace violence and therefore, are likely to have less training in how to deal with conflict and apply preventative measures of workplace violence.

In addition, Menendez (2012) stated that racial discrimination can trigger violence from employees and service users, thus implying that it may lead to a hostile work environment and trigger violent reactions. Furthermore, employees not trained to handle violence may be considered to be a risk factor for violence in the workplace (Runyan et al., 2005). Moreover, working long hours can lead to fatigue and less emotional control and management, which may be a high risk for workplace violence (Lee et al., 2014). All these noted factors can be considered as risk factors for workplace violence. Hence, an understanding thereof is crucial for improving safety and designing effective strategies to curb workplace violence at shopping centres.

Impact of Violence on Security Guards

Work-related violence affects retail security guards. According to the American Academy of Experts in Traumatic Stress (2025), people who suffer work-related stress such as violence are at risk for physical health problems such as bodily injuries, including bruises and bleeding injuries. Accordingly, the physical effects of workplace violence on retail security guards maybe significant due to the nature of their work environment. However, workplace violence can also affect employees' psychological wellbeing. Lim et al. (2022) argued that workplace

violence may lead to depression, anxiety, post-traumatic stress disorder, low self-esteem and concentration difficulties. Consequently, as retail security guards are often exposed to verbal abuse and assaults in the workplace, this may be detrimental to their self-esteem and increase their stress and anxiety.

Furthermore, workplace violence may also have an impact on job satisfaction, especially among frontline workers such as security guards. Jansen van Rensburg et al. (2023) asserted that workplace violence threatens job satisfaction and turnover in the industry, implying that when employees are no longer happy at work because of workplace violence, job satisfaction decreases, leading to an intention to resign. Workplace violence can create a fear-based work environment that may affect employees' overall job performance. The guards may become less focused and efficient in performing their duties. Chao et al. (2015) noted that workplace violence is considered a reason for reduction in employee performance. The stress experienced due to work-related violence may increase sick days and affect the service rendered by the organization.

Legal and Policy Framework

Although South Africans experience challenges associated with workplace violence, there are regulations in the country to address work-related violence. Even though these regulations may not be effective, they are implemented to protect workers against work-related violence. According to the Department of Employment and Labour (2020), the Employment Equity Act (EEA) is aimed at addressing all forms of harassment in the workplace, which may include physical force, threats and actual violence against another person in the workplace. This may result in social injustice, economic harm, injury, death and psychological harm (Department of Employment and Labour, 2020). Employees are accordingly within their rights to request the employer to implement provisions of the Employment Equity Act that deal with violence in the workplace. The latter provides guidelines on human resources policies, procedures and practices related to all forms of harassment in the workplace as well as appropriate procedures to deal with it and prevent its recurrence (Department of Employment and Labour, 2020).

Furthermore, the Occupational Health and Safety Act (OHS) mandates employers to provide a safe work environment for employees. This Act outlines the duties of employers and employees to design health and safety policies in the workplace (Safety Cloud, 2024). Employers are legally obligated to ensure the workplace is free from violence and to take appropriate action when incidents of violence occur.

Moreover, there is a need to implement policies to deal with workplace violence. Somani et al. (2021) suggested that strategies aimed at addressing workplace violence should be implemented at organizational and individual levels. It is imperative to ensure that employees are well trained to handle workplace violence. Moreover, at an organizational level, employers should take steps to address barriers of workplace violence incidents to understand, address and prevent workplace violence (Somani et al., 2021), suggesting that policies need to address different aspects of the problem. For example, an organization should ensure that employees exposed to violence have access to counselling and medical care. Employers identify potential violent incidents and protect the clients.

Methodology

The qualitative research approach was adopted by employing a case study design to investigate work-related violence against retail security guards in selected shopping centres in Gauteng. Purposive sampling was employed to select a sample of 10 retail security guards that had direct experience with violent incidents in the shopping centre at which they worked. Data were collected through unstructured interviews. The participants chose to be interviewed when they were not on duty and at their own residence. They were uncomfortable being interviewed at the workplace because they perceived this could lead to victimization and termination of employment. The participants each signed informed consent before the interviews to indicate their willingness to participate in the study. Each interview lasted approximately 45 minutes. Thematic analysis was employed to identify recurring patterns and themes related to the causes, nature and impact of workplace violence on retail security guards. Ethical approval was obtained from the College of Human Sciences Research Ethics Review Committee at the University of South Africa (240816-052).

Results

Three themes, which are subsequently presented, emerged from the thematic analysis.

Retailers at Risk: The Crime Factor

The types of retail shops that were more likely to be targeted by criminals across Gauteng shopping centres and endanger the lives of the security guards are highlighted in this theme. According to the participants, criminals target shops such as Sportscene and Science Step as they sell expensive brands such as Adidas and Nike. They are also shared that telecommunication companies such as Telkom and MTN are targeted. The criminals could attack three shops a week and some of the retail shops cannot detect if someone has a firearm. One participant explained,

> The criminals get inside the Telkom shop. They just take the staff inside the office. Then [they] take the cellphones. They did not shoot anyone. The cameras saw those people as customers and therefore was easy for them to rob the shop.

This statement suggests that the security guards may have been overpowered by these criminals because they managed to steal cellphones in their presence. It appears none of the criminals were arrested during the robbery at Telkom.

Prevalent Crimes in Shopping Centres

The participants shared a similar view about types of crime that are common in retail spaces, including shoplifting, armed robberies and criminals attacking ATMs. One participant remarked, “Someone steal a wine at Pick n Pay supermarket and we arrested him. Then we called the police. The shoplifting happens most on Fridays and Saturdays.” This suggests that shoplifting is not always linked to putting food on the table but having fun and drinking alcohol. The customer was caught stealing wine at a Pick n Pay supermarket. It appears as though shoplifters have specific days to steal from supermarkets, specifically Fridays and Saturdays. The reason thereof is unknown.

Furthermore, the participants shared that the jewellery shop was robbed. Four men entered the shop at approximately 9:00 am, took out their firearms and shot the shop's window. They left with necklaces and watches, including a Rolex. From this incident, one may deduce that retail security guards are under siege. Robbers are often armed with firearms and may not hesitate to use them on security guards and customers. As noted previously, retail security guards are not armed in South Africa, making it difficult for them to deal effectively with armed criminals that target shopping centres.

Fear of Violence

The participants also shared their fear of violence and believed it contributed to security guards' decision to resign and look for alternative employment. Customers often also threatened them with violence. Consequently, they felt unsafe and feared that their lives were in danger. One participant related that a customer thus threatened him, "I will get you when knock off." Another shared, "Sometimes you have the fear of meeting the perpetrator after work." Although security guards are regarded as the first line of defence at shopping centres, these statements suggest that they fear for their lives. They feel that the retail space is not safe for them to work at as security guards.

Discussion

Three themes related to workplace violence at selected shopping centres in Gauteng, namely, Maponya, Hatfield and Menlyn emerged from the interviews. First, retailers at risk of crime were those that sold high-value goods such as Sportscene and Science Step. Both sell expensive brand clothing such as Adidas and Nike. Telecommunication companies such as Telkom and MTN who sell expensive electronic gadgets, including mobile phones and tablets, were also targeted. According to the South African Police Service, an average of 189 mobile phones are stolen daily in South Africa. The criminals use various methods to steal mobile phones (Lancaster, 2023). In this study, the focus was on armed robbery as a method to steal mobile phones. One may deduce that criminals in South Africa find mobile phones attractive and thus, telecommunication companies are at risk. The security guards patrolling telecommunication companies may be targeted by these criminals because they are involved in preventing and apprehending them, which may lead to confrontation.

Second, the prevalence of crimes at shopping centres included shoplifting, armed robberies and attacking ATMs. The patterns may have varied across the centres. It is evident from this data that security guards are under siege as at some point they have to deal with armed robberies. Molosankwe (2025) noted that at Park Meadows shopping centre in Bedfordview in Gauteng, eight armed men shot and killed a security guard during a robbery before stealing an undisclosed amount of cash and cellphones. It appears that retail security guards in South Africa are facing an increased risk of violence at shopping centres. South Africa has a high rate of crime, which includes armed robberies, resulting in a challenging environment for security guards. Cowling (2024) explained that violent crime in South Africa reached shockingly high levels. The most violent crimes in South Africa comprise assault with intent to cause grieves bodily harm, aggravated robbery and murder (Cowling, 2024). In addition, Cowling (2024) stated that cities with the highest crime indexes in South Africa, as well as the African continent, include Pietermaritzburg, Pretoria and Johannesburg. Poverty and unemployment are some of the factors that contribute to violent crime in South Africa.

Finally, the security guards feared violence. Some of them had even considered resigning and looking for employment in other sectors. Nalla and Cobbina (2017) asserted that the high turnover rate in the private security industry is directly correlated with job satisfaction and a challenging working environment, which may include exposure to violence. Therefore, dealing with aggressive individuals and exposure to high calibre weapons may exacerbate security guards' fear of violence.

Retail security guards' experiences at the selected Gauteng shopping centres reflect forms of structural violence as they face high exposure to workplace violence while lacking adequate training, making them vulnerable to workplace violence and reinforcing systemic structural challenges in South Africa. These structural challenges include social and institutional conditions that result in the security guards not receiving adequate training to deal effectively with workplace violence at the shopping centres. Without targeted policy reforms and improved labour conditions, these challenges rooted in structural violence are likely to persist and affect retail security guards.

Conclusion

Workplace violence against retail security guards in Gauteng shopping centres remains a challenging issue. The findings in this study suggest that these guards are often exposed to armed robberies and shoplifting, which contributes to their fear of violence. On the contrary, security guards' persistent exposure to workplace violence reflects deeper structural violence in which guards operate in high-risk environments such as shopping centres. They are not well trained to deal with violent incidents. This demands institutional changes such as improved working conditions and policy changes that will ensure that security guards are well trained to manage work-related violence.

The implications of this study include the need for developing targeted workplace safety policies that deal with risks faced by security guards at Gauteng shopping centres. Furthermore, it is imperative to address broader socio-economic inequalities that render security guards vulnerable to violence. For instance, the high unemployment rate may lead to crime, which, in turn, endangers the lives of security guards at shopping centres because they have to protect shops targeted by criminals.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

ChatGPT was used for brainstorming ideas. It was not used for plagiarism. For instance, ChatGPT was used to identify the factors one should consider when dealing with structural violence that affect security guards. Once ChatGPT had identified these factors, the author verified the information by conducting a literature review.

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Probabilistic Thinking Framework in the Context of Indonesian Curriculum: A Literature Study

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Abstract

Probabilistic thinking is an approach to predicting the probability of a situation occurring that utilizes mathematical and logical tools. It is analogous to the ladder of inference, which involves the analysis of relevant prior information, observations, data selection, and reasonable assumptions to facilitate sound decision-making in an uncertain environment. This ability involves both formal and informal knowledge of uncertainty. Formal knowledge, which is acquired in an academic environment such as a school, is a significant component of probabilistic thinking. However, there is a paucity of consensus regarding the materials that build students' probabilistic thinking ability, hereafter referred to as the probabilistic thinking construct. This construct forms the basis for measuring students' thinking ability, termed the probabilistic framework. This research systematically synthesizes the extant literature on the subject. A comprehensive review of recent research reveals a large number of studies from which probabilistic thinking frameworks have been designed can be categorized into two groups based on geographical location: The United States and Australia. This literature study research synthesizes those findings, then adapts them to the content and characteristics of the curriculum in Indonesia, known as the Merdeka Curriculum. The analysis revealed three constructs that facilitate probabilistic thinking skills and align with the curriculum's demands: sample space, probability of an event, and probability comparison.

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Introduction

Uncertainty terms are frequently employed in the context of information acquisition, as evidenced by the utilisation of phrases such as “chance of rain, sunny, cloudy, and so on” by meteorologists, the prediction of the probability of surgical intervention by medical professionals, the estimation of the number of accident victims by age, and the assessment of cancer spread (Batanero et al., 2016). The employment of linguistic expressions such as “unlikely”, “possible”, “certain”, and others, in such contexts, serves to convey the degree of uncertainty prevailing in a given situation. According to the Organization for Economic Co-operation and Development (OECD) (Wijaya et al., 2021), uncertainty can be defined as “a phenomenon at the core of the mathematical analysis of many problem situations”. The ability to engage in probabilistic thinking plays an important role in situations where one faces a phenomenon that is not a definite occurrence, but is still a possibility, albeit a small probability of occurring (Fa’ani et al., 2016).

In the contemporary era, the ability to think probabilistically, to interpret and critically evaluate stochastic phenomena faced by humans in various contexts is considered not only important for scientists, but also for the general public (Gal, 2002). Furthermore, Rumsey (2002) and Utts (2003) posit that these competencies are indispensable for individuals to function as critical and informed citizens in contemporary society. The cultivation of these cognitive abilities is achieved through both formal and informal educational experiences that are related to uncertainty. Formal education is primarily acquired through institutional settings such as schools, while informal education is acquired through games and experiences in social life. In light of the significance attributed to uncertainty, the nation of Indonesia has incorporated uncertainty and randomness as a compulsory component of the curriculum for students, collectively termed “chance” within the domain of mathematics. Nevertheless, there remains considerable debate surrounding the selection of materials and concepts to “cultivate students” probabilistic thinking skills in various countries. This study was conducted to explore and summarise the constructs or concepts associated with probabilistic thinking, and further synthesise a framework adapted into the curriculum in Indonesia, namely the Merdeka Curriculum.

Method

A comprehensive search of the extant literature in mathematics and mathematics education was conducted using the Google Scholar database. The search strategy incorporated the terms “probabilistic thinking”, “probabilistic”, and “framework”. The search was conducted with the inclusion of articles published up to December 2023. Additionally, a manual search of the bibliographies of relevant articles was conducted. The selection criteria comprised articles written in English and indexed in Scopus, which investigated the probabilistic thinking of school students from primary school to university level.

Findings and Discussion

A thorough review of the extant literature was conducted, employing a range of criteria to identify the constructs or concepts underpinning probabilistic thinking. This review revealed a variety of opinions regarding the material constructs that build these abilities. These constructs were then linked to a framework identified using the SOLO taxonomy as a basis

for characterising the development of student thinking. The development of this framework was the work of two research groups; one based in the United States led by Graham Jones (Jones et al., 1997; Tarr & Jones, 1997) and the other in Australia led by Jane Watson (Watson & Caney, 2005; Watson et al., 1997; Watson & Moritz, 2003). The development and validation of this framework was achieved through research involving school-aged students, and it describes thinking that generally exhibits the concrete-symbolic mode as described in the SOLO taxonomy (see Table 1) (Chernoff & Sriraman, 2014).

Table 1
Synthesis of Characterizations Across Frameworks

Prestructural Probabilistic Thinking Student thinking is irrelevant, non-mathematical, or personalized.
Students exhibiting thinking at this level. . . • Have an intuitive understanding of randomness • Believe outcomes can be controlled or explained • Believe consecutive events are always related • Struggle creating complete sample spaces and distinguishing between fair and unfair situations • Use idiosyncratic thinking when making predictions
Unistructural Probabilistic Thinking Student thinking is quantitative and non-proportional.
Students exhibiting thinking at this level. . . • Have a tendency to revert to subjective probabilistic thinking • Have a qualitative view of randomness—"anything is possible" • Make predictions about most or least likely events using quantities • Create sample spaces for one-stage experiments and some two-stage experiments • Distinguish between fair and unfair situations • Compare probabilities • Determine conditional probabilities • Become aware that probabilities can change in consecutive events
Multistructural Probabilistic Thinking Student thinking is quantitative and proportional.
Students exhibiting thinking at this level. . . • Make use of ratios, counts, probabilities or odds in judging probabilistic situations • Create samples spaces for one-stage and two-stage experiments systematically • Provide examples of random situations or methods of random generation • Recognize changes in probability and independence in without-replacement events • Make predictions that sometimes rely on representativeness strategies
Relational Probabilistic Thinking Student thinking shows an interconnection of probabilistic ideas.
Students exhibiting thinking at this level. . . • Reason with probabilities • Determine probabilities for complex situations including non-equally likely situations • Generate sample spaces for two-stage and three-stage experiments systematically • Connect sample spaces and probabilities • Examine distribution of outcomes without reverting to representativeness strategies • Show an appreciation of randomness by not being influenced by order or balance of outcomes

As illustrated in Table 2, the diverse concepts of probability material constitute pivotal components within the probabilistic thinking framework. There is a divergence of opinion regarding the edifice of knowledge that underpins probabilistic thinking. This aspect merits further scholarly investigation to ascertain the fundamental elements or constructs that underpin probabilistic thinking in its entirety. Indeed, research in any field of mathematics education must be underpinned by epistemological reflection on the object under study. In this context, an analysis of textbooks concerning essential knowledge that facilitates the ability of probabilistic thinking is conducted. Endraswara (2021) defines essential knowledge as knowledge that explains the nature of something, which is the core or substance in something. In this study, essential knowledge is defined as scholarly knowledge that is required and serves as the foundation for the formulation of knowledge taught from probabilistic thinking. The research data was analysed in the form of advanced mathematics reference books consisting of, among others: An Introduction to Probability and Statistical Inference Roussas (2015), Introduction to Probability and Mathematical Statistics (Bain & Engelhardt, 1993), and The Nature of Chance and Probability (Batanero et al., 2005). The researcher conducted a re-depersonalization and re-decontextualization process to reconstruct mathematical objects in formal form, so that the construction of mathematical objects in formal form is formed so that the construction of scholarly knowledge will be related to probabilistic thinking. The results of the scholarly knowledge analysis demonstrated that the construction of material related to probabilistic thinking is a stochastic model, randomness, fairness, random experiments, the probability of an event, independent events, conditional probability, basic concepts and results in counting.

Table 2
Key Components of the Prominent Probability Framework

	Concept of Probability Materials	Cognitive level organisation
Jones et al. (1997)	• Sample space • Odds of an event • Comparison of odds • Conditional probability • Event independence	• *Subjective* • *Transitional* • *Informal quantitative* • *Numerical*
Tarr & Jones (1997)	• Conditional probability • Event independence	• *Subjective* • *Transitional* • *Informal quantitative* • *Numerical*
Watson & Moritz (1997)	Measurement of probability (simple events, likelihood, comparison of events)	• *Iconic* • *Unistructural (U)* • *Multistructural (M)* • *Relational (R)*
Watson & Moritz (2003)	*Fairness*	• *Iconic* • *Unistructural (U)* • *Multistructural (M)* • *Relational (R)*
Watson & Caney (2005)	Random Process (definition of randomness, language, luck, equal-likelihood)	• *Iconic* • *Unistructural (U)* • *Multistructural (M)* • *Relational (R)*

As illustrated in Table 2, certain researchers employed disparate terminology when distinguishing between the cognitive levels of students. In general, the iconic mode of functioning is demonstrated by students in all framework development studies and is reflected in the inclusion of the prestructural level (subjective, prestructural/iconic) in each framework. Jones (Jones et al., 1997; Tarr & Jones, 1997) employs the term "Transitional", which characterises the transition from unstructured probabilistic thinking to quantitative thinking in students. Nevertheless, students' quantitative thinking is often disproportionate and occasionally flawed. It has been observed that students frequently revert to subjective thinking (Tarr & Jones, 1997). In a similar manner to the term "informal quantitative", when associated with SOLO, the stronger use of quantitative thinking is indicative of multistructural probabilistic thinking. The final level of this taxonomy is relational probabilistic thinking, which is based on students' ability to reason with probability capabilities. Students have the capacity to utilise or assign numerical probabilities in complex situations, encompassing both those with equal and unequal possibilities (Jones et al., 1997). Consequently, it can be posited that the numerical level delineated by Jones is congruent with the relational level as conceptualised within Watson's framework.

In order to respond to the following research question - namely, the adaptation of probabilistic thinking abilities to the content and characteristics of the curriculum in Indonesia, known as the Merdeka Curriculum - a thorough analysis of the minimum learning outcomes stipulated by the curriculum must be conducted. During the 2022/2023 and 2023/2024 academic years, the Merdeka Curriculum is available as one of the options that educational institutions can choose from. The Merdeka Curriculum has been meticulously designed to empower educators, granting them greater autonomy to craft learning experiences that are tailored to the individual needs of students, with a pronounced emphasis on character development. The curriculum is organised into six learning phases, with probabilistic material starting at the junior high school level in phase D, which is the main focus of this article.

The learning objectives stipulated in the Merdeka Curriculum for mathematics in phase D, which focuses on chance material, are that students can explain and use the notion of chance and relative frequency to determine the expected frequency of an event in a simple experiment (all experimental results can appear equally) (Kepala BSKAP Kemendikbudristek, 2024). It can thus be posited that the curriculum demands students to have the ability to think probabilistically. The curriculum delineates the materials to be taught as encompassing the definition of probability, relative frequency, and expected frequency. When considered in conjunction with preceding expert opinion, these materials can be further elaborated through the incorporation of constructs that foster probabilistic thinking, including the sample space, the probability of an event, and probability comparison. The sample space construct can be further enriched by introducing concepts of randomness and fairness, along with an introduction to stochastic events, which form the focal point of the probability material.

Conclusions

The present study is founded on the prior existence of a probabilistic thinking framework that utilises the SOLO taxonomy with cognitive thinking levels that are prestructural, unistructural, multistructural and relational. The material constructs (for junior high school) that have been adapted to the Merdeka curriculum are incorporated, namely the sample space

(randomness and fairness and an introduction to stochastic events), the probability of an event, and probability comparison. The framework that has been obtained as a result is as follows:

Tabel 3
A Framework for Assessing Students' Level of Probabilistic Thinking

Thinking Levels	Construction			
	Sample Space	Probability of an Event		Comparison of Probability
Subjective (Level 1)	The list of members of the set that may occur in a single event is not yet complete	Predicting the most/least likely event to occur based on subjective judgment	Distinguish "certain", "impossible" and "possible" events subjectively based on the sample space	Comparing the probability of an event in two different sample spaces, usually based on various subjective considerations
Transition (Level 2)	Complete in terms of registering members of the set that may occur in one event, but still relying on subjective opinion	Predicting the most/least likely event based on quantitative judgment but can return to subjective judgment	Distinguishing "certain", "impossible" and "possible" events within reasonable parameters	Making probability comparisons based on inconsistent quantitative assessments
Informal Quantitative (Level 3)	Complete in listing the members of the set that may occur in a single occurrence	Predict the most/least likely event based on quantitative judgments including situations involving contiguous outcomes	Distinguishing "certain, "impossible" and "possible" events and justifying them quantitatively	Making probability comparisons based on quantitative assessments related to the concept of opportunity that is consistently justified by valid quantitative reasoning but in a limited manner
Numeric (Level 4)	Complete in terms of registering members of the set that may occur in a single event and able to use the strategy in two or more events	Predict the most/least likely event based on the numerical probability of an event	Distinguishing "certain," "impossible" and "possible" events based on the membership of the overall sample space	Provides numerical probability measures and compares them

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The article under consideration was written using an AI-driven writing tool, specifically DeepL Write, which has been found to assist in refining grammar and enhancing its quality.

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Agricultural Human Resource Policies in the Age of Agricultural Labor Shortage: A Comparative Analysis on South Korea and Japan

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Abstract

This study asks why the local governmental actors in South Korea (hereafter, Korea) have revised its policies to secure agricultural workforces faster than those in Japan focusing on the measures for agricultural extension and training. Korea and Japan share not only the feature of agricultural structure but also the shortage of agricultural workforces due to the aging and population decrease. While Japan has revised its approaches to secure agricultural workforces gradually, Korea has done rapidly and actively. The author's literature review and interview of local government officers in the two countries indicate that the features of developmental state such as autonomous status by governmental actors in Korea contribute to the rapid and active revision. While the governmental sector in Korea holds autonomy from private actors, that in Japan tends to collaborate with private actors such as agricultural cooperatives. Differently from the age of developmental state in the 20th Century, however, the policy making in Korea has been decentralized recently.

Keywords: agriculture human resources, agricultural extension services, local government, Korea, Japan

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Introduction

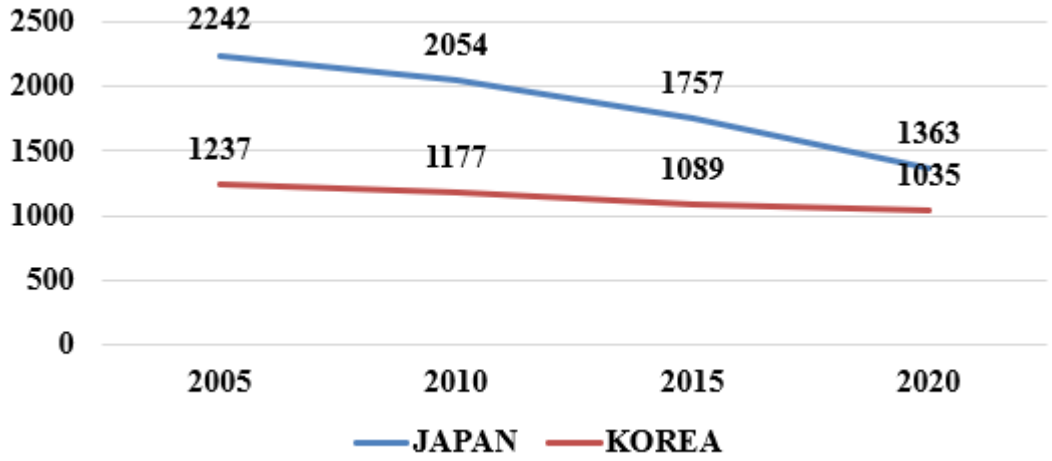
This study asks why the governmental actors in South Korea (hereafter, Korea) have revised its policies to secure agricultural workforces faster than those in Japan focusing on the measures for agricultural extension and training. The shortage of agricultural human resources has been one of the serious public policy subjects in the two East Asian countries for decades because of rural-to-urban migration, aging of incumbent farmers, and the shrinking of rural population. While Korea and Japan share the common policy subjects, however, the two countries' governmental sectors have shown different approaches to the subject. In other words, Korea has launched various programs to secure agricultural workforces faster than Japan since the 2010s. This study seeks the reason why the Korea's central and local governments have been able to launch the measures to secure human resources in agriculture by employing the research methods of literature review and interview.

Background of Study

In both Korea and Japan, the share of rural population has been decreased since the 1960s due to the rapid industrialization known as "the East Asian miracle" (World Bank, 1993). The outflow of workforces from the agricultural sector in the two countries has been covered by mechanization and some measures to attract the youth to farm sector (Ma & Nam, 2015; Yoo & Hwang, 2018). Since the 2010s, both the Korean and Japanese governments have promoted internal urban-to-rural migration to secure agricultural workforces (Nawakura, 2024).

As Figure 1 shows, however, the number of full-time farmers in the two countries has been decreased for the last two decades in spite of the governmental measures. This is, at least partly, because of the aging and retirement of incumbent farmers (The Associated Press, 2024). As of the mid-2020s, average age of the Japanese and Korean farmers is 68 years old and more than half of them have no successors to cultivate their farmlands. While the aged farmers retire, the urban-to-rural migration cannot cover the shortage of agricultural workforces because of their limited skills to operate their farmlands.

Figure 1
Number of Farmers in Korea and Japan (Unit: thousand)



Source: Ministry of Agriculture, Forestry and Fisheries (2025a) and Korean Statistical Information Service (2025a)

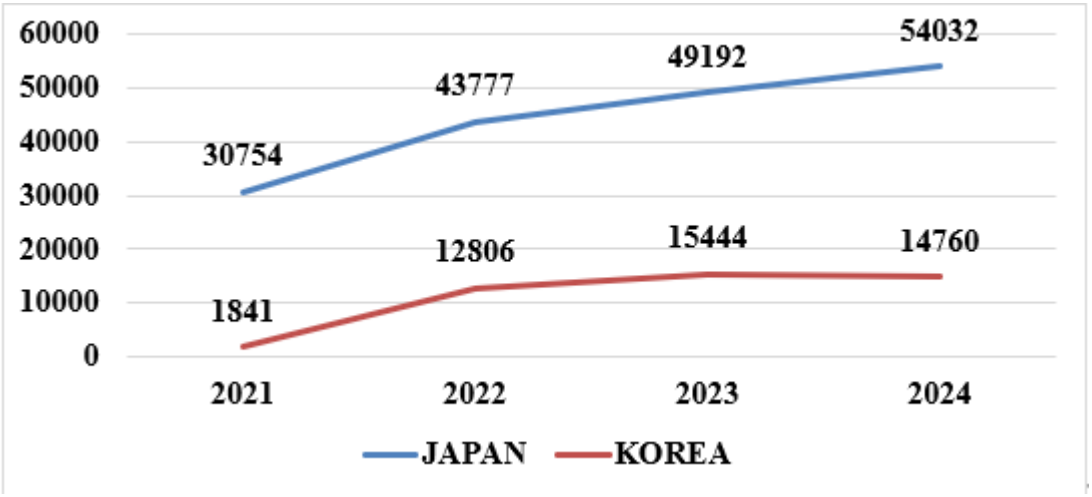
On the other hand, agriculture in Korea and Japan requires many workforces structurally compared with that in North America, Australia, and West Europe. Because of the mountainous landscape, the farmlands in Korea and Japan are highly fragmented except for some exceptional cases such as Hokkaido in Japan.[1] Under the geographical condition of much natural disaster such as typhoon and flood, in addition, agricultural works and facilities in Korea and Japan have played the role of flood control and reduced the damage caused by the natural disasters.[2] Because of those reasons, it is one of the primary policy subjects for the governments of Korea and Japan to secure the number of agricultural workforces.

Facing the similar difficulty as seen above, however, the governmental sectors in Korea and Japan show differences each other in responding to the task. The central and local governments in Japan have shown gradual change in the policies to secure agricultural workforces. In terms of the curriculum of agricultural colleges (*Nogyo Daigakko*, prefectural institutions of agricultural extension services), for example, the change of agricultural extension curriculum to grow young agricultural entrepreneurs has been proceeded gradually taking several years.[3] In Korea, on the other hand, the curriculum of the Provincial Agricultural Extension Services (*Nong-eop Gisulwon*) has been reformed rapidly and frequently responding to the structural changes of agricultural industry. For example, the support programs for small-sized professional farmers (*gangso-nong*) was decreased within a few years in the latter half of the 2010s while the central government began to promote the enlargement of farmland size per household to increase the competitiveness of individual Korean farmers in the free trade era[4] (Nawakura, 2025).

The difference between the two countries is clear also in terms of employing foreign workers in the agricultural sector. As Figure 2 indicates, Korea rapidly increased its number of foreign agricultural workers from 2021 (1,841) to 2022 (12,806). This is not only due to the COVID-19 pandemic but also to the launching of a seasonal visa program for foreign workers in the agricultural sector. The Korea's seasonal visa program enables mayors in individual municipalities to exchange Memorandum of Understanding (MoU) directly with the leaders of rural municipalities in developing countries bypassing the central government[5] while Japan accepts foreign agricultural workers based on annual visa programs guided by the central government.

[1] For detail, see Nawakura (2019).
[2] For example, see INAS (n.d.)
[3] The analysis by Magaki & Yoshida (2020) indicates that, though most agricultural colleges in Japan acknowledge the necessity to support young agricultural entrepreneurs, the curriculum of most colleges still emphasize to train the children of incumbent farmers as their parents' successors.
[4] Since the early 2000s, Korea has concluded free trade agreements with major economies around the world such as the United States and the European Union.
[5] For example, Ravindran (2025).

Figure 2
Number of Foreign Agricultural Workers in Korea and Japan[6]



Source: Ministry of Agriculture, Forestry and Fisheries (2025b) and Korean Statistical Information Service, (2025b)

This study seeks the reason why the Korean authorities have been more active to reform its agricultural structure more rapidly than Japan. For setting the framework of the analysis, the next section reviews previous studies and shows hypothesis.

Literature Review and Hypotheses

As Nawakura (2019) points out, Korea is one of the rare countries to achieve the rapid transition from low-income countries to high-income ones without serious income gap between urban and rural sectors. Though the income per farming household in the 1980s stagnated to 70-80% of that of urban dwellers temporarily, the nation has succeeded in raising the income not only of urban workers but also of agricultural ones for decades. In the processes of the parallel development of urban and rural sectors, as Jeong (2023) and Burmeister (1990) point out, the government played active roles in promoting agricultural productivity such as planning seed production and effective retailing of agricultural products. In the previous works of developmental state, such active and autonomous status of the Korean state was described as “embedded autonomy” as Evans (1995) argues.

On the other hand, the Japanese agricultural development can be featured with the coordination among the central government, local authorities (both prefectural and municipal), agricultural cooperatives, and individual farmers. Yoshida (2012) and Iida (2017) describes that the agricultural policies by the ruling Liberal Democratic Party have been determined as a result of the negotiation and coordination among the Party, executive branch of the government, and some private actors such as agricultural cooperatives. Though Japan has been known as one of the developmental states to achieve rapid economic growth under the leadership of the state sector (Johnson, 1983), its agricultural policies have been determined as a result of the coordination by public and private actors rather than the direction by the state.

[6] Note that the Korean data includes foreign agricultural workers under both annual and seasonal permission while the Japanese one include only those under annual permission.

The previous studies reviewed above show that Korea and Japan have differences in terms of the scope to apply the developmental state model. While Korea has applied its developmental state model not only on urban industry but also on agricultural sector, Japan has employed different style of the state's intervention between urban industry and agriculture.[7] This suggests the possibility that the Korea's developmental state approaches, particularly the embedded autonomy, have contributed to the faster changes in agricultural human resource policies than Japan.

On the other hand, however, both the governments of Korea and Japan have promoted decentralization and the vitalization of local governments in agricultural politics. As Hwang (2019) points out, a series of decentralization in the 2010s has transferred various subsidy programs and legal rights from the central government to the local ones in agricultural policies. Also in Japan, the central government has promoted local governments to vitalize the nation's rural industry since the mid-2010s in the name of *Chiho-sosei* (regional revitalization).[8] This means that, differently from the age of the developmental state in the latter half of the 20th Century, the central governments of Korea and Japan today launch and execute their rural policies with collaboration with local governments.

Reviewing existing studies above, this study sets a hypothesis that local governments in Korea has launched the policies to secure agricultural workforces more rapidly than those in Japan based on the methods of developmental state such as autonomous decision making by governmental sector and the commanding status of the governments on private actors. In addition, this study also sets the hypothesis that the developmental state approaches are sustained even in the age of decentralization. The two sections below analyze the local governments' actions to secure agricultural workforces in the age of population shrinking.

Japan: Coordination With Private Sector

Since the early phase of the industrialization in the 1960s, the number of farmers in Japan has been decreased nationwide. In order to secure the workforces in agricultural sector, the Ministry of Agriculture, Forestry, and Fisheries (MAFF) has launched various programs to support the Japanese youth to work in agricultural sector (Hirowatari, 2008). In the prefectural level, agricultural colleges located in 43 out of 47 prefectures nationwide have acted as major institutions to train the youth to professional farmers.

On the other hand, the Japanese local governments have launched some policies to invite urban workers and/or employees in enterprise-operated farms to operate their local farmlands. As a major option to train those domestic immigrants, the Community-Reactivating Cooperator Squad Program (*Chiiki-okoshi Kyoryokutai*, CRCS) operated by the Ministry of Internal Affairs and Communication (MIC). The CRCS is the program to enable local governments to employ young and talentful domestic immigrants as officers in the local governments with the term of three years (Ministry of Internal Affairs and Communication, n.d.). The wage for the CRCS members is wholly covered by the central government's subsidy. According to the statistics by the MIC, at least 403

[7] Note that Johnson (1983) applied his argument of developmental state mainly on industrialization policies by the Ministry of International Trade and Industry and made limited mention to agricultural policies by the Ministry of Agriculture, Forestry, and Fisheries.
[8] For example, see Ministry of Agriculture, Forestry and Fisheries (2024).

people out of the 4,463 CRCS veterans became professional farm operators in rural municipalities (Ministry of Internal Affairs and Communication, 2024).

While the CRCS Program contributes to secure urban youngsters to work in agricultural sector, however, it is another problem to grow them as professional farmers. Related to this policy subject, the author implemented interview on municipal officers and incumbent farmers in Hokkaido Prefecture and Akita Prefecture in northern Japan in autumn, 2024.

Nayoro City, a rural municipality located in northern Hokkaido, has secured the successors of their rice production by the CRCS Program. In 2021, the Nayoro municipal government nominated Mr. Ryo Nishikawa, a domestic immigrant from Shizuoka Prefecture of Central Japan, as a CRCS member to secure a young worker in its agricultural sector. Mr. Nishikawa worked as an employee of enterprise-operated farms in his previous residence in Shizuoka for three years. Because the agricultural operator requires different skills from employed agricultural workers, he needed to learn how to operate agriculture as an autonomous farm operator. Mr. Nishikawa said “The previous operator of my farmland in Nayoro played the role as a trainer of farm operation” (R. Nishikawa, personal communication, October 29, 2024).

While Mr. Nishikawa emphasized that the previous operator taught rich information and know-how of farm operation, the personal training had limits to learn whole of agricultural work in cold region in northern Japan because the previous operator was highly aged when Mr. Nishikawa began to farm in Nayoro. To follow it, the Nayoro municipal government employed a coordinator to assist the young farmers to brush up their skills of farm operation. Japan Agriculture Dohoku Nayoro, an agricultural cooperative in Nayoro City, recommended Mr. Tadao Ohta, a former agricultural cooperative manager, as a candidate for the coordinator to the municipal government. The municipal government followed the recommendation by the agricultural cooperative. Mr. Ohta has acted as a coordinator for newly migrated farmers to Nayoro for several years (T. Ohta & H. Sengoku, personal communication, October 29, 2024).

Mr. Hiroshi Sengoku, a chief officer of Agricultural Bureau, Nayoro municipal government noted “We do not rely on the agricultural cooperative to secure human resources for the coordinator. We the municipal government autonomously select Mr. Ohta as an agricultural coordinator in our city” (H. Sengoku, personal communication, October 29, 2024). On the other hand, however, both Mr. Sengoku and Mr. Ohta recognized that the partnership between the municipal government and the agricultural cooperative was “an important resource to secure young and skilled human resources in our city’s agriculture” (T. Ohta & H. Sengoku, October 29, 2024). Because the municipal government itself does not have its own organization and human resources for agricultural training, the partnership with agricultural cooperative can be *de facto* only major option to secure agricultural coordinators or trainers locally. This indicates that agriculture cooperatives can play major role in implementing local governments’ policies to secure agricultural workforces.

While the local agricultural cooperative plays major role in supplying agricultural coordinators or trainers to the municipal government in some regions such as Nayoro City, private enterprises can also play an important role in securing agricultural

workforces in other regions. Kita-Akita City located in northern Akita Prefecture is an example for it.

Japanese parsley (*seri*) has been one of the major agricultural products in Kita-Akita City. Because of aging of incumbent farmers and the shortage of their successors, however, the number of Japanese parsley farmers in the municipality has been decreased for decades. As a tool to secure successors, Mr. Hiroyuki Chiba, a chief officer of Industry Bureau, Kita-Akita municipal government, contacted *Kokohore* Japan,[9] a social enterprise to support M&A in rural areas. "In the process of surveying the current status of our city's industry," Mr. Chiba said "the municipal government acknowledged the necessity to invite youngsters from other regions to secure the sustainability of our city's industry including agriculture (H. Chiba, personal communication, November 12, 2024). For that purpose, it was a reasonable option to contract with *Kokohore* Japan." *Kokohore* Japan uploaded some advertisements to call for a successor of parsley farms on the Internet and found a young candidate for the parsley farming in Kita-Akita City. The candidate, according to Mr. Katsutoshi Asai, the president of *Kokohore* Japan, has been under training supervised by the incumbent parsley farmer since 2023 (K. Asai &, personal communication, November 12, 2024).

The Japanese cases above indicate that the local governments in Japan prefer a policy approach to build coordination with private actors such as agricultural cooperatives and social enterprises in securing agricultural workforces in the age of aging and population shrinking. This policy approach needs several years from the beginning of the coordination to the official launching of policy. Mr. Chiba of Kita-Akita City said "I and Mr. Asai began to consult each other in 2020. The municipal government and *Kokohore* Japan officially built the framework to secure local workforces in 2022." Also Mr. Sengoku of Nayoro City said "The municipal government began to seek a way to use CRCS program to secure agricultural workforces in the latter half of the 2010s. After the consultation with agriculture-related actors in the municipality for a year, we began to call for the CRCS candidates in 2019." Because transparency and accountability are required for governmental actors to be collaborated with private ones, the preparation period occurs as unavoidable policy cost.

South Korea: Autonomy in Governmental Actors

Since the early 2010s, the government of Korea has promoted its urban dwellers to migrate to rural areas in order to secure human resources in agriculture-related industry. In 2012, the Ministry of Agriculture, Fishery, and Rural Affairs (MAFRA) and the Rural Development Administration (RDA) jointly launched the Return Farm (*guinong-guichon*) Plan to promote the internal migration. This plan includes loan programs to lease the initial cost to begin farm operations up to 300 million Won (USD 200,000) per household (Rural Development Administration, n.d.). Encouraged by severe socioeconomic competition in urban business, more than 20,000 dwellers nationwide have migrated to rural areas per year since 2012 (Rural Development Administration, n.d.). While the government's Return Farm policy has succeeded to the internal migration to rural areas, however, the return farmers' insufficient agricultural skill has been one of the major subjects for both the central government and rural areas (Nawakura, 2019). In

[9] The words "*Kokohore* Japan" means "Discover the potential of Japan" in Japanese.

other words, the training of agricultural skills for the urban-to-rural internal immigrants has been one of the major subjects to secure agricultural workforces in Korea.

The MAFRA and the RDA have offered agricultural extension services for the internal immigrants for more than a decade. Under the guidance of the two central governmental organizations, tuition-free agricultural training programs have been operated by extension service bureaus of provincial governments and agricultural technology centers of municipal governments nationwide (Nawakura, 2019). The trainers in the extension services are local government officers in many cases. To secure the quality of training by municipal governments' officers, provincial governments offer some educational programs to upgrade their teaching and training skills.

Mr. Jin Woo-yong, a coordinator of Agricultural Technology Center of Seoul municipal government, said "Though our program offers only partial know-how for farm operation, the urban-to-rural internal immigrants are active (W. Jin, personal communication, August 21, 2014). They once learn in our Center prior to the migration. And moving to rural areas, they continue the learning by participating in rural municipalities' extension programs" to the author's interview in 2014. The fact above indicates that governmental sector plays important role in securing agricultural workforces in Korea. To brush up the teaching skills of municipal officers as trainers in the agricultural extension services, some provincial governments offer the learning courses for the local officers (Nawakura, 2025).

While the central and local governments in Korea have offered extension programs to secure skilled agricultural workforces, the country's private actors have been less active than the Japan's ones. The National Agricultural Cooperative Federation (NACF) launched its nationwide program "Young Farmer Academy (*Cheongnyeon-nongbu Sagwanhakkyo*)" to train youngsters to professional farmers in the early 2020s (Lee, 2024). While the Japanese agricultural cooperatives prefer to collaborate with local governments to train new young farmers as seen in the case of Nayoro, however, the Young Farmer Academy is an independent program by the NACF (Lee, 2024). In other words, both the governmental and private actors operate their own programs to secure agricultural workforces independently each other.

The autonomous status of the governmental actors enables the central and local governments to revise their agricultural extension programs rapidly responding the changes of agricultural environment. Nawakura (2025) points out that the RDA and the North Chungcheong Province Agricultural Extension Service have frequently revised their policy to train the youth as farmer candidates. Though the Provincial government emphasized the necessity to grow the farmers for high-valued agriculture in the 2010s, for example, the local government shifted its emphasis to grow farmers as the successors for aged incumbent farmers in the 2020s (Nawakura, 2025).

While the government actors hold autonomy from private actors, however, the decentralization since the early 2000s has changed the relations between the central and local governments gradually. Local governments launch their annual plans for agricultural extension and training programs referencing the RDA's policy documents and it has encouraged vertical cooperation between central and local government.

On the other hand, some provincial governments launch their original extension and training programs. The *Gangso-nong* (small professional farmers) is an example of it. As a series of measures to upgrade the efficiency of Korean agriculture, the RDA and the MAFRA have promoted to grow *gangso-nong*, such as small-sized organic farming to produce high-valued vegetable in the early and middle 2010s. Under the pressure of large-sized farming due to trade liberalization, the central governmental organizations have reduced their subsidy for *gangso-nong* since the end of the 2010s. However, some provincial governments sustained their extension programs for *gangso-nong* after the reduction of the central government's subsidy in the early 2020s (Nawakura, 2025). In terms of the relation with the central government, Mr. K, an officer of Agricultural Policy Bureau, South Jeolla Province, said "Today, we the provincial government determine what is needed to be done for agricultural education and training." to the author's interview (K, personal communication, February 1, 2025). The governmental sector is still autonomous to the private sector in Korea's agricultural human resource policies as well as the age of developmental state in the 20th Century, the local governments have gained their autonomous status in recent years.

Concluding Remarks

This study asks why the governmental actors in Korea have revised their policies to secure agricultural workforces faster than those in Japan focusing on the measures for agricultural extension and training. In order to answer the question above, the author implemented literature review and interview of local government officers in the two countries. The result of the author's analysis indicates that the features of developmental state approach in Korea's agricultural policies contribute to the rapid and active revision. While the governmental actors in Korea hold autonomy from private actors, the municipal governments in rural Japan have launched the programs to secure agricultural workforces base on the collaboration with private actors such as agricultural cooperatives. Differently from the age of developmental state in the 20th Century, however, the policy making in Korea has been decentralized recently.

The argument above, however, is based on only literature review and the interview on small number of local officers in Korea and Japan. The empirical analysis with the interview on larger number of officers including the central governments of the two countries is a future subject.

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Appendix

Interviewees

Name	Date	Venue	Language
JIN Woo-yong	Aug. 21, 2014	Agricultural Technology Center, Seoul Metropolitan City	Korean
Ryo NISHIKAWA	Oct. 29, 2024	Agricultural Bureau, Nayoro Municipal Government Office, Nayoro City, Hokkaido	Japanese
Tadao OHTA			
Hiroshi SENGOKU			
Hiroyuki CHIBA	Nov. 12, 2024	Kita-Akita Community Plaza, Kita-Akita City, Akita Prefecture	Japanese
Toshikatsu ASAI			
K (anonymous)	Feb. 1, 2025	South Jeolla Province Agricultural Museum, Yeong-am County, South Jeolla Province	Korean

Implementation of the Voluntary Regulation Concept on Green Technology Policy in the Face of Climate Change in Indonesia

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Abstract

The world has entered a phase of environmental damage in the phenomenon of Climate Change. The industrial economy can no longer be run as it should (business as usual) but requires special attention to the environment through the green economy. Generally, the law is present in the context of climate change to provide justice not only to humans but to the environment, but there are problems because the green industry rules as stated in Law Number 3 of 2014 concerning Industry only require voluntary environmental preservation. The problem is studied with a legal historical, conceptual and legislative approach so that the research objectives to find out the development of green technology policies to the application of the concept of voluntary rules in Indonesia are achieved. The type of legal research used is normative legal research with deductive thinking method. Analysis of norms is carried out qualitatively to find the weaknesses of voluntary policies using the Compulsory Concept and the Concept of Sustainable Development as a solution using the Theory of Economic Democracy. Both concepts are considered by the author as a solution to reduce environmental damage because environmental safety is more important than profits from industrial activities. Data is obtained through literature study, especially using Law Number 3 Year 2014. The results show that voluntary rules do not have a deterrent effect on business actors for violations of environmental damage because the punishment given is only limited to compensation to the state, not imprisonment. Compensation makes the rules of the green industry counter to the environment so that the rules of green industry law are paradoxical to the purpose of the values of the green industry which provides justice to economic activity and the environment.

Keywords: volunteering, green technology, climate

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Introduction

Indonesia is an archipelago maritime country, there are coastal areas around which there is a lot of social life. The first climate change felt by the community is the abrasion of coastal areas which causes tidal floods or coastal floods. This tidal flood occurs because sea levels are rising due to global warming, which occurs due to the earth's increasingly hot temperatures (climate change). The north and south poles experience melting ice (glaciers) as well as snow-capped mountains such as Cartenz Peak in Jayawijaya Peak Papua and Everest Peak Himalaya melt so that sea levels rise. Rising sea levels cause coastal areas to experience abrasion and protrude further inland.

Social areas in coastal areas are affected, some villages have been submerged by tidal floods such as in the north coast of Java, also in Jakarta there are several villages that have been in the sea area, and can still be seen the existence of buildings that were once on land now located in the ocean. Changes in the pattern of dry and rainy seasons with extreme discharge also occur in Indonesia, which are affected by agricultural patterns that have also been dependent on dry and rainy weather patterns. The uncertainty of the dry and rainy seasons causes agriculture to not run properly, planting patterns and harvest seasons to fail. This can eventually lead to a lack of national food stocks.

The phenomenon of hail in some areas occurs, droughts and floods in several other areas in Indonesia are also often encountered. The phenomenon of volcanic eruptions and earthquakes accompanied by tsunamis is also felt in several places in Indonesia as a result of the phenomenon of climate change. Climate Change in the world also results in changing weather patterns and seasons and the rise of natural disasters that occur, so the United Nations takes steps in the Framework Convention on Climate Change (UNFCCC) and the Conference of the Parties (COP). The steps taken by the UN as a result of the increasingly warming temperature of the earth due to human activity (anthropogrnic) which results in serious environmental damage and threatens human life. The UNFCCC was established in 1992 with the aim of stabilizing greenhouse gas concentrations due to the behavior of human activity in the Industrial sector. The UNFCCC became the foundation for global climate negotiations with the Kyoto Protocol agreement in 1997, the Paris Agreement in 2015, Dubai in 2023. Meetings in the COP aim to reduce the earth's temperature so that global warming can be resolved.

The “green technology” policy means that the production and management of industrial activities prioritize environmental sustainability. The policy in the regulation is contained in Law Number 3 of 2014 concerning Industry, this regulation adds categorization of industrial behavior into two types, namely industry and green industry. The green technology referred to here is the activity of the green industry. Green industry is an industrial activity that in the production process prioritizes efforts to efficiently and effectively use resources in a sustainable manner so as to harmonize industrial development with the preservation of environmental functions and can provide benefits to society.

Efficient and effective production behavior and management of industrial companies using new renewable energy such as solar power, wind power, hydropower, then using reduce, reuse and recycle waste treatment methods. Reduce is the behavior of reducing the use of products that have the potential to become waste, using energy more efficiently, buying products with minimal packaging. Reuse is a behavior pattern that reuses used products such as bottles or cans that can be reused into creative ideas such as pots, or storage areas. Recycle

is a behavior pattern that transforms used materials into new materials that can be reused by processing and refining waste to produce new products such as recycled paper, shoes from plastic waste, bags from plastic waste.

The regulatory policy adds new rules on industrial behavior because the phenomenon of climate change is predominantly generated from human activities in the industrial sector, so that new rules in the form of green industry are expected to be able to provide solutions to climate change problems, especially on the behavior of industry. Green industry rules are new rules that previously the rules on industry only cover industrial patterns in the sense of economic dimension behavior patterns alone, while adding new rules in the form of green industry is a reconceptualization of rules that add environmental sustainability functions to industrial activities. The economic field has a new definition that collaborates with environmental sustainability, as a result of which business as usual can no longer be applied freely.

Green technology policies are expected to reduce environmental damage due to climate change. However, the policy needs to refer to the concept of sustainable development as stipulated in the 1945 Constitution Chapter XIV National Economy and Social Welfare Article 33, specifically paragraph (1) and paragraph (4) on the Economy is structured as a joint venture based on the principle of kinship and the national economy is organized based on economic democracy with the principles of togetherness, equitable efficiency, sustainable, environmentally sound, independence, and by maintaining a balance of progress and national economic unity. The principle of green industry which contains technology or appropriate ways of industrial behavior on the preservation of environmental functions is the precautionary principle as a form of togetherness and sustainability. Togetherness here is interpreted as a whole ecosystem unity from human behavior will have an impact on natural entities.

Policies that do not refer to the precautionary principle will make green industry rules ineffective. Green industry policy in Indonesia is voluntary, meaning that this rule does not have strong coercive power to require industrial behaviors that have the potential to damage the environment to change the habitual patterns of production and industrial management into patterns of efficiency and effectiveness of pro-environmental industrial production and management. The policy of voluntary rules can be seen from the formulation of Law Number 3 of 2014 concerning Industry Chapter VIII concerning Industrial Empowerment, the second part of Green Industry Article 80 paragraph (1), namely the application of Green Industry standards as referred to in Article 79 paragraph (2) can gradually be applied on a mandatory basis. The urgency of climate change in the rule of law should contain firmness as the authority of the law, when the phrase gradually applied is not taken seriously, it creates an opportunity for a rubber article on the rules of the green industry as the vanguard of solutions to industrial behavior that has the potential to damage the environment.

As a result, the impact of environmental damage remains unchanged from before the implementation of technological policies in the green industry from the industrial policy of Law Number 5 of 1984 concerning Industry which regulates industrial aspects whose scope and objectives regulate economic aspects where natural resources are optimally utilized, and have not touched on aspects of environmental preservation because climate change at that time has not significantly affected the damage to the earth. Until after the implementation of green industry rules that refer to the efficiency and effectiveness of the technology used in the production process and industrial business management in the rules of Law Number 13 of

2014 concerning Industry which has accommodated green industry as an industrial activity aimed at advancing sustainable economic welfare, sustainable is an economic function that can realize environmental preservation.

2023 is set to be the hottest year by the World Meteorology Organization. This is seen from the indicator of the increase in global average sea level more than doubled from 1993-2002 to 2013-2022. Deforestation in 2017-2012 with an average value of 2.54 million Ha/year or equivalent to 6 times the area of a football field per minute, affects the loss of microclimate regulators, food sources for indigenous peoples or local communities, water and soil conservation, biodiversity, medicinal plant potential, food sources, oxygen providers, energy, and local cultural values (Forest Watch Indonesia, 2024). Research conducted by WALHI found that 159 million hectares of forest land have been plotted in extractive industry investment licenses. The land area is legally controlled by corporations by 82.91%, while the sea area is 29.75%. IPBES data in 2018 shows that Indonesia annually loses 689 thousand hectares of forest land, and is the largest in the Southeast Asia region. For rivers, the Ministry of Environment noted that 101 rivers are moderately to severely polluted and damaged and the loss of natural wealth, biodiversity and culture in Indonesia (Unnes, 2024).

The cement, steel, metal, textile, mining sectors such as coal, nickel, food industry, tourism, and other industries contribute to the carbon output of these industrial activities, which can have an impact on the phenomenon of climate change. Under the business as usual scheme, the total industrial sector GHG emissions of CO2, CH4, and N2O from energy, waste and Industrial Process and Product Use (IPPU) emission sources are estimated to increase from 307.4 million tons of CO2 equivalent (MtCO2e) in 2016 to 442.4 million tons of CO2 equivalent (MtCO2e) in 2030, with 339.1 MtCO2-e of direct and indirect energy emissions 86 MtCO2-e of IPPU emissions and 6.1 MtCO2=e of waste emissions (Ministry of Industry, 2018). Indonesia has ten industrial sectors that contribute foreign exchange to the country, namely, palm oil exports of US$ 31.49 billion; Indonesian Migrant Workers US$ 9.71 billion; Tourism Sector US$ 7.03 billion; Textile Industry Exports US$ 3.38 billion; Oil and Gas Exports US$ 15.921 million; Mineral Fuel (Coal) Exports US$ 43.572 million; Iron and Steel Exports US$ 26.704 million; Electrical Machinery / Equipment Exports US$ 14.342 million; Vehicle and Parts Exports US$ 11.152 million; Metal Ore, Crust and Ash Exports US$ 8.72 million. Bank Indonesia recorded the position of the Republic of Indonesia's foreign exchange reserves at the end of September 2024 at US$ 149.9 billion (Choiriyah, 2024).

Based on the explanation of the problem, the author proposes a compulsory concept. The concept is focused on economic democracy to realize sustainable development as a core form of green industrial activity which in principle states that economic activity must be able to accommodate the dynamics of environmental changes that occur because economic democracy is a form of environmentally sound economy, in accordance with the ideals of Mohammad Hatta in the principle of individuality. Individuality is the persona of a person who is able to realize his self-esteem. The price of a human being cannot be valued because it was created by the Creator, as well as nature which was equally created by the Creator, so that people who are aware of their dignity are people who are able to be aware in every activity (especially activities in the industrial sector) to continue to respect and appreciate fellow creations of the other Creator. Therefore, we want to examine the solution to the problem of the weakness of voluntary rules in Law Number 13 of 2014 concerning Industry, using the Concept of Sustainable Development as a form of economic democracy.

Methodology of Research

This paper uses normative legal research. The focal point of the research is in the form of applicable laws and regulations. The data required is secondary data in the form of primary legal materials in the form of laws and regulations, namely the 1945 Constitution, Law Number 3 of 2014 concerning Industry, Law Number 32 of 2009 concerning the Environmental Protection and Management Act, Government Regulation Number 28 of 2021 concerning the Implementation of the Industrial Sector, Presidential Regulation Number 74 of 2022 and secondary legal materials in the form of legal doctrines and legal principles. Legal doctrine in the form of the principle of togetherness or individuality as proposed by Muhammad Hatta and legal principles such as the principle of prudential law or preauctionary principle. The research was analyzed using legal history, conceptual and statutory approaches. The legal history approach is used to look for legal rules related to the business climate that regulate investment and investment in industrial rules after Indonesian Independence until the current industrial rules, in order to understand the values and principles of the rules and the development of the legal rules. Followed by a conceptual approach is carried out when the research does not depart from the existing legal rules. This is done because the rules of law governing the nature of mandatory rules so that the coercive power of the law in maintaining order. The legislative approach is used by the author to trace laws and regulations hierarchically, namely the 1945 Constitution, laws, government regulations to presidential regulations. The whole approach is analyzed using the Theory of Economic Democracy as Article 2 letter b of Law Number 3 of 2014 that economic democracy is a democracy with a spirit of togetherness, equitable efficiency, sustainability, environmental insight and independence and maintaining a balance of progress in national economic unity. In relation to the green industry, the principles used are efficiency, effectiveness and sustainability that emphasize the ability to harmonize and harmonize industry with environmental sustainability. The preservation of environmental functions in order to provide benefits to society. This is considering that green industry is essentially industrial development that pays attention to environmental sustainability.

Results and Discussion

Overview of Green Industrial Technology Policy in the Face of Climate Change

Only One Earth is an undeniable reality to this day. The activities of one human will not only affect other humans, but also affect the natural environment. The sustainability of the environment and future generations of humans needs to be considered along with the current human activities. As Mahatma Gandhi said, “Earth provides enough to satisfy every man's needs, but not every man's greed”. Human greed needs to be limited so that it does not lead to the destruction of life on earth, starting from biodiversity, certain species, and future generations of humans.

Human life on earth has big challenges to be given a solution, these challenges are climate change, biodiversity loss and pollution (Triple Planet Challenges). The solution to these three things requires a re-conceptualization of the things we have done, including the concept of law. Law is a means of regulating human life so that order is always maintained. Order is the regularity of things that run as they should so as not to cause chaos, if order results in chaos then order through law is a form of “humanity has opened the gates of hell”. Human activities that contribute to the behavior of eliminating other species on earth include pesticide products. Rachel Carson in the book silent spring in 1962 wrote about pesticides that are

harmful to good biodiversity rather than annoying pests. The biodiversity that provides the sounds of nature is lost or quiet because it dies along with the pests as a result of pesticide application to crops.

The regulation of industry in Indonesia has evolved. The regulation on industry number 5 of 1984, regulates industry by definition as an economic activity that processes raw materials, raw materials, semi-finished goods, and/or finished goods into goods with higher value for their use, including industrial design and engineering activities (Government of Indonesia, 1984). This regulation still regulates industrial activities limited to the purpose of profit from processing industrial products for the welfare and prosperity of society. There is no scope for a sustainable industry that includes environmental sustainability as a goal and community welfare. This regulation on industry has changed in line with the times and the ongoing natural phenomenon of climate change. The Indonesian government has amended Law Number 5 of 1984 concerning Industry into Law Number 3 of 2014 concerning Industry. This regulation divides activities in the industrial sector into two types, namely industry and green industry. The definition of industry is all forms of economic activity that process raw materials and / or utilize industrial resources so as to produce goods that have added value or higher benefits, including industrial services, while green industry is an industry that in the production process prioritizes efficiency and effectiveness in the use of resources in a sustainable manner so as to be able to harmonize industrial development with the preservation of environmental functions and can provide benefits to society (Government of Indonesia, 2014).

The principle of industrial regulation, especially green industry, is economic democracy. The 1945 Constitution of the Republic of Indonesia Chapter XIV on the National Economy and Social Welfare is the basic foundation of industrial regulations, Article 33 paragraph (4) contains the national economy organized based on economic democracy. Economic democracy accommodates the principles of togetherness, equitable efficiency, sustainability, environmental insight, independence, and by maintaining a balance of progress and national economic unity (Government of Indonesia, 1945). Business as usual is re-conceptualized into green industry. Green industry rules have a voluntary nature, with administrative sanctions. The non-mandatory nature is important to be studied legally on the strength of legal coercion to protect activities in the industrial sector on the phenomenon of climate change. Administrative sanctions are also important to be studied legally related to the objectives of green industry rules that are different from the objectives of industrial rules that prioritize the economy, while the green industry prioritizes industrial activities that contain environmental sustainability.

Indonesia is committed to curbing global temperature rise in accordance with the Paris Agreement, as outlined in the Nationally Determined Contribution (NDC) to reduce greenhouse gas emissions by 2030 by 31.89% with its own efforts and 43.20% with international assistance. The year 2023 is set to be the hottest year by the World Meteorology Organization. This is seen from the indicator of the increase in global average sea level more than doubled from 1993-2002 to 2013-2022. Deforestation in 2017-2012 with an average value of 2.54 million Ha/year or equivalent to 6 times the area of a football field per minute, affects the loss of microclimate regulators, food sources for indigenous peoples or local communities, water and soil conservation, biodiversity, medicinal plant potential, food sources, oxygen providers, energy, and local cultural values (Forest Watch Indonesia, 2024). Research conducted by WALHI found that 159 million hectares of forest land have been plotted in extractive industry investment licenses. The land area is legally controlled by

corporations by 82.91%, while the sea area is 29.75%. IPBES data in 2018 shows that Indonesia annually loses 689 thousand hectares of forest land, and is the largest in the Southeast Asia region. For rivers, the Ministry of Environment recorded 101 rivers as moderately to heavily polluted, as well as damage and loss of natural resources, biodiversity and culture in Indonesia (Unnes, 2024).

Currently, Indonesia still has many incidents such as abrasion in coastal areas that are getting worse, deforestation for new land clearing by corporations, opening of cement factories, uncontrolled mining that damages the natural environment. These things are a paradoxical relationship to increasing prosperity in the development of the nation from the economy, so that environmental sustainability is still not part of the concept of sustainable development. For this reason, the green industry regulations currently in force need to be reviewed in relation to the objectives of the green industry that realize sustainable development.

Discussion

Green industry is an industry that in the production process prioritizes efforts to increase the efficiency and effectiveness of the use of resources in a sustainable manner so as to harmonize industrial development with the preservation of environmental functions and can provide benefits to society. The purpose of the green industry is that companies that are green industry companies develop plans for utilizing natural resources by managing and utilizing them efficiently, environmentally friendly and sustainably. The terms of the provisions of the green industry are industrial businesses that include raw materials, supporting materials, and energy, production processes, products, business management and waste management that pay attention to the safety, health, and safety of animals and plants, preservation of environmental functions which are expected to withstand the rate of increase in earth temperature, so as to create order in industrial activities in the era of climate change. This policy is in Law Number 13 of 2014 concerning Industry specifically the rules governing green industry. International policies can be seen from international agreements in the UNFCCC and COP.

Before the existence of green industry regulations, policies in Indonesia, especially in industrial activities, prioritized profit or economic gain alone in order to realize the welfare of society. In the beginning, it was not wrong when industrial activities accommodated aspects of the economy because the economy was an activity to make a profit. Natural disasters such as tsunamis, earthquakes are increasingly frequent, erratic changes in weather patterns. Homes and lives are lost, and cropping patterns for primary needs in the form of basic food are threatened to not be fulfilled by humans in carrying out activities in the agricultural sector. Comes the implementation of green industry rules, which begin to map and classify industrial sectors that can contribute to causing environmental damage in their activities.

When talking about voluntary rules, there is a voluntary concept that is faced with the concept of compulsion or compulsory. The concept of voluntary rules is a rule that has a non-mandatory nature, meaning that rules that do not have to be followed and carried out (may carry out the rules of a rule, may also not carry out). Sanctions for voluntary rules are usually sanctions for administrative violations and the penalties are warnings and revocation of business licenses and fines. Enforcement is carried out by the Ministry of Industry, Ministry of Environment and the Attorney General's Office. The weakness of voluntary rules, in accordance with the characteristics of the law is the power of coercion that binds and shows its authority. In the context of orderly industrial behavior that has the potential to damage the

environment in the phenomenon of climate change, the nature of this voluntary rule does not show strong regulatory coercion, so the goal of orderly industrial behavior to reduce the rate of climate change is not achieved.

On the other hand, the concept of compulsory rules is the nature of rules that have strong coercion to be obeyed, followed and feared if they do not carry out these orders, due to their mandatory nature. Sanctions that are usually applied are fines to criminal sanctions for those who do not heed a mandatory rule, so that mandatory rules can put more pressure on violators who can have a deterrent effect. The weakness of this rule is that the activity of complying with regulations is not necessarily from the awareness of industry players, but rather the fear effect of industry players if they violate, so not necessarily legal awareness is formed.

The Relationship Between Environmental Damage and the Application of the Voluntary Rule Concept

Variations of environmental damage are deforestation or deforestation which is still massive, forest fires on a large scale as a result of clearing industrial land damaging biodiversity or the extinction of some biodiversity which is in fact important for supporting the sustainability of the ecosystem, displacement of indigenous or local communities as a result of business expansion which results in new poverty as a result of adjusting the lives of indigenous people to life in urban areas. Flooding that occurs in urban areas as a result of increasingly dense housing, water absorption in pavement soils that exceed the threshold of the soil's ability to absorb water. Tidal flooding due to melting ice caps that submerges coastal areas and further inland. Extreme drought that causes crop failure, extreme rainfall in rainwater discharge resulting in crop failure.

There are still many industrial companies that have not implemented environmentally friendly production and management, so there are still very many company practices that produce waste that exceeds the capacity and carrying capacity of the environment, such as excess greenhouse gases produced so that the contribution to climate change by industrial activities is still widely found. This is related to the voluntary nature of the rules, which means that companies can freely prioritize profit alone rather than having to adjust to the elements of environmental preservation in the production process and business management, as a crucial result in industrial activities, namely the reduced profits obtained by companies if they have to pay attention to and implement regulatory policies that combine profit and environmental sustainability in order to realize community welfare. Voluntary rules are good because they are expected to cause more awareness if they are complied with than mandatory ones, which are complied with because it is not always awareness in complying with them, but more due to the fear effect.

Conclusions and Recommendations

The author argues that green industry has not been prioritized if you look at the provisions in the regulation in the industrial sector which actually provide sanctions without creating a deterrent effect on polluters because the regulation is voluntary. Voluntary in industrial activities can be faced with Article 3 of Law Number 3 Year 2014 by remembering the principle of balance. The principle of balance in industrial activities is known as economic democracy, ensuring that industrial activities are balanced with other things, such as the environment. The operation of industrial activities is closely related to the environment, so the polluter pays principle can be applied in industrial activities. The author sees the polluter

pays principle as a way to ensure that industrial activities do not damage or pollute the environment. This is because, in contrast to Indonesian practice, this principle means that pollution payments are made before industrial activities begin.

Development must pay attention to current and future generations in a good environment, natural resources and sustainable development, containing aspects of morality and across generations, lest only the current generation enjoy, while the next generation (children and grandchildren) do not enjoy a healthy environment. Thus, what is important is the basis in the form of the environment, natural resources, and then sustainable development. Sustainable development is regulated in laws and ministerial regulations. Thus, sustainable development is basically cross-generational development. The government through the legislature should pay attention to the harmony between industrial development and the preservation of environmental functions. Thus, industry is no longer an activity that causes environmental pollution. Industrial activities are indeed emphasized to provide benefits to society but must be in accordance with UUPPLH because basically there is a close relationship between the environment and industrial activities which are realized in the green industry.

In forming regulations, it must pay attention to the cultural, social side so that the actions that must be taken by the legislature, executive, and judiciary are to amend Law Number 3 of 2014 which has the potential to have a negative impact on the environment. The industrial law was formed during the Industrial Revolution 4.0 so that it still prioritizes technology without caring about the impact it has. The author's opinion is based on the principle of precautionare must be emphasized so that there are no environmental problems that result in large losses because the cost of environmental recovery is very large because by ignoring the environment, it has violated Article 28H of the 1945 Constitution which guarantees access to a healthy environment.

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Criminal Sanctions Against Parents for Children in Conflict With the Law

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Abstract

The post-COVID-19 era has brought significant social changes, particularly affecting parenting behavior, child supervision, and the psychological well-being of children. This study explores the imposition of criminal sanctions on parents whose children come into conflict with the law, analyzed through Jeremy Bentham's utilitarianism and the principle of "The Greatest Happiness of the Greatest Number." It highlights the implications of suboptimal parenting and its effect on rehabilitation efforts and the prevention of juvenile delinquency, with a core focus on the consequences of parental responsibility. Using a normative legal research method, this study examines the Juvenile Criminal Justice System Law, relevant statutory regulations, legal literature, and interview data. The findings suggest that applying criminal sanctions to parents, viewed from a utilitarian perspective, can act as a catalyst to strengthen parental supervision, encourage responsible parenting practices, and promote active involvement in preventing juvenile crimes. Data from January to July 2024 show that Indonesia recorded 185,557 criminal cases, with 17.7% involving children as perpetrators and 11.86% as victims. However, this approach also raises ethical concerns. Punitive measures risk creating social stigma, potentially undermining the family's essential role in child development. Therefore, the study recommends a more holistic and interdisciplinary approach—one that includes not only punitive mechanisms but also parenting education, psychosocial support, and restorative justice. These efforts should be rooted in the best interests of the child to ensure recovery for both children and parents. By integrating both accountability and support, the justice system can work toward greater societal well-being and happiness.

Keywords: children, crime, parents, family, law

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Background of the Problem

Parents play a vital role in shaping a child's character and social behavior, impacting both individual growth and social stability. Erikson (1950) stressed that parenting styles influence identity and emotional regulation. Positive parenting fosters self-control and social adaptability, while poor parenting raises the risk of deviance (Baumrind, 1967). In psychology and criminology, quality parenting strongly correlates with lower delinquency. Hirschi's Social Control Theory (1969) emphasizes that strong parent-child attachment and internalized norms prevent delinquency. Moffitt (1993) links inconsistent parenting to persistent antisocial behavior. Thus, strengthening parenting is a key strategy for crime prevention.

Legally, the issue of parental liability for juvenile delinquency remains a topic of debate. Several legal systems, including those in the United States and Canada, recognize the concept of *parental liability*, whereby parents may be held legally accountable for neglectful supervision. In Indonesia, Article 55 of the Indonesian Penal Code (KUHP) regulates the criminal liability of accomplices, which can, in certain circumstances, be applied to negligent parents. However, legal enforcement in Indonesia tends to prioritize preventive approaches through parenting education and child rehabilitation. A multi-sectoral approach—incorporating government, education systems, and social organizations—is necessary to support effective parenting. Empirical studies indicate that early interventions such as parenting training and psychosocial support effectively reduce the risk of delinquency (Farrington & Welsh, 2007). A synergy among family, community, and state institutions is critical in nurturing a responsible generation.

In criminological theory, social control is regarded as a principal determinant of juvenile delinquency. Hirschi's *Social Bond Theory* (1969) suggests that low emotional attachment between children and their families increases the probability of delinquent behavior. A lack of interpersonal relationships can push children toward negative affiliations. Sampson and Laub (1993) further reinforce that weak informal social control within the family strongly influences the development of criminal behavior. Family social control includes patterns of supervision and discipline. Unstable family conditions—such as divorce, conflict, or economic stress—often diminish parental supervision and increase children's exposure to negative influences. Children from dysfunctional families frequently struggle to develop effective self-control (Glueck & Glueck, 1950). Thus, family stability is a vital protective factor. Poor communication and suboptimal parenting can weaken the family's role in social control. Hirschi (1969) affirms that the absence of constructive interaction hinders the internalization of normative values. Bronfenbrenner (1979) also argues that an unsupportive family environment increases the likelihood of children encountering difficulties in forming healthy social relationships. The absence of authoritative role models further contributes to criminal behavior. According to Bandura's Social Learning Theory (1977), children learn by observing and imitating; the absence of positive figures makes children vulnerable to adopting deviant behaviors. The presence of such role models, along with support from educational institutions, community networks, and public facilities, strengthens social control mechanisms. Farrington (2002) asserts that early intervention and engagement in positive activities act as protective factors. Therefore, preventing juvenile crime requires a multidimensional strategy. Agnew (2006), through *strain theory*, adds that children's alienation and inability to cope with social stressors often lead to deviant behavior. Preventive strategies must reinforce positive interaction, communication, and a supportive social environment.

From a comparative legal perspective, parental legal responsibility for children's actions involves complex legal and social dynamics. It reflects moral principles and is central to juvenile justice systems (Feld, 1999). Jurisdictions vary in balancing individual responsibility with restorative justice to prevent crime and improve juvenile justice outcomes. The United States enforces parental accountability through legal sanctions for inadequate supervision (Zimring, 2005), grounded in vicarious liability and deterrence theory but criticized for reinforcing structural injustice. Conversely, Scandinavian countries like Sweden and Norway emphasize rehabilitation via social interventions, focusing on parental education and family guidance aligned with restorative justice principles (Duncan, 2018). Parental legal responsibility requires integrating normative, empirical, and policy perspectives. An ideal model balances parental accountability, children's rights, and justice system effectiveness, while considering socio-economic factors, family structures, and social interventions to ensure fairness and inclusivity (Siegel & Welsh, 2018).

In Indonesia, explicit legal provisions regarding parental criminal liability for the actions of their children remain undeveloped. The principle of *personal responsibility* (asas personalitas) forms the foundation of Indonesian criminal law. However, from a theoretical standpoint, parents' duty to guide and educate their children could have legal implications (Sudarto, 1983). Law No. 11 of 2012 on the Juvenile Criminal Justice System adopts a rehabilitative approach grounded in *the best interest of the child* and the principles of restorative justice (Marlina, 2009). While parents play a crucial role, Indonesia's legal system focuses more on rehabilitating the child than on directly punishing the parents.

Parental responsibility is acknowledged under Law No. 23 of 2002 on Child Protection, particularly in Article 26(1), which provides for administrative sanctions of an educational and preventive nature (Soetjiningsih, 2010). Several jurisdictions apply *strict liability* to parents (Cauffman & Steinberg, 2000), prompting discourse in Indonesia on whether a parental liability model could be adopted while maintaining a balance between rights and responsibilities.

The rising juvenile offender rate in Indonesia calls for a critical review of the criminal justice system, especially regarding parental responsibility. While some countries apply parental responsibility laws (Besharov, 2001), Indonesia favors rehabilitation, sparking debate. Sanctioning parents might improve supervision but risks injustice. Alternatively, strengthening family legal education and social institutions offers adaptive solutions. Research shows rehabilitation with social reintegration reduces recidivism more effectively than punishment (Zimring, 2015). Thus, parental responsibility policies should be comprehensive, considering legal, social, and cultural factors to ensure justice and effectiveness.

Research Methodology

This research adopts a normative legal research method with a juridical-comparative approach, enriched with empirical analysis to provide a holistic understanding of parental punishment in the context of the juvenile criminal justice system. The aim of this research is to examine the prevailing legal norms, explore the juridical rationale behind criminal policies towards parents for the actions of children in conflict with the law, and compare them with legal systems in various jurisdictions in order to find effective and fair policy solutions.

This research relies on two main categories of legal sources, which are examined systematically and critically: primary legal sources and secondary legal sources. Primary legal sources include binding domestic and international legislation, such as Law Number 11 of 2012 concerning the Juvenile Criminal Justice System, the Indonesian Penal Code (KUHP), the Convention on the Rights of the Child (UNCRC), and other international legal instruments such as the United Nations Standard Minimum Rules for the Administration of Juvenile Justice (Beijing Rules) and the United Nations Guidelines for the Prevention of Juvenile Delinquency (Riyadh Guidelines). Meanwhile, secondary legal sources are used to enrich theoretical perspectives and legal practice, including academic literature (books, dissertations, research results), scientific journals and recent legal articles, as well as court decisions from various levels that provide precedents and judicial considerations.

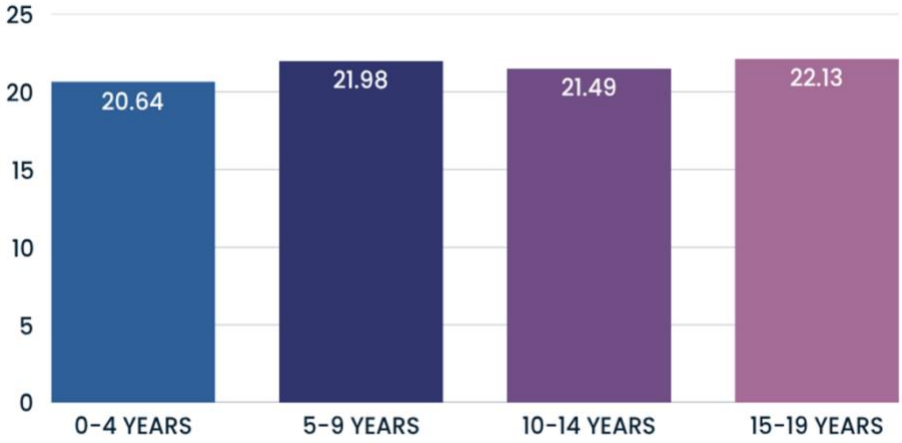
The juridical-comparative approach is applied to analyze the implementation of laws in several countries with different legal characteristics, in order to obtain a comprehensive understanding of policies regarding parental punishment. The countries compared include the Netherlands (with an approach based on parental responsibility in civil and criminal systems oriented toward rehabilitation), the United States (particularly states that adopt parental liability laws for neglecting child supervision), and Germany (which emphasizes a more social-rehabilitative approach through supervision and social intervention programs). Through this comparison, the research will identify the strengths and weaknesses of each legal model, as well as examine the possibility of adopting a model suitable to the Indonesian legal system.

While grounded in a normative approach, this study is supported by empirical analysis to examine the link between parenting patterns and juvenile crime. It uses case studies from court rulings and child protection reports to explore family influences on delinquency. Criminal statistics and data assess the impact of socio-economic status and parenting on youth crime rates. Interviews with judges, prosecutors, advocates, and juvenile law experts provide insights on parental punishment policies. Combining normative and empirical methods, the research aims to enrich criminal law policy by considering both legal frameworks and underlying social-psychological factors.

Discussion

Post-pandemic social changes following COVID-19 have had a significant multidimensional impact on parenting patterns. The pandemic not only disrupted the economic and educational sectors but also fundamentally altered social interactions within families. Mobility restrictions, the implementation of online learning systems, and economic pressures experienced by many households have reduced the quality of parental supervision over their children. The impact of these conditions is reflected in the increasing involvement of children in criminal acts, which calls for an in-depth evaluation of the role of parents in preventing juvenile delinquency.According to data from Indonesia’s Central Statistics Agency (BPS) in 2024, the number of children aged 0–19 years in Indonesia is 88.24 million. This age group accounts for approximately 31.3% of Indonesia’s total population of 281.60 million people in 2024. This data highlights that nearly one-third of Indonesia’s population consists of children, emphasizing the critical role of parents in shaping children's character and behavior. Given this significant number, preventive and educational approaches in parenting are crucial to preventing children’s involvement in legal conflicts.

Figure 1
Proportion of Children Aged 0–19 Years in Indonesia's Population (2024)



Source: Adapted from Badan Pusat Statistik (2024)

The shift in parenting patterns after COVID-19 shows that the pandemic forced parents to spend more time at home and accompany their children, but it also brought new challenges such as stress, fatigue, and psychological pressure due to work burdens and online learning. Most parents applied a democratic parenting style, but permissive parenting also increased, giving children more freedom without adequate supervision. Parents tended to adapt by using technology for education and entertainment, but increased screen time often reduced direct interaction, leading to decreased attention to children. Economic pressure, health concerns, and changes in routine made parents more vulnerable to stress and less patient, causing children to feel emotionally neglected even though their parents were physically present more often. After the easing of social restrictions, parents became busier outside the home again, leading to a decline in quality time with their children and a renewed risk of lack of attention and supervision.

Data from KPAI in 2020 shows that child supervision during home learning was more often carried out by mothers than by fathers.

Figure 2
Activities Guidance While Learning at Home

ACTIVITIES GUIDANCE WHILE LEARING AT HOME (KPAI, 2020)

	ALWAYS	OFTEN	SOMETIMES	RARELY	NEVER
FATHER	10,8%	18,9%	32,7%	16,6%	21%
MOTHER	32,6%	32,6%	25,8%	10,4%	11,2%

Source: Komisi Perlindungan Anak Indonesia (KPAI), 2020

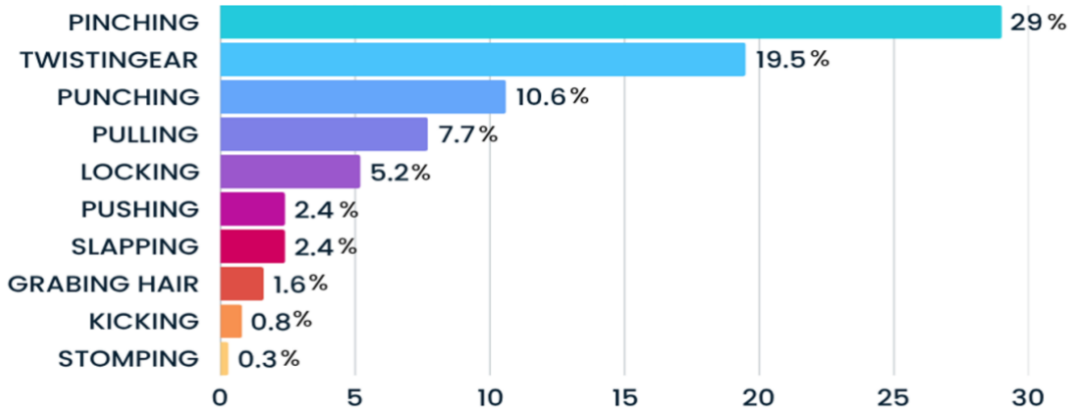
Figure 3
Activities Guidance Besides Learning

	ALWAYS	OFTEN	SOMETIMES	RARELY	NEVER
FATHER	11,1%	23,4%	31,9%	16,1%	17,5%
MOTHER	15,6%	31,9%	28,7%	12,1%	11,7%

Source: Komisi Perlindungan Anak Indonesia (KPAI), 2020

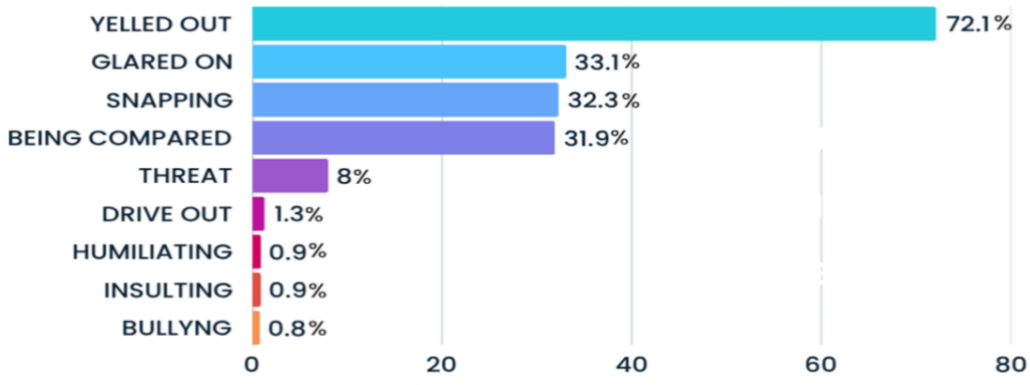
During the pandemic, children also experienced physical and psychological abuse by their parents. The most prevalent forms of physical abuse were pinching (29%), flicking (19.5%), and hitting (10.6%). Meanwhile, the most dominant forms of psychological abuse included scolding (72.1%), glaring (33.1%), and shouting (32.3%).

Figure 4
Monthly Trend of Children Registered as Suspects (2024)



Source: Data compiled from national child protection reports (2024)

Figure 5
Types of Crimes Committed by Children



Source: Data compiled from child protection reports (KPAI, 2024).

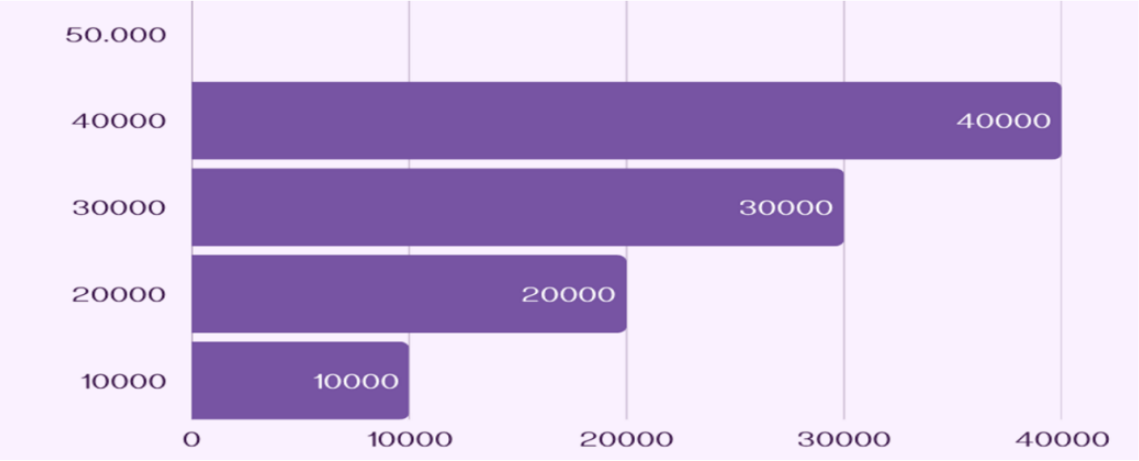
Social transformation has affected family social control dynamics. Pandemic-related economic instability made it harder for many parents to fulfill their roles effectively. This, combined with growing social inequality, increased vulnerability to negative influences like crime in certain communities. Therefore, examining how economic hardship weakens family social control is essential to understanding rising juvenile delinquency rates (Shoemaker & Wolfe, 2016).

From the perspectives of developmental psychology and criminology, there is a strong correlation between parenting strategies employed by parents and children's propensity to engage in delinquent behavior. Research indicates that negative parenting (characterized by unclear structure, authoritarianism, or permissiveness/indulgence) can hinder the internalization of social values, discipline, critical thinking, and wise decision-making in children, thereby contributing to an increase in juvenile delinquency cases.

The surge in juvenile crime rates following the pandemic demonstrates that modern family structures increasingly face challenges in fulfilling their primary socialization functions. The weakening of informal social control mechanisms within the family renders children more vulnerable to involvement in criminal activities. Several studies indicate that children raised in unstable family environments or under inadequate supervision are more likely to engage in criminal acts compared to those raised in supportive environments with effective parenting (Parker, 2018).

Data on children in conflict with the law from January to July 2024 indicates a total of 40,079 children involved, with the following details:

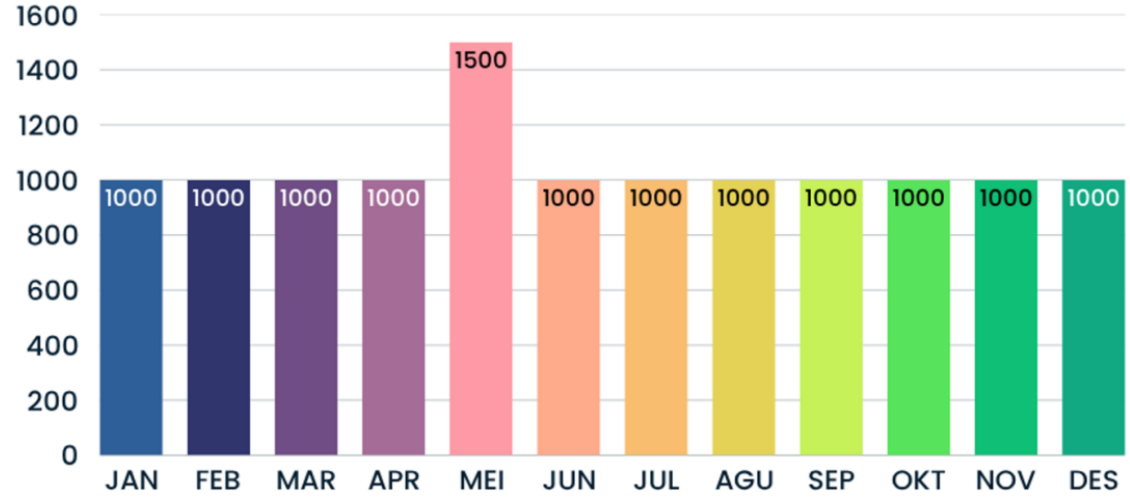
Figure 6
Children in Conflict With the Law in Indonesia (January – July 2024)



Source: Data compiled from national child protection reports (2024)

On average, approximately 1,000 children were registered as suspects each month in 2024, with the highest peak occurring in May 2024, involving 1,481 children.

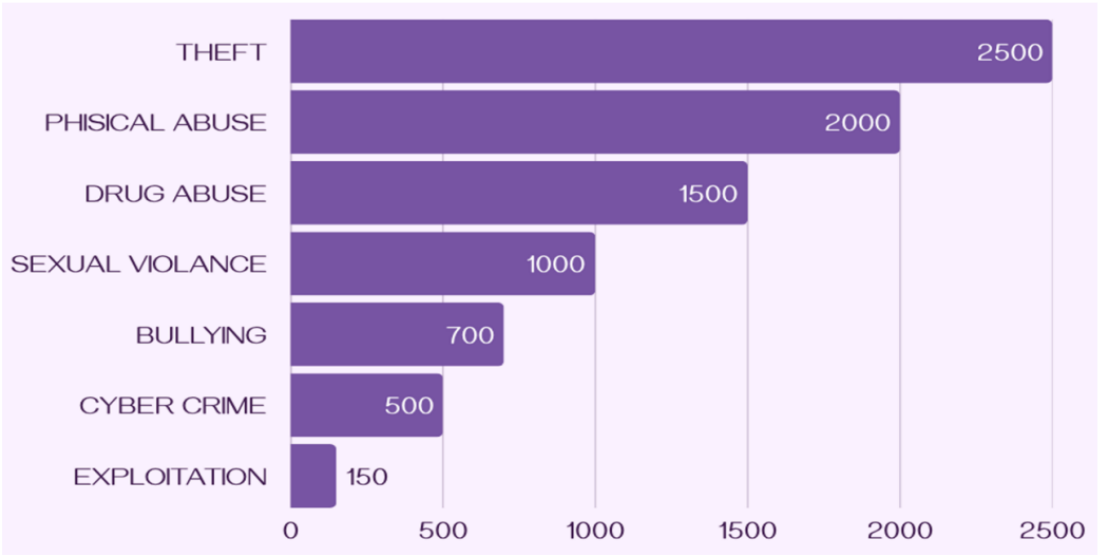
Figure 7
Monthly Trend of Children Registered as Suspects (2024)



Source: Data compiled from national child protection reports (2024)

The most frequently committed crimes by children are theft, followed by physical violence/assault, and drug abuse. Sexual violence/offenses and bullying are also prominent. Cybercrimes and exploitation occur less frequently but remain a cause for concern.

Figure 8
Types of Crimes Committed by Children



Source: Data compiled from child protection reports (KPAI, 2024)

In this context, the concept of parental responsibility laws emerges as a pertinent subject for further examination. Several countries have adopted such policies as a means to enhance parental accountability in child-rearing. By imposing legal consequences on parents who neglect their supervisory duties, it is anticipated that parental responsibility will increase, thereby fostering an environment conducive to the moral and social development of children. However, the implementation of parental responsibility laws in Indonesia requires more comprehensive analysis to ensure alignment with the local legal system and cultural context.

The Implementation of Criminal Sanctions on Parents of Children in Conflict With the Law From the Perspective of Jeremy Bentham's Utilitarianism

In criminal law discourse, the principle of individual liability constitutes a fundamental premise, underscoring that criminal sanctions may only be imposed on those who have directly committed the criminal act. However, in certain jurisdictions, the concept of parental responsibility laws has been adopted as a policy instrument to address the high incidence of juvenile delinquency. From the perspective of Jeremy Bentham's utilitarianism, this policy can be analyzed through the principle of *"The Greatest Happiness of the Greatest Number,"* which emphasizes that laws should be designed to maximize social welfare (McHugh, 2008, p. 1). Bentham's utilitarianism is grounded in consequentialism, meaning that the legitimacy of a legal policy is measured by its positive impact on society. The implementation of parental responsibility laws aims to enhance parental accountability in child-rearing and directly reduce the potential involvement of children in criminal acts. Should parents understand that negligence in supervision may result in criminal sanctions, an incentive is created for more attentive monitoring of their children's behavioral development (Hanafy, 2021, p. 1).

Within the Indonesian legal system, the imposition of criminal sanctions on parents remains a complex and contested issue. Articles 55 and 56 of the Indonesian Penal Code (Kitab Undang-Undang Hukum Pidana—KUHP) stipulate that a person may only be held criminally responsible if proven to have participated or assisted in the commission of a criminal offense. However, Indonesian law has yet to explicitly accommodate the concept of parental responsibility laws, except in cases of child exploitation as regulated under Law Number 35 of 2014 on Child Protection, particularly Article 76I. Therefore, the adoption of parental responsibility laws within Indonesia's criminal law framework necessitates legal reforms that consider the principles of proportionality and justice.

From a utilitarian framework, this policy must be evaluated based on its benefits and potential adverse impacts on society. One principal benefit is the increased awareness among parents regarding the importance of supervising their children as a preventive measure to reduce juvenile delinquency and crime rates. Conversely, the enforcement of parental responsibility laws may impose a heavier burden on impoverished families who lack adequate resources for optimal child-rearing. In such circumstances, Bentham's principle of the felicific calculus becomes highly relevant, as laws implemented must generate social benefits that outweigh the potential suffering caused (Warke, 2000, p. 20).

The principle of proportionality is crucial in imposing criminal sanctions on parents. Bentham highlights that law's effectiveness depends on balancing punishment with societal benefits (McHugh, 2008). Rigid application of parental responsibility laws risks discriminating against disadvantaged groups. Therefore, mitigation through parental guidance and social interventions for high-risk families is necessary. Comparative examples show varied approaches: some U.S. jurisdictions use administrative sanctions, while the U.K. favors social interventions before criminal penalties (Ministry of Justice UK, 2009). Success depends on coordination among the justice system, schools, and social welfare agencies.

Effective implementation of parental responsibility laws in Indonesia requires a balance between punitive and preventive measures. Criminal sanctions should be a last resort, while social interventions and educational programs take priority in promoting parental responsibility. The law should act not only as punishment but also as guidance and

prevention. First, comprehensive empirical research is needed to evaluate the legal, social, and economic impacts to avoid unintended harm. Collaboration among academics, legal experts, and child protection agencies is essential to align policies with Indonesia's social and cultural context.

Considering the above factors, the implementation of parental responsibility laws in Indonesia must proceed with caution and be evidence-based. Bentham's utilitarian principle demands that legal policies confer the greatest benefit to the broader society. Therefore, a combination of social interventions and proportionate legal regulations is the key to establishing a more just and effective legal system that safeguards the welfare of children and society as a whole.

The Principle of Parental Criminal Liability in the Indonesian Legal System

Within the framework of Indonesian criminal law, the principle of individual liability constitutes the fundamental pillar of criminal responsibility, affirming that an individual is accountable for actions committed directly with the element of fault (*mens rea*). This principle, consistent with the Indonesian Penal Code (Kitab Undang-Undang Hukum Pidana—KUHP), does not automatically associate parental criminal liability with the criminal acts committed by their children. The KUHP, particularly Articles 55 and 56, governs participation in criminal acts as principal offenders, accomplices, or participants, without explicitly affirming parental criminal responsibility for the child's offenses. In Indonesia, cases of parental neglect are more commonly addressed through civil law or child protection regulations.

Sudarto emphasizes that Indonesian criminal law focuses on the individualization of punishment as a manifestation of the principle of legality and fault, tending to adopt a repressive stance against offenders without adequately considering environmental and social factors (Sudarto, 1983). Internationally, parental responsibility laws have emerged as a trend to enforce parental accountability. In the United States, certain jurisdictions, such as California, impose criminal sanctions on parents proven negligent in supervising their children, leading to criminal acts (Zimring, 2005). This approach aims to increase parental awareness and responsibility while reducing juvenile delinquency. However, criticisms arise regarding potential violations of the principle of personal guilt within modern criminal law (Garland, 2001), and the effectiveness of such laws remains debated, considering that juvenile delinquency is influenced not only by parenting but also by social and economic environments.

In Indonesia, under civil law and child protection frameworks, Law Number 35 of 2014 on Child Protection mandates a constitutional obligation for parents to guide, supervise, and protect their children. Failure to fulfill these obligations may result in administrative or criminal sanctions; however, the primary focus remains on child protection. Enforcement in such cases faces challenges, particularly in proving the causal relationship between parental negligence and the child's criminal behavior.

From an Islamic legal perspective, criminal liability similarly remains individual, though there is moral and social responsibility placed upon parents for child education. Some Islamic countries, such as Saudi Arabia and Iran, permit parental liability if negligence in moral education leads to a child's involvement in criminality (Kamali, 2008), reflecting the normative and moral nature of this responsibility. The concept of strict liability is also

pertinent in comparative criminal law, where jurisdictions like England and Canada apply it to parents negligent in supervising children who commit crimes. For instance, in England, parents may be fined or face civil penalties if their children repeatedly engage in criminal acts. Nonetheless, the application of strict liability is contested among criminal law scholars due to its potential conflict with the fault principle (Simester & Sullivan, 2016), possibly resulting in injustice by penalizing parents for acts beyond their control.

Sociologically, parental supervision and guidance show significant correlation with juvenile delinquency tendencies. Studies indicate that children lacking adequate parental supervision and guidance are more vulnerable to engaging in criminal conduct (Hirschi, 1969). Therefore, although Indonesian criminal law has yet to explicitly adopt parental responsibility laws, policies that strengthen parental roles in child guidance and supervision merit consideration within national criminal law reforms. Indonesia could contemplate progressive policies to regulate parental responsibility for children in conflict with the law, but such regulations must be carefully formulated to balance the principles of legality, fault, and human rights protection to avoid injustice.Legal reform should be grounded in empirical studies evaluating the effectiveness of parental responsibility laws in various countries. Comprehensive and multidisciplinary research into the legal basis and principles of parental criminal liability in Indonesia is imperative. Given the increasingly complex social dynamics, criminal law must adapt to address challenges in child development and juvenile delinquency prevention. Consequently, the discourse on implementing parental responsibility laws requires thorough and holistic examination to enhance the legal system's effectiveness in upholding justice and protecting children.

Comparative Study of Regulations in Other Countries

Comparative criminal law studies show major differences in parental liability for children's crimes across jurisdictions. Approaches range from direct criminal sanctions to rehabilitative social interventions, shaped by each country's legal philosophy, criminology, children's rights, social policies, and cultural factors.

In the United States, several states enforce Parental Responsibility Laws holding parents legally accountable for their children's crimes. Sanctions can include administrative penalties, fines, or criminal charges for negligent supervision (Scott & Grisso, 2005). This is based on social control theory, which sees family as key in shaping behavior and neglect as a cause of delinquency (Hirschi, 1969). Studies show mixed results: some areas see lower juvenile crime, others little change.

In contrast, France adopts an administrative approach to parental responsibility. Rather than explicit criminal penalties, it employs social oversight mechanisms that require parents to ensure a conducive environment for their children's moral and social development (Mucchielli, 2008). This approach aligns with rehabilitation theory, focusing on social intervention and community-based crime prevention. French policy is considered more effective in the long term due to its emphasis on social guidance rather than punishment, offering parental coaching programs for those who fail in their responsibilities.

The Netherlands embraces a restorative justice paradigm within its juvenile justice system, prioritizing rehabilitation and education. Parental involvement in recovery programs is pivotal for enhancing understanding of effective parenting styles and strengthening social responsibility (Van der Laan & Blom, 2011). This model corresponds with positive parenting

principles, positioning parents as primary agents in shaping child behavior and preventing early criminality through psychological counseling, social work, and community activities.

Similarly, Germany emphasizes social interventions in juvenile offenses, favoring rehabilitative and community-based approaches over penal sanctions directed at parents (Dünkel, 2014). This model reflects a minimalist sentencing principle to avoid the negative consequences of repressive punishment, promoting social reintegration as a strategy to prevent recidivism. Supported by comprehensive child welfare services, this approach reduces the risk of children engaging in deviant behavior.

Parental responsibility in juvenile justice differs widely across countries. The U.S. favors punitive legal accountability, while European nations focus on prevention and rehabilitation. Comparative studies show that rehabilitative models are more effective at reducing juvenile reoffending. Holistic systems with strong social welfare achieve better long-term results. Thus, reform efforts should balance justice, rehabilitation, and child rights based on evidence.

Social and Legal Impacts

The imposition of criminal sanctions on parents for their children's unlawful conduct carries broad social and legal consequences, presenting significant challenges in formulating a just criminal justice policy. Criminological and criminal law perspectives emphasize the importance of proportionality and restorative justice principles within the concept of criminal responsibility.One prominent impact is social stigma directed at parents and their families. Goffman (1963) explains that stigma can trigger marginalization and exclusion, obstructing social reintegration. Parental punishment has the potential to exacerbate stigma, not only affecting the parents but also their children, thereby intensifying the cycle of criminality and complicating rehabilitation efforts. Such stigma may even lead to structural exclusion, hindering access to education, employment, and rehabilitative services.

Another significant consequence involves the psychological effects on children and families. Siegel and Welsh (2018) demonstrate that separation from parents due to incarceration can impose severe emotional stress on children, disrupting their psychosocial development. Bowlby (1969) underscores the importance of emotional attachment between children and parents for psychological stability, thus criminal sanctions against parents may increase the risk of mental and social disorders in children. This approach potentially conflicts with the best interests of the child principle enshrined in the UN Convention on the Rights of the Child (1989), which emphasizes rehabilitation over retribution (UNICEF, 2020). Parental incarceration may deteriorate child welfare and caregiving, escalating juvenile delinquency due to weakened family support systems.

This policy also increases the criminal justice system's burden. Garland (2001) notes that more incarceration worsens prison overcrowding, weakens rehabilitation, and raises state costs. Handling cases involving parents slows judicial efficiency and delays humane, restorative reforms. Furthermore, punishing parents harms family dynamics. Bowlby (1969) highlights the parent-child bond's role in emotional development. Sanctions can disrupt caregiving, raise the need for alternative care, and increase children's risk of reoffending due to less supervision and support.

From a legal standpoint, implementing such policies provokes debate regarding the principles of criminal responsibility. Criminal law doctrine requires punishment only for individuals

directly responsible for criminal acts (Muladi & Arief, 2013). Consequently, penalizing parents for their children's offenses may contradict the principle of individualized criminal liability, creating a dilemma between retributive and corrective justice. Other implications concern human rights and proportionality. Rawls (1971) emphasizes that legal policies must consider substantive justice to protect individuals from disproportionate repressive measures. In this context, criminal sanctions against parents may be inconsistent with inclusive and balanced justice principles.

In conclusion, policies criminalizing parents for their children's delinquent acts generate complex social, psychological, and legal consequences. Stigmatization, adverse psychological impacts on children, conflicts with the best interests of the child, and increased strain on the justice system are critical factors requiring careful consideration. Therefore, evidence-based approaches and comprehensive policy evaluations are essential to ensure a balance between legal interests, social justice, and child rights protection.

Conclusion and Recommendations

Conclusion

The increase in juvenile delinquency cases post-COVID-19 highlights the crucial role of parents in preventing youth misconduct. The pandemic has caused a decline in parental supervision, increased psychological stress on children, and changes in parenting patterns, which correlate with a rise in deviant behavior. Data from 2024 indicates that children constitute nearly one-third of Indonesia's population, underscoring the urgency for effective parenting strategies. The high incidence of physical and psychological violence experienced by children during the pandemic has further exacerbated the situation.This study, viewed through Jeremy Bentham's utilitarian perspective, suggests that imposing criminal sanctions on parents can act as a catalyst for greater accountability and improved supervision, ultimately aiming to maximize social welfare by reducing juvenile crime rates.

However, the implementation of such sanctions presents complex ethical dilemmas. While it may encourage parental supervision, these sanctions risk social stigma and place additional burdens on vulnerable families, potentially weakening the family's role as the primary social unit for child-rearing. Indonesia's current criminal law system is based on the principle of individual liability and does not explicitly regulate parental criminal responsibility except in cases of child exploitation. Comparative analysis with other countries reveals a variation in approaches; some U.S. jurisdictions adopt more punitive parental responsibility laws, whereas European countries tend to employ rehabilitative and social intervention models, which often prove more effective in the long term.Negative social and psychological impacts such as stigmatization, emotional stress on children, and increased burden on the justice system must be carefully considered.

Recommendations

Policies on parental responsibility should be comprehensive and interdisciplinary, encompassing not only sanctions but also parenting programs, psychosocial support, and restorative approaches. This aligns with the best interests of the child principle and facilitates recovery. The primary approach should focus on strengthening social interventions and educational programs for parents. Criminal sanctions should serve as an ultimum remedium (last resort), while preventive strategies and guidance programs should take

precedence.Comprehensive empirical studies are needed to evaluate the potential impact of implementing parental responsibility laws in Indonesia, taking into account legal, social, and economic dimensions. The adopted model must be balanced with local social and cultural contexts.Synergy between the criminal justice system, educational institutions, and social welfare agencies is essential to create a fair and effective legal system aimed at maximizing the overall happiness and welfare of society.

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Navigating the Arctic and Antarctic: The ASEAN Plus Three Approach

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Abstract

This paper examines the development of interregional relations within the ASEAN Plus Three (APT) framework, focusing on the evolving Arctic and Antarctic policies of APT countries in the 21st century. It argues that the polar regions have emerged as significant areas of cooperation, driven by shared environmental and economic interests in response to climate change and geopolitical shifts. The unique vulnerabilities of ASEAN countries resulting from their susceptibility to the effects of global warming establish a foundation for mutual engagement in the Arctic. To verify the research hypotheses, the study will: (1) identify the key strategic goals of APT states, both explicit and implicit; (2) reconstruct processes indicating increased interest and presence in the Arctic, including participation in international polar stations, enhancement of research infrastructure, and establishment of Arctic centers; and (3) conduct a diagnosis of the institutionalization of political and economic mechanisms in APT countries concerning regional issues. The study analyzes the roles of key state and non-state actors in shaping APT's multilateral engagement in the Arctic, emphasizing their diplomatic, scientific, and economic strategies. Employing qualitative analysis and a comparative methodology grounded in post-colonial theory, it highlights both convergent and distinct elements of APT polar policies. Findings suggest that APT countries are increasingly aligned in their approach to Arctic sustainability, with climate action as a central rationale. The paper illustrates how APT's collective strategy integrates national interests with commitments to environmental stewardship, positioning the group as a constructive force in polar governance.

Keywords: ASEAN Plus Three, Arctic, Antarctic, multilateralism, diplomacy

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Introduction

The accelerating environmental transformations in the Arctic and Antarctic are no longer issues confined to the polar regions—they are deeply intertwined with the security, prosperity, and sustainability of regions far beyond the poles, including East and Southeast Asia. For the ASEAN Plus Three (APT)—comprising the ten ASEAN member states along with China, Japan, and South Korea—this linkage is increasingly critical. As global climate patterns shift due to polar ice melt and ocean warming, APT countries are confronted with immediate and cascading effects on food security, maritime stability, economic continuity, and climate resilience. Historically peripheral to polar discourse, APT nations now find themselves at a geopolitical and environmental crossroads where engagement with polar science, governance, and resource dynamics becomes indispensable. The rapid decline of polar ice is disrupting global ocean circulation systems and atmospheric patterns, with direct consequences across Asia's monsoons, agricultural cycles, and fishery zones. Simultaneously, the poles are becoming contested geopolitical arenas, where new shipping routes and marine resources are reshaping global strategic maps. In this evolving context, the APT's collective approach to navigating the polar regions is not merely a strategic option—it is a policy imperative grounded in survival, sustainability, and influence in the Anthropocene.

Climate Impacts Driving Polar Interest

Although the Arctic and Antarctic are geographically distant from the APT region, their climatic and geopolitical relevance is increasingly apparent. The accelerating pace of climate change, particularly the rapid loss of polar ice, is triggering far-reaching environmental consequences that extend well into East and Southeast Asia. This growing interconnectedness between the poles and APT is underpinned by the fact that most APT nations—excluding landlocked Laos—are coastal states with high population densities, critical infrastructure concentrated in low-lying areas, and economies that rely heavily on maritime trade. Coastal cities such as Jakarta, Manila, and Bangkok are already experiencing recurrent and severe flooding events, exacerbated by rising sea levels driven in part by melting Arctic sea ice and Antarctic glaciers (C40 Cities, 2019). Sea level rise is not only a hazard to infrastructure but also a major threat to freshwater resources, as saltwater intrusion affects both aquifers and coastal farmlands, thereby compromising food production and potable water supplies (IPCC, 2023).

Beyond the coastlines, the climatic repercussions of polar melt are reshaping regional atmospheric and oceanic systems. Notably, the weakening of the Atlantic Meridional Overturning Circulation (AMOC)—partly linked to freshwater influx from Greenland and Antarctic ice sheets—is disrupting the South and East Asian monsoon cycles, upon which millions of livelihoods depend (Cai et al., 2014). These monsoons are vital for the cultivation of rice, the staple food for much of the APT population. Increasing variability in rainfall, unpredictable droughts, and altered growing seasons are already reducing agricultural yields, leading to growing concerns about long-term food security across the region. Furthermore, polar warming contributes to changes in ocean temperatures and currents, which in turn affect marine ecosystems and the distribution of fish stocks. Given that more than 70% of dietary animal protein in many APT countries derives from fish and other aquatic resources (FAO, 2022), such ecological shifts are deeply consequential.

The sustainability of fisheries is under additional stress from local overfishing, pollution, and habitat degradation, which have depleted nearshore stocks and forced many nations to extend

their fishing efforts into distant and increasingly fragile ecosystems. China's distant-water fishing industry, which reported catches exceeding 2.3 million tons in 2022, increasingly targets sub-polar and polar regions as local resources decline (Shi, 2023). Similarly, the Southern Ocean has witnessed record levels of krill harvesting to supply Asia's expanding aquaculture sector, raising concerns over the health of Antarctic marine ecosystems that play a foundational role in the global carbon cycle and food webs (Nicol et al., 2012). These shifts signal an emerging dependence on polar biodiversity, which is becoming increasingly embedded in regional food security strategies.

Simultaneously, the Arctic is emerging as a pivotal zone for global maritime logistics. Melting sea ice is opening up the Northern Sea Route and other transpolar passages, presenting potential alternatives to traditional routes like the Strait of Malacca. For APT countries—many of which serve as key nodes in global supply chains—this raises strategic concerns. The development of Arctic shipping lanes could diminish the relative economic and geopolitical importance of Southeast Asian ports, leading to shifts in trade flows, investment patterns, and regional influence (Lasserre & Cyr, 2022). Additionally, any disruption to maritime stability, whether due to environmental risks or new geopolitical tensions in polar waters, poses immediate economic threats to APT nations that rely on uninterrupted seaborne commerce. Thus, the climate-induced transformations occurring at the poles are not abstract or distant for the ASEAN Plus Three. They present concrete and urgent risks that intersect with the region's most pressing challenges: environmental vulnerability, food and water insecurity, economic resilience, and geopolitical positioning. As such, active engagement with polar science, resource governance, and climate diplomacy is not merely desirable but essential. Without informed and coordinated APT strategies addressing the implications of polar change, regional adaptation efforts will remain reactive and insufficient in the face of escalating global climate disruptions.

ASEAN Plus Three Political Framework

The ASEAN Plus Three framework—comprising the ten member states of the ASEAN along with China, Japan, and South Korea—was originally conceived as a mechanism for fostering regional stability, economic integration, and functional cooperation in East Asia. Established in the aftermath of the 1997 Asian Financial Crisis, APT has since expanded its scope to include dialogues on a range of transboundary issues, including climate change, disaster risk reduction, and sustainable development. However, when it comes to addressing complex and geographically distant challenges such as those posed by the polar regions, the institutional architecture of APT reveals significant limitations. The core of these constraints lies in ASEAN's foundational principles, most notably the doctrine of non-interference and decision-making by consensus. While this approach has proven effective in minimizing intra-regional tensions and ensuring inclusivity, it often results in outcomes that are non-committal, lowest-common-denominator in nature, and lacking in enforceable mechanisms (Acharya, 2014).

Summit-level declarations and joint communiqués routinely acknowledge the urgency of climate change and the need for environmental cooperation. For example, the ASEAN Plus Three Leaders' Statement on Strengthening Environmental Cooperation for Sustainable Development issued in 2021 affirms the collective intention to enhance collaboration on environmental governance, biodiversity conservation, and climate mitigation. However, such documents tend to be aspirational rather than operational, offering few actionable commitments or institutional follow-through (ASEAN Secretariat, 2021a). This disconnect

between rhetoric and implementation is characteristic of ASEAN-led diplomacy, where the process of consensus-building and symbolic reaffirmation often overshadows concrete outcomes (Jetschke & Murray, 2012). Consequently, APT's capacity to articulate and pursue a unified strategy on issues like Arctic governance, climate adaptation, or biodiversity protection remains limited.

Moreover, when high-stakes, multidimensional issues such as polar science, shipping routes, or distant-water fishing arise, APT members frequently pursue unilateral or bilateral strategies, often aligning with major external powers. China, in particular, exerts considerable influence within the framework and tends to act as both participant and autonomous actor in polar affairs. As a result, ASEAN functions more as a platform for dialogue than as a cohesive geopolitical actor capable of formulating and executing collective environmental strategies (Koga, 2018). The disparity in capacities and priorities among APT members further complicates coordinated action. For example, while Japan and South Korea possess advanced polar research infrastructure and formal observer status in the Arctic Council, many ASEAN states lack the technical, financial, or strategic bandwidth to engage meaningfully in polar governance processes. This asymmetry reinforces the tendency toward fragmented responses and undermines the potential for a coherent APT approach to emerging polar risks. While the ASEAN Plus Three framework offers valuable diplomatic space for environmental dialogue, its structural and political limitations hinder the development of robust, unified strategies for engaging with polar climate dynamics. The urgency and complexity of polar-induced challenges—ranging from sea-level rise to shifting trade routes—demand a level of institutional agility and strategic coherence that APT, in its current form, struggles to provide. Without institutional reform or enhanced policy convergence among its members, APT risks remaining a reactive forum rather than a proactive force in global environmental governance.

National Polar Strategies: Divergence Over Unity

Despite being grouped under the ASEAN Plus Three framework, the member states show considerable divergence in their approaches to polar engagement, with little evidence of coordinated regional strategy. China, Japan, and South Korea—the "Plus Three" states—each pursue national polar strategies informed by their respective geopolitical interests, technological capacities, and global ambitions. China’s 2018 white paper *China’s Arctic Policy* is the most assertive among them. It identifies China as a “near-Arctic state” and articulates a vision of the Arctic as integral to China’s future, outlining priorities such as the development of Arctic shipping lanes (notably the Polar Silk Road), the expansion of scientific research, and the pursuit of resource extraction opportunities (State Council of the PRC, 2018). These ambitions are supported by considerable investments in polar infrastructure, including a growing fleet of icebreakers and research stations such as the “Yellow River Station” in Ny-Ålesund, Svalbard. China also participates actively in polar governance forums, including as an observer in the Arctic Council, and has been increasingly assertive in shaping norms around the use of international Arctic sea routes (Liu, 2018).

By contrast, Japan and South Korea approach polar affairs primarily through the lens of science diplomacy. Japan, through the National Institute of Polar Research, has maintained a strong presence in Antarctica since the 1950s and engages in Arctic research under the Japan Arctic Research Network Center. Its emphasis remains on climate science, environmental monitoring, and international collaboration rather than geopolitical maneuvering (Arctic Institute, 2020). South Korea, similarly, has invested in polar research through institutions like the Korea Polar Research Institute (KOPRI), operating the *Araon* icebreaker and

maintaining research stations in both poles. Though Seoul issued a *Basic Plan for Arctic Policy* in 2013, its tone remains cautious, positioning South Korea as a "contributor to international cooperation" rather than a strategic actor (Kim & Stenport, 2021). Both Japan and South Korea emphasize multilateralism and soft power in their polar policies, contrasting sharply with China's more expansive and strategic engagement.

Within ASEAN, the disparity is even more pronounced. Singapore stands out as the only ASEAN member with a coherent and proactive Arctic engagement strategy. As a low-lying, trade-dependent island state, Singapore views polar developments—especially those affecting sea level rise and global maritime trade routes—as directly relevant to its national interests. Singapore holds observer status in the Arctic Council, participates in the Arctic Circle Assembly, and has articulated a forward-leaning position on Arctic governance and climate resilience (Storey, 2016). In stark contrast, most other ASEAN countries lack formal polar policies altogether. Countries such as Vietnam, Thailand, Indonesia, and Malaysia either do not participate in polar governance or do so only intermittently through scientific cooperation or multilateral development partnerships. Their limited involvement is generally mediated by relationships with larger powers, such as China or Japan, rather than being guided by national strategic priorities.

This fragmentation results in a regional landscape where individual states pursue their own polar engagements—or none at all—without coordination or shared objectives. In practice, this weakens ASEAN's collective voice in global forums where polar issues are increasingly tied to climate policy, maritime security, and resource governance. More importantly, the absence of a unified stance opens the door for major powers to shape the regional agenda. China's growing presence in Southeast Asia, both economically and diplomatically, has positioned it as the primary external actor through which many ASEAN states engage on polar-related issues. This dynamic risks entrenching asymmetrical dependencies and undercuts the possibility of ASEAN developing a more autonomous or coherent approach to global climate governance.

The divergence of national strategies within the APT underscores a broader structural challenge: while the polar regions are of growing importance to the region's security and prosperity, there is no institutional mechanism within ASEAN or APT capable of aligning national interests into a collective polar strategy. Without such a framework, member states will continue to act independently, often influenced by the priorities of external powers, limiting the region's ability to shape or respond to the changing geopolitics of the Arctic and Antarctic.

Institutional Presence in Polar Affairs

ASEAN Plus Three countries exhibit substantial disparities in their institutional presence and engagement in polar affairs, reflecting broader asymmetries in scientific capacity, foreign policy orientation, and strategic prioritization across the region. The East Asian states—China, Japan, and South Korea—maintain robust and long-standing institutional infrastructures dedicated to polar research and governance. China leads the region in terms of operational scale, with six polar research stations under the administration of the Polar Research Institute of China (PRIC). Five of these are located in Antarctica—including the Great Wall, Zhongshan, Kunlun, Taishan, and Qinling stations—while the Yellow River Station in Svalbard, established in 2004, supports a wide range of Arctic climate and environmental studies (Brady, 2017; PRIC, 2023). China's investment in polar capabilities is

further reinforced by a growing icebreaker fleet and increasing diplomatic activity in polar multilateral forums, such as the Antarctic Treaty Consultative Meetings and the Arctic Council (where it holds observer status).

Japan has similarly institutionalized its polar engagement through the National Institute of Polar Research (NIPR), a globally recognized center for scientific excellence that coordinates Japan's Antarctic operations. Its flagship station, Showa Station, located on East Ongul Island in Antarctica, has been operational since 1957 and supports multidisciplinary research in glaciology, atmospheric sciences, and marine ecosystems (NIPR, 2023). Japan's Arctic involvement is centered around the Arctic Challenge for Sustainability (ArCS II) program, which aims to strengthen domestic research infrastructure and policy coordination in response to Arctic environmental change (ArCS II, 2022). South Korea also maintains a visible institutional presence, with two permanent Antarctic research stations: King Sejong Station (established in 1988) and Jang Bogo Station (opened in 2014), the latter enhancing South Korea's year-round operational capabilities in East Antarctica. These are operated under the Korea Polar Research Institute (KOPRI), which has become a key node in global polar scientific networks (Everett & Halašková, 2022).

In contrast, ASEAN countries remain marginal players in institutional polar research. None currently operate polar research stations or deploy independent scientific missions to the Arctic or Antarctic. However, limited forms of engagement do exist. Malaysia's National Antarctic Research Centre (NARC), affiliated with the University of Malaya, facilitates Malaysian participation in polar research primarily through partnerships with foreign institutions. Similarly, Thailand's involvement is channeled through the Thai Polar Science Consortium, which engages in regional collaborative platforms such as the Asian Forum for Polar Sciences (AFoPS)—a non-governmental organization established in 2004 to coordinate and promote polar science among Asian countries (AFoPS, 2023). These efforts reflect nascent interest but remain small in scale and largely dependent on international collaboration rather than national infrastructure.

Singapore represents a unique case within ASEAN. Though it does not participate in the AFoPS, it holds observer status in the Arctic Council since 2013 and has expressed clear interest in the strategic implications of Arctic climate change, particularly in terms of its potential impact on global maritime trade routes and port infrastructure (Storey, 2016). Singapore's engagement is primarily diplomatic and policy-oriented, supported by institutions such as the Centre for International Law and the Maritime and Port Authority, rather than research-driven. It should be noted, however, that the institutional landscape of polar engagement across the ASEAN Plus Three region remains highly uneven. While China, Japan, and South Korea demonstrate sustained investments in research infrastructure, international participation, and policy development, ASEAN countries—apart from Singapore—lack the institutional capacity or strategic orientation to play meaningful roles in polar governance. The absence of a coordinated ASEAN-led initiative in this domain not only reflects the region's structural constraints but also underscores the limitations of current multilateral frameworks in addressing transregional environmental challenges. Without institutional convergence, the APT grouping remains dependent on national strategies, which in turn hinders the emergence of a unified voice in global polar affairs.

Science Diplomacy and Its Constraints

Science diplomacy represents a promising yet underutilized avenue for ASEAN Plus Three engagement in polar affairs, offering a potentially depoliticized framework for collaboration on pressing climate and environmental challenges. Among the "Plus Three" countries, significant investments have been made in leveraging polar science for diplomatic influence. China, Japan, and South Korea maintain extensive polar research infrastructures, international partnerships, and participation in multilateral scientific networks. For instance, China's Belt and Road Initiative increasingly incorporates polar research cooperation, while Japan's Arctic Challenge for Sustainability (ArCS II) and South Korea's KOPRI-led collaborations exemplify science diplomacy as a strategic tool for international engagement and norm shaping (Everett & Halašková, 2022; Liu & Solski, 2022; Mochinaga, 2020). These countries use polar science not only to advance knowledge but also to secure observer status in Arctic governance institutions, influence regulatory debates, and build bilateral scientific alliances.

In contrast, ASEAN member states—except for Singapore and, to a lesser degree, Malaysia and Thailand—remain marginal players in polar science diplomacy due to structural limitations. Most lack dedicated polar research institutions, sufficient funding, logistical capacity, or trained personnel to participate meaningfully in polar scientific missions. As of 2024, only a handful of ASEAN-affiliated institutions, such as Malaysia's National Antarctic Research Centre and Thailand's Polar Science Consortium, are members of the Asian Forum for Polar Sciences (AFoPS), and their roles are typically secondary within projects led by Northeast Asian or European counterparts (AFoPS, 2023). These contributions are often constrained to observational roles or data analysis rather than full project leadership, reflecting the region's limited scientific autonomy in polar contexts. Foreign funding and logistical support—particularly from China, Japan, or South Korea—remain essential for any sustained ASEAN participation in polar research, raising concerns about long-term dependency and the ability to independently articulate regional interests in polar governance forums.

Moreover, the disconnect between high-level political rhetoric and institutional investment in science undermines ASEAN's ability to transform interest into influence. Declarations issued at ASEAN Plus Three summits regularly express concern over climate change, biodiversity loss, and maritime security, but few of these translate into concrete polar-related research collaborations or joint scientific programs (ASEAN Secretariat, 2021a). While science diplomacy offers a politically neutral path for engagement—potentially mitigating geopolitical tensions and enhancing ASEAN's credibility in global environmental debates—it remains largely aspirational in the absence of internal capacity building. Unless ASEAN governments commit to enhancing domestic research capabilities, investing in scientific training, and coordinating regional participation in polar forums, science diplomacy will remain a symbolic rather than strategic instrument. The current asymmetry between political interest and technical capacity prevents ASEAN from fully utilizing science diplomacy as a means to contribute to or shape the emerging international order in the Arctic and Antarctic regions.

Political Issues as Primary Arena

Polar governance in the 21st century has increasingly shifted from a domain centered on scientific cooperation to one marked by strategic rivalry and geopolitical maneuvering. Both

the Arctic and Antarctic now function as platforms for global power projection, where environmental rhetoric often masks deeper political and economic interests. The Arctic, in particular, has become a space of competitive multilateralism. States such as China, Russia, and the United States leverage scientific collaboration, infrastructure investments, and legal interpretations to extend influence over emerging shipping routes, energy resources, and governance norms (Brady, 2017; Rahbek-Clemmensen, 2017). China's 2018 Arctic Policy notably declared it a "near-Arctic state," a term with no legal foundation under international law but strategically deployed to justify involvement in Arctic affairs (Pincus, 2020). Similarly, in Antarctica, rising interest in bioprospecting, tourism, and fisheries—particularly krill extraction—has begun to stress the Antarctic Treaty System, where decision-making increasingly reflects competing national agendas rather than shared scientific goals (Stephens, 2018).

In this politicized environment, ASEAN's normative approach—emphasizing sustainability, dialogue, and stewardship—has struggled to gain traction. APT declarations on climate and environmental cooperation, such as the ASEAN Plus Three Leaders' Statement on Strengthening Environmental Cooperation for Sustainable Development (2022), remain non-binding and lack enforcement mechanisms. These statements often reflect the consensus-based diplomacy ASEAN is known for, which, while effective in preventing intra-regional conflict, constrains the bloc's capacity to respond decisively to high-stakes global challenges such as polar governance (Katada & Solís, 2008). The principle of non-interference further inhibits ASEAN from developing robust collective positions on external geopolitical matters, including those involving polar affairs.

As a result, ASEAN has been relegated to the role of convener rather than influencer. Its engagement with the polar regions is mostly procedural, limited to observer participation in forums like the Arctic Circle Assembly or indirect involvement through environmental and climate-related statements. The real policy leverage remains in the hands of individual ASEAN states, which often navigate polar diplomacy through bilateral arrangements—particularly with China. For instance, Chinese investments in infrastructure and marine science across Southeast Asia frequently include polar cooperation components, but these are framed within broader strategic initiatives like the Belt and Road or the Digital Silk Road (Gao & Erokhin, 2020). Such dynamics risk reinforcing asymmetries, where ASEAN members accommodate rather than co-shape the political terms of polar engagement.

Without the development of formal policy instruments or a more unified strategy, ASEAN's role in the evolving polar order will remain peripheral. While the APT format provides a multilateral space for dialogue, its institutional design does not support strategic coordination in domains—like the poles—where rapid geopolitical and environmental change demand coherent and timely responses. As polar governance becomes more politicized, ASEAN's current mode of engagement risks irrelevance unless it recalibrates from rhetorical solidarity toward operational alignment with global governance frameworks and strategic polar stakeholders.

Convergence, Dominance, and Prospects

Despite the strategic divergences in national polar policies, there is a discernible convergence in official rhetoric among ASEAN Plus Three countries. Across policy documents, multilateral declarations, and summit communiqués, terms such as "sustainability," "climate resilience," and "environmental stewardship" recur with regularity. The Joint Statement of the

24th ASEAN Plus Three Summit (2021) and the ASEAN Plus Three Leaders' Statement on Strengthening Environmental Cooperation (2022) both underscore shared commitments to combating climate change and protecting ecosystems. This rhetorical alignment reflects a growing regional consensus on the urgency of environmental change, including the far-reaching implications of polar dynamics for food security, sea-level rise, and maritime trade. However, this convergence in language does not equate to policy coherence or balanced participation. Instead, it obscures a deeper asymmetry in capacities and influence.

China increasingly dominates the regional polar landscape, leveraging its expansive scientific infrastructure, strategic planning, and assertive diplomacy. It operates six polar research stations, has launched multiple scientific expeditions, and articulates a comprehensive framework through its Arctic Policy (2018), where it positions itself as a "near-Arctic state" (Brady, 2017; Sharma, 2021). China's Belt and Road Initiative has also extended into the Arctic through the so-called "Polar Silk Road," further embedding polar engagement within its broader geopolitical agenda (Gao & Erokhin, 2020). Japan and South Korea, while scientifically sophisticated and deeply invested in polar research—through institutions such as the National Institute of Polar Research (Japan) and the Korea Polar Research Institute—tend to adopt more technocratic and cautious approaches. They prioritize science diplomacy and environmental cooperation while avoiding overt political contestation with Beijing (Bertram, 2022; Everett & Halašková, 2022). This leaves ASEAN states in a structurally reactive position. Lacking the scientific infrastructure, cohesive strategic vision, and geopolitical weight, most ASEAN members opt for pragmatic diplomacy—participating in polar fora when possible, but deferring to larger regional powers on substantive governance matters.

Looking ahead, ASEAN's potential lies not in competing for dominance but in developing niche capabilities that align with regional needs and global priorities. Technical domains such as climate adaptation strategies for rice-based agricultural systems, marine biodiversity monitoring, or coastal resilience planning offer politically low-risk yet strategically valuable entry points. These initiatives are particularly important given the ASEAN region's acute vulnerability to sea-level rise and extreme weather events—phenomena intimately linked to polar climate change (IPCC, 2023). By investing in collaborative, technically focused projects—potentially in partnership with Japan, South Korea, or EU scientific institutions—ASEAN could begin to institutionalize its role in the broader polar governance landscape without overextending its capacity or straining internal consensus mechanisms. Such projects not only enhance ASEAN's credibility as a constructive actor in global environmental governance, but also build internal resilience and technical expertise that may, over time, enable more strategic engagement in polar diplomacy.

Summary, Conclusion, and Recommendations

The ASEAN Plus Three's engagement with the polar regions remains limited and largely symbolic, shaped more by geopolitical considerations than by coherent environmental strategy. While climate resilience and sustainability are recurring themes in diplomatic discourse, concrete, coordinated actions are rare. ASEAN's consensus-driven framework hampers decisive regional responses, and the most substantive polar activities are conducted by the Plus Three countries—especially China, which exercises outsized influence through its research infrastructure and strategic policies. Given these institutional and political constraints, the most pragmatic path forward lies in focusing on science diplomacy and targeted, low-politics initiatives. Joint research on climate-induced sea-level rise, polar effects

on marine biodiversity, and sustainable coastal adaptation practices can provide ASEAN states with relevant experience and visibility. These focused efforts allow ASEAN Plus Three to contribute meaningfully to polar governance while gradually building technical capacity, reinforcing regional cooperation, and preserving strategic flexibility in a competitive geopolitical landscape.

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Protecting the Rights of Indigenous Peoples in Modern Society: The Goals and Challenges of the Canadian Policy of Reconciliation

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Abstract

This paper presents the historical development and context of the status and treatment of indigenous peoples in Canada from the colonial period to the present and examines the official Canadian government policy of reconciliation which is designed to compensate indigenous peoples for past injustices and to assist them in securing a prosperous and successful future in modern society. The Canadian policy of reconciliation is compared and contrasted with similar official government policies and approaches in other countries. In Canada, the First Nations, Inuit, and Métis represent the three main groups of indigenous peoples which can be further subdivided into dozens of major tribes, cultures, and language groups. Indigenous peoples have been subjected to widespread discrimination and racism in Canadian society since the colonial period and continue to face many significant barriers and challenges in modern society as a result of generations of overt and covert discrimination. Due to centuries of discrimination, indigenous peoples in Canada are more likely to live in poverty, to suffer from substance abuse, to be homeless, and to have low levels of education in comparison with other Canadians. Indigenous children are over-represented in the foster care system, and indigenous adults are over-represented in the prison system. Many indigenous communities continue to suffer from a generational trauma resulting from general forms of discrimination and systematic, institutionalized forms of discrimination in the past. Predictions are made regarding the future of official reconciliation with indigenous peoples in Canada based on historical and current data and emerging trends.

Keywords: indigenous peoples, rights, reconciliation, government policy, Canada

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Introduction

The history of indigenous peoples in Canada has been marked by injustices and discrimination in a wide range of forms since the French and British colonial periods. Indigenous peoples in Canada lost control of vast tracts of land and of many aspects of their unique culture and identity under colonialism (Palmer, 2024). The current national government policy of reconciliation offers financial compensation and a multifaceted approach to improving the lives of Canadian indigenous peoples in modern society. The history of the treatment of Canadian indigenous peoples is similar in many other countries which were formerly European colonies. Centuries of unfair treatment and institutionalized, systematic forms of discrimination have created many challenging social problems for Canadian indigenous peoples which may require generations to solve. The official Canadian policy of reconciliation is an important, major first step in a complex, ongoing process of positive societal transformation for indigenous peoples across Canada.

The Historical Status and Treatment of Indigenous Peoples in Canada

The French were the first to colonize Canada in the sixteenth century and often maintained mutually beneficial relations with indigenous peoples in the early stages of colonization. The First Nations, Inuit, and Métis are the three major groups of indigenous peoples which can be further grouped into dozens of main tribes, unique cultures, and native languages across Canada. Although France claimed ownership of Canada, the number of permanent French settlers was small initially. Indigenous peoples maintained their traditional ways of life, were free to move across a large territory, and assisted the French in the fur trade. Both the French and the British used indigenous tribes in North America as allies in military campaigns and worked closely with indigenous peoples to develop and expand the vitally important fur trade (Comack, 2018). Eventually, the French and then the British began to expand tight control of the land as more towns and farms were established. Colonialism deprived native peoples of freedom of movement over vast areas of traditional territory, and this had a negative impact on traditional cultures and identities closely associated with the land (Palmer, 2024). The concept of private land ownership was alien to Canadian Indians who shared the land and moved freely.

Large scale European settlement of Canada began near the middle of the nineteenth century as priority was given to exploiting more natural resources, and increasingly large tracts of land were taken from indigenous peoples who were required to live on relatively small Indian reserves (Comack, 2018). The loss of most of their traditional land had a devastating impact on the traditional way of life and cultures of indigenous peoples. The steadily increasing number of towns and farms displaced many tribes from their traditional lands, and the growing needs of mining companies for larger tracts of land in the nineteenth century greatly increased the trend of displacement.

The traditional laws, customs, practices, and territories of indigenous peoples were often ignored by colonial authorities who wished to increase control of land for economic development. Colonial rulers and Canadian politicians devised successive legal strategies and policies such as the Indian Act to displace and to control the lives of indigenous peoples (Norman et al., 2023). Property laws and European legal codes were sometimes imposed on indigenous peoples with little or no meaningful consultation. The Indian Act, passed in 1876, combined and organized in a systematic fashion previous colonial laws regarding indigenous peoples in Canada, and this historic act was revised and updated on a regular basis for half a

century (Collis, 2022). Laws were used to control land use and the lives of indigenous peoples who had little power in the colonial system and who often struggled to defend their interests and rights. In exchange for giving up the rights to land in government treaties that were sometimes misleading and poorly understood by indigenous leaders, indigenous peoples received the official promise of financial, agricultural, and educational aid (Comack, 2018). However, official treaties signed with indigenous leaders were often unequal and misleading, and sometimes land was taken without any permission or meaningful compensation. In addition to the negative effects of colonialism, capitalism challenged traditional indigenous beliefs, practices, and social norms by emphasizing private ownership of land and resources, and the rights of individuals and private companies (Palmer, 2024). Many tribes that had been completely self-sufficient before colonialism struggled to find their place in a money-based economy with taxes, private land ownership, and the sale of goods and services which required specific skills, formal education, and special knowledge.

A national system of residential schools run by religious organizations was established near the end of the nineteenth century in Canada, and indigenous children were forced to attend these schools. High rates of poverty, substance abuse, and family breakdowns in Canadian Indian reserve communities may be attributed to the trauma caused by the abusive treatment suffered by generations of indigenous children in the residential school system (Baskatawang, 2023). The residential schools were intended to provide indigenous children with a modern education, but indigenous cultures, traditions, and languages were often suppressed. The long separation from their families and communities was a traumatic experience for many indigenous children. Mental and physical abuse of indigenous children in the system of residential schools in Canada, which separated the children from their families and communities, was widespread (Betke, 2023). The level of abuse of indigenous children in residential schools was sometimes extremely high. Indigenous children placed in the system of religious schools across Canada were often subjected to mental and physical abuse for generations (Comack, 2018). The abuse took many forms. There was often little to no oversight or external review of the actions of white residential school teachers, some children were malnourished, and many children died of contagious diseases (Betke, 2023). The management of residential schools lacked transparency and accountability. Abusive treatment of indigenous children in residential schools was sometimes concealed by some members of the Department of Indian Affairs, church groups, the courts, and members of the media (Betke, 2023). Rather than helping indigenous children smoothly enter the workforce and modern society, the poorly managed residential school system often caused lasting psychological damage to indigenous children who were separated from their own native culture without being able to fully enter modern, mainstream society on an equal footing.

As a result of the negative effects of the residential school system and other forms of overt and covert discrimination in modern society, indigenous peoples often suffer from many social disadvantages. Discrimination and racism rooted in the colonial past continue to adversely affect the lives of many Canadian Indians, placing them at a high risk of homelessness and other social problems (Bingham et al., 2019). The long history of land displacement and of unequal and unfair treaties and agreements continues into the present day in the form of legal disputes with energy and mining companies and corporations over land rights and use. The needs of large corporations for mineral rights and other natural resources has often led to the controversial use or moving of reserves given to indigenous peoples according to various government treaties, and this unfair, unequal treatment may have further impoverished many indigenous communities (Comack, 2018). However, indigenous peoples and their legal representatives have become more skillful and successful

at defending their rights and interests in modern society. Since 2005, different Canadian governments have passed new laws regarding indigenous peoples that affect land rights, the use of natural resources, and taxes (Collis, 2022). Indigenous groups have become more organized and united to gain political support, to obtain compensation for past injustices, and to win major legal cases.

The Challenges Faced by Indigenous Peoples in Modern Canadian Society

Centuries of discrimination and racism have had a negative psychological and economic impact on the lives of indigenous peoples in Canada. A high proportion of indigenous Canadians live in poverty caused by a wide range of social factors and trauma from the colonial past (Comack, 2018). Many indigenous people have become trapped in a cycle of poverty. A lack of employment opportunities, low levels of education, and a cycle of poverty affect many Indian reserves in Canada which also suffer from high rates of suicide and other serious social problems (Grover, 2005). Higher levels of education, social stability, and job skills are needed to break the cycle of poverty.

Indigenous Canadians face many challenges and biases in the justice system. Indigenous peoples are over-represented in Canadian prisons as a result of unfair, unequal treatment, and discrimination in addition to social problems resulting from colonization (Norman et al., 2023). Poverty, homelessness, and family breakdowns may lead to crime, and indigenous Canadians are not always treated fairly in the justice system. The indigenous adult population is over-represented in the Canadian prison system, and the children of indigenous parents are over-represented in the foster care system (Comack, 2018). More social support programs are needed, and the treatment of indigenous Canadians in the foster care system and in the prison system needs to be improved. Indigenous youth are over-represented in the foster care system as a result of family breakdowns and social problems which originate to some extent in unfair treatment since the colonial period and the oppressive system of residential schools (Kakewash, 2024). The legacy of the colonial past continues to negatively affect the lives of indigenous Canadians.

The psychological stress of racism and poverty often leads to substance abuse which causes more social problems. There is an over-representation of Indigenous peoples in the number of homeless in Canada, and many homeless indigenous people suffer from high rates of substance abuse (Bingham et al., 2019). Low levels of education may lead to increased levels of homelessness. Indian and Northern Affairs Canada, a government organization, published a study which concluded that indigenous youth were more likely to drop out of school than other Canadians and noted the over-representation of indigenous youth in the homeless population (Grover, 2005). Education tailored to meet the needs of indigenous Canadians is essential.

Hunger and poverty are significant problems in some Inuit communities. Poverty, lack of access to traditional foods, and climate change have contributed to a growing problem with food security for indigenous communities in the north of Canada (Trott & Mulrennan, 2024). Some members of Inuit groups, who were expert hunters for generations and self-sufficient in food, are now experiencing poverty and malnourishment in modern settlements and in a modern economy. Canadian Indians who do not live on Indian reserves are at a high risk of obesity and other health problems due to high rates of smoking, lack of exercise, and poor diets associated with low incomes (Keshavarz et al., 2023). Indigenous Canadians are sometimes at a high risk of serious health problems due in part to poverty and a lack of

education. Canadian and American Indians may often be victims of racism and discrimination and may suffer from high levels of stress, anxiety, and alcohol abuse as a result (de la Salle et al., 2022). Poverty and discrimination can also lead to negative physical effects and serious health problems. The Truth and Reconciliation Commission (TRC) of Canada concluded in 2015 that the colonial period and residential schools have had a negative impact on the health of indigenous peoples and that Canadian nurses need to be aware of this impact (Bolly et al., 2024). Health care for indigenous peoples needs to be improved.

The Official Canadian Government Policy of Truth and Reconciliation

Significant financial compensation is a key component of reconciliation. In 2006, after a class action lawsuit, the Canadian government paid over five billion dollars to the indigenous victims of the residential school system in accordance with the historic Indian Residential Schools Settlement Agreement (Baskatawang, 2023). This settlement was a major step in the process of reconciliation. The Prime Minister of Canada, Stephen Harper, issued an official apology in an official session of parliament to all the victims of the residential school system in 2008 (Gettler, 2017). The historic, official apology by a Canadian Prime Minister for past injustices and the infamous residential school system was another major event in the ongoing process of reconciliation. Also in 2008, The Canadian government created the Truth and Reconciliation Commission (TRC) to investigate thoroughly the lasting damage caused by the residential school system, which ended completely in 1996 after more than a century of operation, to the culture, collective identity, and unique linguistic heritage of Canadian Indians (Chan et al., 2019). The Truth and Reconciliation Commission was a major, national undertaking by the government. The government demonstrated that it was serious about meaningful and lasting reconciliation. The Truth and Reconciliation Commission of Canada (TRC), which started its work in 2008 and published its findings in six volumes in 2015, used a wide range of research methods and public sources including the testimony of survivors of the residential school system (Gettler, 2017). The TRC focused on the damage caused by the residential school system. The Truth and Reconciliation Commission (TRC), in 2015, made 94 concrete recommendations for change related to government, legal institutions, religious organizations, schools, and other sectors of society to improve the lives of indigenous peoples and to redress past injustices (Chan et al., 2019). Many of the TRC recommendations for change have been implemented.

The findings of the TRC have had a direct influence on the content of history classes in Canadian schools. The colonial period of Canada is being viewed in a more critical fashion, and sensitive issues of racism and cultural destruction are being discussed and examined carefully in schools to create a more informed and tolerant society (Wallace-Casey, 2022). The viewpoints of indigenous peoples were often absent from formal education in the past. The culture of indigenous peoples in Canada has been suppressed in or absent from public education for generations and needs to be included in the curriculum of schools to improve cross-cultural understanding (Chan et al., 2019). Educational institutions help to shape the values of a society. The teaching of history in Canadian school systems has been directly influenced by the findings and specific recommendations of the 2015 Truth and Reconciliation Commission of Canada (Wallace-Casey, 2022). Education can help to end discrimination and racism.

The TRC findings also directly affected Canadian laws. After the publishing of the findings and recommendations of the Truth and Reconciliation Commission in 2015, the Canadian government passed Bill C-15, which requires Canadian laws to be consistent with the United

Nations Declaration on the Rights of Indigenous Peoples (Baskatawang, 2023). Bill C-15 demonstrates the commitment of the Canadian government to human rights. The respect for and promotion of traditional indigenous legal practices may play an important role in lasting reconciliation in Canada (Bell & Friedland, 2019). Laws have become useful tools for protecting the rights of indigenous peoples.

The process of reconciliation and compensation for past injustices is an ongoing process involving many different organizations. The Canadian Human Rights Tribunal ruled in 2016 that major reforms of and investments in the First Nations Child and Family Services Program were necessary (Indigenous Services Canada, 2024). Compensation is sometimes linked to the comprehensive reform and improvement of government institutions and systems, but compensation packages are not always accepted automatically. For example, the Assembly of First Nations, a national organization which represents many indigenous tribes and groups in Canada, rejected a multi-billion dollar agreement that would have significantly reformed the First Nations Child and Family Services Program in October, 2024 (Indigenous Services Canada, 2024). The indigenous groups involved wanted more improvements to be made to the proposed reforms. The First Nations want to significantly reduce the number of indigenous children currently in the foster care system and to explore ways to keep children in their indigenous communities close to their families and native heritage (Indigenous Services Canada, 2024). Indigenous children need to be supported and protected by their own communities and should not be separated from their native culture by force.

National Reconciliation and Indigenous Peoples in Other Countries

Many former British colonies share a similar history. The colonial history of Canada, Australia, and the United States of America is similar and involved the forced removal of indigenous peoples from traditional lands and a systematic policy designed to suppress indigenous cultures, languages, and values in residential schools (Tsosie, 2023). The mistreatment suffered by generations of indigenous peoples in residential school systems in Canada and in other countries has led to a desire for more independence. Indigenous peoples in Canada want more autonomy and self-governance which incorporates, promotes, and respects indigenous culture and traditions (Baskatawang, 2023). Modern borders create additional challenges for forms of self-governance. The modern border between Canada and the United States of America separated and divided many indigenous tribes and groups (Tsosie, 2023). The legacy of the past continues to cause problems for the increased autonomy of indigenous groups in physical, geographical forms.

2008 was a landmark year for official state apologies to indigenous peoples. In 2008, both the Australian Prime Minister and the Canadian Prime Minister issued official government apologies in their respective parliaments to their respective indigenous peoples for residential school systems which tried to forcibly assimilate indigenous children, leading to many cases of abuse (Lightfoot, 2015). The high level, public apologies focused attention on reconciliation in Canada and Australia. Highly publicized, official government apologies do not necessarily translate into more concrete actions and effective efforts to achieve deep and lasting reconciliation with indigenous groups (Tager, 2014). However, the long process of reconciliation in Canada has produced a steady stream of tangible results. In 2009, the American Senate approved the passing of a bill which contained an official apology to American Indians for past injustices, and numerous apologies have been made by the government of New Zealand to Maori groups (Lightfoot, 2015). The official apologies in Canada and Australia influenced domestic politics in other countries with indigenous peoples.

The strength of the apologies in Canada and Australia to indigenous peoples seems greater than that of the apology issued in the United States of America, and this may be explained by years of more active and coordinated actions by indigenous peoples in Canada and Australia to obtain an official apology and more autonomy (Tager, 2014). Indigenous groups in Canada and Australia may be more united and effective in obtaining political support and in using the legal system to protect their rights. Since 2010, official government apologies have also been made to indigenous groups for past injustices in many Latin American countries (Lightfoot, 2015). Gaining political support and influence is a challenge for indigenous peoples. The percentage of the respective populations of Canada, Australia and the United States of America composed of indigenous peoples is small, and the small number of indigenous peoples reduces their political influence (Tager, 2014). Despite the lack of political influence of indigenous peoples, official government policies of reconciliation have become common in many countries.

Implications and Conclusion

Indigenous peoples in Canada and in many other countries with a similar colonial history continue to face a wide range of significant social barriers and challenges. Discrimination and racism still have a major, negative impact on the lives of indigenous peoples in modern society. Indigenous peoples have a desire for more autonomy in decision-making processes that affect their communities and a need to protect and promote their unique traditions and cultural identity (Baskatawang, 2023). Indigenous peoples are proud of their unique, ancient cultures and traditions, and their culture can be a source of great strength. Past government policies, unequal treaties, private ownership of land, laws, corporate needs and priorities, and deeply flawed and poorly managed residential school systems significantly damaged the culture of indigenous peoples. Many of the social problems experienced by indigenous peoples today are rooted in the colonial past and generations of institutional and general discrimination and racism. The official, multifaceted Canadian government policy of reconciliation with indigenous peoples has made significant progress in recent years, but it may take several generations to repair the cumulative damage done by centuries of unfair treatment. Reformed social programs, financial compensation, and education will continue to be essential in transforming the lives of some indigenous Canadians who may be trapped in a complex cycle of intergenerational poverty. Reconciliation with indigenous peoples, involving major compensation packages and institutional reforms, has become a growing trend in countries around the world.

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Sustainable Halal Tourism: Integrating Education and Gastronomy to Promote Cultural Diversity in Malaysia

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Abstract

Malaysia views gastronomy as a powerful agent for understanding cultures and sustainable tourism development. The present study is a critical look at halal tourism in Malaysia and highlights how Maqasid Shariah values are being practiced, particularly through the application of Halal EduGastronomy, which is the integration of education and halal local cuisines. It aims at fostering appreciation for culture while enhancing the ability of the local street food sellers. The general aim of this research is to assess how the application of the concept of Halalan-Toyyiban enhances the halal food experience in tourist destinations in Malaysia. Qualitative case study design was employed, wherein participant observation and in-depth interviewing were utilized. The method provides rich information about strengths and weaknesses of Maqasid Shariah implementation in the halal tourism practice. Findings show that Shariah-compliant practices improve food quality, reinforce ties between tourists and local halal food vendors, and reduce health, safety, and ethical concerns. All these findings combined collectively increase respect for Malaysia's multicultural heritage, which aligns with national tourism goals. Based on these outcomes, the study recommends the Halal EduGastronomy Tourism (HEGTo) model, a Shariah-integrated system that supports cultural preservation and economic sustainability through ethical tourism. By combining education, heritage, and cuisine, this structure offers a strategic direction to upscale Malaysia's position as an excellent Muslim-friendly tourism destination. The study offers significant implications for policymakers, tourism practitioners, and resource persons along with a reference point in setting sustainable halal tourism practices for Malaysia.

Keywords: halal tourism, Maqasid Shariah, education gastronomy, cultural diversity, sustainable tourism

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Introduction

Malaysia is now a global leader in Halal tourism and has led the Global Muslim Travel Index (GMTI) year after year due to the well-established Halal ecosystem. Key agencies such as JAKIM and the Halal Development Corporation (HDC) are key players in certifying and promoting Muslim-compliant tourism products such as Halal-certified food, prayer facilities, and Muslim-friendly accommodations (Saffinee et. al., 2017; Yahya et al., 2025). The integration of Maqasid Shariah, defending religion, life, intellect, lineage, and property, makes tourism moral and inclusive. Malaysia implements these principles through the use of Halal-certified products and secure, family-friendly environments. EduGastronomy promotes cultural learning and empower Halal food business entrepreneurs. This is Malaysia's unique strength in offering experiential and sustainable Halal tourism experience. This study determines the integration of Maqasid Shariah, the objectives of Islamic law, in framing Halal tourism practices that are sustainable in Malaysia. It discovers EduGastronomy (Saffinee et al., 2025), a blend of education and culinary study (Behnke, 2023), as a tool for tourists to learn about Muslim local cultures through food. Locations like Kelantan demonstrate how indigenous foods are able to produce engaging, halal tourism experiences.

Maqasid Shariah-based halal tourism ensures that tourism activities conform to Islamic teachings as well as ethical and sustainable principles. It aims to protect five necessities: religion, life, intellect, lineage, and property. Protection of religion enables tourists to fulfill their religious duties. This includes the provision of halal food, prayer facilities, and Muslim-friendly services. These amenities attract Muslim tourists and promote inclusivity. Protection of life focuses on health, safety, hygiene, and morality, empathizing with the halalan toyyiban concept of clean and wholesome services. Protection of intellect focuses on avoiding harmful drugs like alcohol, protecting mental health and facilitating sound judgment. Lineage protection focuses on respect for family values, as indicated in gender-separate facilities and modest environments. It helps maintain moral and social integrity while on the move. Protection of property involves patronizing ethical enterprise, maintaining local products, and supporting halal-certified entrepreneurship that promotes fair trade and economic growth.

In addition, EduGastronomy merges gastronomy and education, offering travelers a deeper cultural experience using the local halal food. Through cooking classes, food tours, and excursions to local suppliers, tourists are able to explore traditional food while appreciating community identity. It facilitates cultural exchange and provides sustainable income for the locals. However, halal tourism faces challenges such as unclear global halal standards, limited supplier awareness, and limited facilities in non-Muslim nations. In spite of rising Muslim travel demands offer opportunities for economic growth, jobs, and cultural understanding. Destinations can build trust, attract more visitors, and develop socially responsible tourism that benefits all societies by resolving these issues and investing in halal-friendly services. This paper aims to explore how Maqasid Shariah, employed by EduGastronomy, enhances local food vendors and stimulates cultural diversity.

Methodology

This study adopts a qualitative approach (Hollstein, 2011) to explore the role of Halal EduGastronomy Tourism (HEGTo) in promoting sustainable tourism and cultural diversity in Malaysia. A literature review was conducted to identify educational strategies relevant to the Halal tourism sector. In-depth, semi-structured interviews were held with eight local food providers actively engaged in Halal food services across various regions in Malaysia. The

interviews explored key themes such as cultural preservation, education through gastronomy, and the economic impact of Halal tourism. This method was chosen to gain rich, context-specific insights into how traditional dishes and local culinary practices contribute to halal tourism. Informants were selected based on their experience in preparing signature local dishes, as summarized below:

Table 1
Characteristics of Malaysian Informants

Type of Food Premise (FP)	Country	Signature Dish
FP 1	Malaysia	Budu dan ulam-ulaman
FP 2	Malaysia	Nasi Kerabu
FP 3	Malaysia	Nasi Ayam
FP 4	Malaysia	Nasi Ulam
FP 5	Malaysia	Nasi Ayam
FP 6	Malaysia	Laksa Kedah
FP 7	Malaysia	Rendang
FP 8	Malaysia	Masak Lemak

Finding and Discussion

Passing on Traditional Culinary Knowledge

The interviews revealed that Malaysian traditional food knowledge is largely passed down from one generation to the next, in line with the family role in culinary heritage maintenance. FP1 stated learning from parents and friends, whereas FP4 emphasized the royal Malay-Indonesian recipe lineage, echoing food as a carrier of cultural identity. Whereas informal learning was the experience of some providers, others such as FP5 acquired recipes through the process of experiment and cultural sharing, for instance, Chinese cooking methods. Locally, acceptance also became a factor; FP1 indicated that the acceptability by communities affirmed the authenticity of the Kelantanese food. These outcomes are in agreement with the role of Halal EduGastronomy (HEGTo) in transmitting the heritage through food, stories, and lived practice.

Sourcing of Raw Ingredients

Most informants highlighted locality and freshness, opting for Muslim vendors of their trust rather than official Halal certification. FP2 and FP6 highlighted the importance of freshness as a quality and taste determinant, with FP4 elucidating purchases directly from morning markets and Malay villagers. Although formal certification was absent, trust assurance prevailed. However, FP8 pointed toward supply consistency as a problem, suggesting the need for stronger supply chain control in Halal gastronomy due to tourism demands.

Food Premises Hygiene Procedures

Procedures ranged from proper routine to simple daily disinfecting. FP1 employed staff to plan orderly cleaning schedules, while FP5 employed SOPs based on corporate best practices. FP6 did less. These variations offer opportunities for improved hygiene practices. Implementing Japan's digital hygiene systems (Shannon, 2024) would support Malaysian Halal food premises in upholding greater compliance and tourist trust .

Sharing Culinary Knowledge to Achieve Halal EduGastronomy

Malaysian food providers employed varied means of sharing traditional knowledge, including cooking demonstrations, visual aids, and social media. FP1 and FP4 gave demonstrations; FP2 employed infographics to educate customers about Kelantanese culture. Others (e.g., FP8) created content on online platforms like TikTok and Facebook to reach more people. Some providers blended experiential elements like traditional environments (FP5), native clothes (FP4), and outdoor spaces (FP6). These experiential approaches supplement the traditional HEGTo framework, enhancing cultural stories and sustainable involvement in Halal tourism.

Conclusion

This study reaffirms the significance of Halal EduGastronomy Tourism (HEGTo) as a Shariah-compliant framework that synergizes cultural conservation, sustainable tourism, and business viability. Malaysian food operators are actively preserving culinary heritage through cookery classes, storytelling, and themed restaurants (Shahrin et al., 2025), which provide value addition to the tourist experience. Among these strengths, issues of concern are Halal certification procedures, standardization of hygiene, and online presence. In order to be the world leader in Halal tourism, Malaysia must institutionalize HEGTo programs like: Certified traditional cooking classes; Themed Halal food tours and Digital storytelling applications; EduGastronomy tour packages with set itineraries. These projects will not only preserve Malaysia's rich gastronomic heritage but also elevate its global positioning as a world-class Shariah-compliant cultural tourism destination, appealing to Muslim and non-Muslim tourists.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

This manuscript was prepared with the assistance of ChatGPT (OpenAI, GPT-4.5 model). The AI tool was used to support the structuring, language refinement, and proofreading of the text. The authors provided all original content, data, and findings based on primary research. The AI was not used to generate research ideas, collect or analyze data, or draw conclusions. All content was critically reviewed and approved by the authors to ensure academic integrity and accuracy.

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Environmental Education: The Philosophical Value of the Dayak Iban Community to Overcome the Problem of Environmental Damage

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Abstract

Natural resource exploitation and environmental issues have escalated into a global environmental crisis, posing serious threats to the sustainability of human life and development. One indigenous community that actively resists environmental degradation is the Dayak Iban people. This community has long managed its own customary forest, located in the Sungai Utik area of West Kalimantan, Indonesia. In response to environmental destruction, the Dayak Iban community of Sungai Utik has demonstrated remarkable efforts in forest conservation. Their success was internationally recognized when they received the Equator Prize in New York in 2019 for protecting their territory from encroachment and the expansion of extractive industries. In 2023, they were also honored with the 4th Gulbenkian Prize for Humanity in Lisbon, which acknowledged their outstanding commitment to local action and community-based initiatives that support forest preservation and ecosystem restoration. This research is a type of qualitative research that is a literature study. The problems in this study are 1) How do Dayak Iban people view the environment?, 2) How do Dayak Iban people manage the environment?. The results were 1) The Dayak Iban people hold the view that the forest is our father, the land is our mother, and the water is our blood. 2) Dayak Iban people use the slash-and-burn method, the ash from the burning process would be used as fertilizer and mineral resources for the plants, the clusters will decide to shift their land after 5-10 years.

Keywords: Dayak Iban, environment, philosophical value

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Introduction

Today, we are increasingly exposed to news, both locally and globally, about the environmental crisis that poses a serious threat to humanity. Ironically, much of this environmental degradation and the resulting natural disasters such as landslides, floods, air pollution, and forest fires are driven by human activities. This situation reflects a growing apathy among people toward environmental conditions that should be protected and sustained. Naess (1973, as cited in Sukarna, 2021) outlines three fundamental theories regarding human interaction with the natural environment: Anthropocentrism, Biocentrism, and Ecocentrism. These perspectives influence how individuals and societies perceive and treat nature. In Indonesia, extensive environmental damage is caused by human activities, particularly the destruction of tropical forests due to the mining industry a global phenomenon. According to (Maus et al., 2022), 52% of the world's mining areas are concentrated in just six countries: Russia, China, Australia, the United States, Indonesia, and Brazil. Another 21 countries account for 39% of mining areas, while the remaining 118 countries make up only 9% of the total.

Yakin (2017, as cited in Wahyuni & Suranto, 2021) notes that deforestation caused by the mining industry in Indonesia peaked between 2010 and 2014 and continues to this day. Deforestation refers to the decline of forest areas due to land conversion for infrastructure, settlements, agriculture, mining, and plantations. This deforestation is often linked to illegal logging and forest fires, both of which endanger ecosystems and contribute to global warming (Syah, 2017). The conversion of forestland to non-forest land significantly accelerates global warming, primarily through the increased occurrence of forest fires. Global warming has become a critical issue driven by economic activities that neglect environmental consequences, leading to a steady rise in global temperatures in recent years (Prakoso et al., 2019). According to Greenpeace, Indonesia ranks as the third-largest contributor to global carbon emissions, after the United States and China, with around 80% of these emissions resulting from forest burning. In addition to its environmental impact, forest burning poses serious health risks, including prolonged respiratory illnesses (Han et al., 2019).

Natural resources and environmental issues have escalated into a global crisis that significantly affects the sustainability of human life and development. To avert further environmental degradation, it is essential to foster a love for the environment from an early age among future generations. Ecologically, living organisms and abiotic elements are interconnected with one another. Naess (1998, as cited in Ohoiwutun, 2022) stating that the current environmental crisis can be overcome by changing the anthropocentric perspective and behavior of human beings into a more ecological interpretation. The current global environmental crisis can be traced to a fundamental philosophical misunderstanding regarding humanity’s relationship with nature and its role within the broader ecosystem. This distorted perception has led to inappropriate and harmful behaviors toward the environment. Humans often misinterpret nature and mistakenly place themselves above or apart from it, rather than recognizing their integral connection to it. This philosophical misjudgment lies at the root of many environmental disasters we face today. In the field of environmental management, the prevailing anthropocentric worldview that humans are separate from and superior to nature results in the failure to understand that ecological harm ultimately harms humanity itself. Environmental crises are therefore deeply rooted in human behaviors shaped by this anthropocentric philosophy. Such behaviors are characterized by exploitation and destruction, driven by short-term human interests and a disregard for long-term environmental consequences.

Environmental issues, however, are not only scientific or technological problems are also closely tied to cultural practices and local wisdom. Long before the emergence of formal environmental movements, many indigenous communities already possessed systems of local wisdom that contributed significantly to environmental stewardship. Wibowo et al., (2012) highlight the existence of myths, rituals, and wise sayings intimately connected to nature that has historically regulated human interaction with the environment. Local wisdom can be understood as community-rooted knowledge, filled with values of wisdom, virtue, and sustainability, which are upheld and passed down through generations. A compelling example of such environmental philosophy can be found in the Dayak Iban people. The Dayak Iban, one of the largest ethnic groups in Borneo, are found primarily in the northwestern regions of Kalimantan, as well as in parts of Malaysia and Brunei Darussalam (Darmadi, 2017). According to Leo et al., (2021), the Dayak people continue to value forests not only for their ecological benefits such as clean air and water from ecosystem services but also for their cultural and spiritual significance. As forest dwellers, the Iban people rely heavily on forest resources for their livelihoods and well-being. They possess a rich body of traditional ecological knowledge and customary laws related to forest management, which have been preserved and practiced through generations and remain relevant today.

Iban culture is deeply shaped by nature and represents the result of both assimilation and acculturation with various other cultures. Tugang & Kiyai Keai, (2022) explain that Iban culture consists of tangible cultural artifacts and intangible heritage, both of which are strongly linked to the cultural legacy of the Iban people today. Tangible cultural artifacts, which encompass physical items related to cultural practices, often carry specific functions and taboos. These artifacts are passed down from generation to generation, becoming an inseparable part of Iban custom and tradition. Nature serves as both the inspiration and source of materials for the creation of these cultural objects. As a result, many Iban artifacts maintain a strong connection to the natural environment. This cultural continuity, shaped over centuries by the ancestors of the Iban community, plays a vital role in defining the Iban identity.

Methodology

This study employs a literature review as its primary research method. According to (Sugiyono, 2019), a literature review involves theoretical analysis and the examination of references related to values, culture, and norms within the social context under investigation. In this case, the study focuses on collecting and analyzing secondary sources such as books, academic journals, and articles from mass media that pertain to the Dayak Iban community, environmental issues, and philosophical values.

As a type of qualitative research, the literature review does not involve fieldwork or direct interaction with respondents. Instead, the data is derived entirely from librarybased sources. The researchers systematically select relevant literature, read and interpret the contents, and then organize and process the findings to support the research objectives. The goal is to construct a comprehensive understanding of the Dayak Iban's environmental philosophy and cultural values based on existing scholarly and credible literature.

Results and Discussion

Dayak Iban Tribe

The Dayak Iban are one of the largest ethnic groups in Borneo spread across the Northwest region of Kalimantan, including Malaysia and Brunei Darussalam (Darmadi, 2017). Leo et al., (2021) stated that Dayak people still consider the presence of forests essential for their health (clean air and water from the provisioning of ecosystem services), cultural, and spiritual aspects. The Iban people recognized as forest dwellers, rely heavily on the resources provided by the forest. They possess a wealth of traditional knowledge and customary laws related to the management of their ancestral forests and the resources they yield. This traditional knowledge has been transmitted through generations and remains viable today. The indigenous Dayak Iban people in Indonesia already have their own customary forest, precisely in the Sungai Utik Hamlet Area, which is 846 kilometers from Pontianak, the capital of West Kalimantan and still has to travel 75 kilometers towards Lanjak. The customary forest belonging to the Iban community in Sungai Utik Hamlet is the first customary forest area in Kapuas Hulu Regency, West Kalimantan, which received recognition from the Government of Indonesia through Decree Minister of Environment and Forestry No. SK.3238/MENLHK-PSKL/PKTHA/PSL.1/5/2020, issued in May 2020. Government recognition provides rights and claims to communities to use and maintain natural resources in customary forests, which is expected to be carried out in a sustainable manner. The Dayak Iban community, the longhouse of Sungai Utik, had won the Equator Prize organized by the United Nations Development Programme Agency in New York, United States in 2019. They are considered successful in protecting their territory from the threat of encroachment and expansion of extractive investment. In addition, they also received the 4th Gulbenkian Prize for Humanity award from the Calouste Gulbenkian Foundation in Lisbon, Portugal in 2023, along with two other award recipients from Cameroon and Brazil. The award was given in recognition of the extraordinary commitment to local action and community-based movements, which support forest protection and ecosystem restoration.

Figure 1

Documentation of 4th Gulbenkian Prize for Humanity Award

Source: Izzah (2023)

The Iban people practice annual cultivation to grow food crops, particularly rice, glutinous rice, and various vegetables such as potatoes, eggplants, cucumbers, and others. These crops

are cultivated primarily for subsistence and are usually sufficient to meet the needs of each household for an entire year, depending on the harvest. Much of Iban tradition draws inspiration from the forest. This is evident in their handicrafts and traditional arts, where tattoo patterns often reflect forest species such as eggplant flowers, *engkabang* (illipe nuts), and *gerama* (a type of vine). Similarly, Iban textile designs and weaving crafts incorporate natural motifs, further demonstrating the community's deep connection to and dependence on forest ecosystems. Rituals play a central role in Iban cultural and spiritual life, serving as a means of communication with the spirits of ancestors. These rituals are integrated into daily and seasonal activities, such as land clearing for cultivation, planting, harvesting, and other important ceremonies. Nyuak and Dunn (1906, as cited in Leo et al., 2021) explain that rituals can serve multiple purposes: to offer sustenance to nature, to seek permission and protection from ancestors and *Betara* (a term for God in Iban tradition), and to celebrate events such as the harvest festival known as *Gawai Dayak*.

Cultural and spiritual values, along with environmental awareness, are passed down to the younger generation through *traditional schools*. These schools teach children farming techniques, how to identify and sustainably use forest resources, and how to engage with their cultural heritage through singing, dancing, weaving, and ritual practices. Additionally, oral storytelling is used to transmit the history and ancestral knowledge of the Iban community from generation to generation.

Figure 2

Documentation of Dayak Iban Tribe

Source: Verducci (2018)

The Iban people in Sungai Utik have the view that "the forest is our father, the land is our mother, and the water is our blood." The forest is our father, which means the forest is the primary livelihood resource, the land is our mother, which means the ground is where all cultivated plants grow. Water is our blood means that the water resource is essential to support life; there is no life without water (Leo et al., 2022). Therefore, the Dayak Iban community highly upholds the value of loving the environment, one of the ways is to replant various types of useful fruit trees and various types of perennials in former fields. The forest resource management system has proven to be able to contribute to and preserve forest resources, besides that in utilizing the forest as a field area, the equipment used only relies on axes and machetes.

Customary Forest Management

By preserving traditional knowledge, the Iban community of Sungai Utik has successfully sustained its way of life and adapted to the demands of the modern era. The introduction of modern forest management practices can be beneficial, provided they do not conflict with the community's traditional knowledge and customary laws. For example, ecotourism initiatives may involve external stakeholders such as government agencies, which can offer support in the form of training, capacity building, funding, and other resources necessary to implement such programs. However, the local community must remain the primary initiator and decision-maker, as the rightful custodian of their ancestral land.

Integrating traditional and modern forest management approaches has the potential to enhance forest protection, conserve natural resources, and significantly improve the well-being of the Iban people (Leo et al., 2021). In Sungai Utik, the community has classified their customary forest into distinct zones, including production forest (*Damun*), protected forest, sacred forest or cemetery area, old longhouse sites (*Tembawai/Tembawang*), and cultivated land.

The sacred forest and *Tembawai* are considered spiritual spaces where ancestral spirits reside. Cutting down trees in these areas is strictly prohibited, although food gathering and hunting are still permitted within sustainable limits. In the production forest (*Damun*), each family cluster is allowed to cut down a maximum of 15 trees per year, with a replanting obligation of two trees for every one felled. The harvested wood is strictly for personal use such as firewood, tools, or building materials and may not be sold to external parties. Additionally, hunting of protected or sacred wildlife species including hornbills, orangutans, and other specified animals is strictly forbidden. Violations of these customary laws are subject to traditional sanctions and fines, ensuring community compliance and long-term ecological sustainability.

Figure 3

Documentation of Sungai Utik Customary Forest

Source: Leo et al. (2021)

The swidden cultivation system, which has been practiced for centuries, has proven effective in ensuring food security and resilience within the Iban community through a Community Supported Agriculture (CSA) model. The community engages in one main cultivation cycle each year, primarily growing rice, glutinous rice, and various vegetables such as potatoes,

eggplants, and cucumbers. These crops are cultivated solely for subsistence purposes, typically sufficient to meet each household's annual food needs, depending on the harvest outcome. Each family cluster manages between 1 to 3 hectares of land, depending on their capacity to maintain and cultivate it. The land is cleared using a slash-and-burn method, where only a small, designated area is burned. This process is initiated with traditional rituals and is carefully monitored to prevent the fire from spreading beyond the established boundaries. The resulting ash serves as a natural fertilizer and a mineral source for the soil.

Once the nutrient concentration from the ash diminishes and becomes inadequate for continued cultivation, the cluster will shift to a new plot of land. Typically, previously used land is allowed to lie fallow for 5–10 years, enabling natural regeneration through the growth of shrubs and trees. This rotational system helps restore soil fertility over time. The farming season usually begins between August and September, with harvests occurring from February to May, culminating in the Gawai Dayak festival in June to celebrate the harvest through rituals and cultural ceremonies.

Conclusions

The Dayak Iban people embrace a deeply rooted environmental philosophy expressed in their belief that "the forest is our father, the land is our mother, and the water is our blood." This worldview fosters a profound respect for nature and drives sustainable land-use practices. Their commitment to environmental stewardship is reflected in their habit of replanting fruit trees and perennial plants in old cultivation areas to enrich the land for future use. Rice and glutinous rice remain the staple crops of their agricultural system, while other vegetables such as potatoes, eggplants, and cucumbers serve as dietary complements. The quantity of these crops, grown and consumed exclusively within the community, generally sustains each household for an entire year under normal harvest conditions. The slash and burn method, as practiced by the Iban, is not a destructive activity but a regulated, ritual-based form of land management. The ash produced during this process functions as a vital organic fertilizer, supporting healthy crop growth. The rotational cultivation cycle, which includes long fallow periods of 5–10 years, ensures that the land naturally replenishes its nutrients, enabling sustainable agricultural productivity for generations to come.

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Transition to Low Carbon Cities: Lessons Learned and Challenges Being Met for the Case of Thailand

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Abstract

Thailand is facing several sustainability challenges. These include raising the national income, improving livelihood, health, education, and safety; supplying essential infrastructure like power, water, and mobility; and guaranteeing clean air, land, and water. They all compete for scarce financial, human, and intellectual resources, along with a host of others. However, many of these have a direct impact on a city's carbon emissions, and investments in these services may be jeopardized if the causes and consequences of climate change are not addressed. Through lessons learned and obstacles overcome, this article explains Thailand's low-emission development initiatives in order to understand the country's capacity to pursue a low-carbon growth pathway. Governmental systems are becoming more and more integrated with climate change adaptation and mitigation, which is consistent with the growing importance of climate activities on national agendas. In Thailand, interministerial committees have been set up to oversee the development and implementation of climate policies in addition to comprehensive national monitoring, assessment, and reporting mechanisms. Institutional and human capacity limitations persist in all major entities, including those in the public, private, and governmental sectors. Thailand's policy talks have focused mostly on specific concerns like carbon credit trading or afforestation for carbon absorption, with little attention paid to important topics like liberalizing the electric power business and establishing a carbon price. The two possibilities are really a carbon tax system and a cap and trade system, often known as the emission trading system. However, in practice, every technique has advantages and disadvantages.

Keywords: low carbon cities, climate mitigation, climate adaptation, low emission development

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Introduction

All nations are gravely impacted by climate change, which has had an unparalleled global impact. The frequency and intensity of heatwaves have grown, as have heavy precipitation and droughts. Past greenhouse gas (GHG) emissions have also contributed to many other changes in the climate system (Maria et al., 2020). The rate of emissions both now and in the future is anticipated to increase global warming, which will further spur these changes with permanent effects. The Paris Agreement outlines a long-term temperature target and emphasizes the urgency for Parties to achieve a global peak in GHG emissions as soon as possible and then to undertake rapid reductions, on the basis of equity and in the context of sustainable development and poverty eradication, while acknowledging that peaking will take longer for Parties from developing countries (Erickson & Brase, 2019). Many global areas have proposed particular targets for GHG abatement and more stringent environmental laws under this accord (Liobikienė & Butkus, 2017; Sobrinho et al., 2020; Zhou et al., 2021). Nearly 100 nations are discussing achieving net-zero emissions, and more than 30 have made public commitments to do the same, which might serve as an example for other regions looking to more strongly pursue their own climate goals (Wei et al., 2021). Before receiving final Cabinet approval, Thailand's long-term low GHG emission development strategy was created through a collaborative process involving the formation of numerous working groups from all sectors and stakeholders. Thailand's low-emission development strategies (LEDS) outlined specific goals and actions to be taken in order to achieve net zero GHG emissions. Thailand first wants to reach its peak GHG emissions, which will be around 370 $MtCO_2eq$, in 2030. Second, according to projections, Thailand's net emissions of GHG will be around 200 $MtCO_2eq$ in 2050, which is compatible with the global 2-degree trajectory. Third, post-2050 emissions will be in accordance with the IPCC 2-degree pathways, with Thailand aiming to reach the equilibrium between GHG emissions by sources and removals by sinks as early as practicable within the second half of this century (Minister of Natural Resources and Environment, 2021). The energy and transportation sectors are the primary targets of the GHG mitigation strategies listed in Thailand's LEDS. Energy-related measures include increasing energy efficiency, changing technologies, embracing renewable energy sources, and implementing carbon capture and storage (CCS). Modal shift, increased energy efficiency, and the promotion of new, effective vehicle fleets are a few examples of mitigation strategies used in the transportation sector.

By assessing potential for low carbon development in the country, this article investigates the range of options for urban low emission development (LED) plans in Thailand. The essay is organized as follows. The approach used to analyze energy use and carbon emissions trends, assess the viability of low-carbon investment at the urban scale, and determine possible effects is described in the following section. Then, potential low-carbon investment alternatives are taken into account together with the patterns of current energy use and GHG emissions. By emphasizing the spread of low carbon development potential across sectors, we also emphasize the challenge's cross-sectoral nature. Then, we list some of the obstacles to the widespread use of urban LED. The topic of strategies to enhance cooperation across all levels of governance and to mainstream climate considerations into many policymaking realms is supported by this.

Research Method

The article provides a general summary of Thailand's transition to low-carbon cities, including possibilities and obstacles. Present situations are often evaluated through a realist review, which aims to determine what functions for whom, under what circumstances, and in what ways (Pawson, 2005). To start, it is important to understand how energy is used in Thailand.

These are the basic assumptions regarding how a strategy is supposed to operate and what results are anticipated. Then, as we go on, we search for specific evidence to support, refute, or otherwise alter the current blueprints included in Thailand's LEDS assumptions. The conclusions of the review integrate challenges to the widespread use of urban LED with empirical data with a focus on highlighting the connection between the setting in which the strategy is employed, the mechanisms by which it operates, and the results achieved.

Results and Discussion

Overview of Energy Used in Thailand

Due to Thailand's abundant primary energy resources and high final energy production capability, the energy sector has a huge economic impact on the country. Throughout the nation, there are several energy-producing facilities, particularly for coal, crude oil, and natural gas. These components are required for Thailand's power generation, which serves homes with gas and electricity. The market value of all goods and services, including durable objects (such cars, washing machines, and home computers), purchased by households is known as household final consumption expenditure (formerly known as private consumption). Imputed rent for owner-occupied homes is included while home acquisitions are excluded. It also consists of the sums paid as taxes and license and permission fees to the government. Even though they are recorded separately by the nation, household consumption expenditures in this context include the costs incurred by nonprofit organizations that serve households.

At a projected 129 thousand gigawatt-hours (GWh), natural gas ranked third in Thailand's power generation capacity in 2023, after coal and lignite. During that period, Thailand generated over 223 thousand GWh of power. In Thailand, energy resources are abundant. For example, thirteen natural gas producing facilities are located around the country. However, Thailand has had inconsistent natural gas output; in 2023, 26 billion cubic meters are expected to be produced. Coal and crude oil are important resources for Thailand's energy production in addition to natural gas. Crude oil resources can be found throughout the nation, particularly along the coast and in the north and center. After reaching its high in 2016, Thailand's oil production has been gradually decreasing. The same was true for coal; even with its coal resources, the volume of coal produced has been declining yearly. The Thai government has been pushing for increased production of renewable energy, including solar and hydropower, lately. Energy consumption for enterprises accounted for 81,124 ktoe (+4.00% CAGR) of the energy utilized in 2023, a slide decrease of 3.62% from the previous year (84,178 ktoe in 2022), according to Thailand Energy Industry Report from September, 2024 (Italian Trade Agency, 2024). Among the various energy sources, petroleum products accounted for the largest portion of energy consumption (40,386 ktoe). The amount of electricity consumed that was entirely powered by renewable energy sources like solar, wind, hydro, biomass, biogas, MSW, and geothermal power came in second place with 203,875 GWh as shown in Table 1. In addition to natural gas, coal and crude oil are crucial for Thailand's energy output. Sources of crude oil may be found all throughout the nation, however despite the availability of resources, coal production has been decreasing yearly. Hydropower and solar energy are two examples of renewable energy sources that the Thai government is now encouraging to grow.

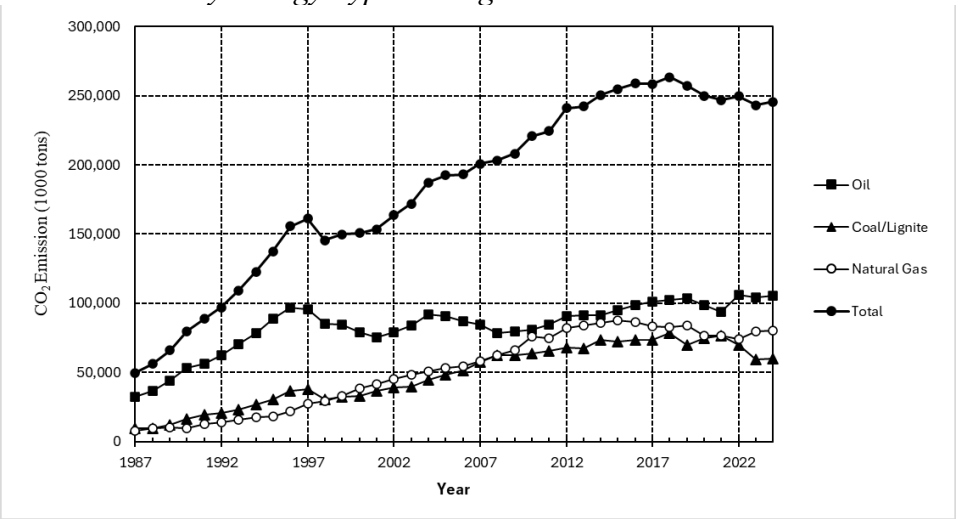
Table 1
Thailand Energy Statistic 2023 (Italian Trade Agency, 2024)

Thailand Energy Statistic 2023	
Final energy consumption	81,124 ktoe (+4.00% CAGR)
Refined oil consumption	40,386 ktoe (+0.63% CAGR)
Electricity consumption	203,875 GWh (+3.38% CAGR)
Petroleum import value per total import	14% (decrease from 15% in 2022)
Energy import value per total import	19% (decrease from 15% in 2022)
Final energy consumption per person	1.2 toe / person
Electricity consumption per person	3,087 kWh / person (+3.45% CAGR)

National GHG Emissions Profile

Thailand has continued to monitor GHG emissions, of which the UNFCCC mandates that the six primary categories (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) be reported. Figure 1 shows global carbon emissions from fossil fuels from 1987 to 2024, Total carbon emissions increased in 1987 to a peak around 2018, before slightly declining till present. Oil emissions have rapid increased until 1997, then stabilizing with modest fluctuations thereafter. Coal/lignite emissions grew steadily from 1987 to peak in the mid-2010s, then declined to about 60,000 units by 2023. Natural gas emissions show the most consistent growth pattern, rising from about 10,000 to approximately 80,000 units over the period. The data illustrates the overall carbon emissions mix has evolved, with natural gas becoming increasingly significant while coal shows a recent decline. Oil has maintained its position as a major contributor throughout the period. As its economy recovered from the Covid-19 pandemic in 2022, Thailand's emissions of carbon dioxide (CO_2) increased slightly from the previous year to about 247.7 million tons (Ministry of Energy, 2024a).

Figure 1
CO2 Emission by Energy Type During 1987 to 2024



The earth warms due to GHG trapping heat. Almost all of the rise in GHG in the atmosphere during the past 150 years can be attributed to human activity. Burning fossil fuels for electricity production, transportation, and industry is Thailand's main human activity-related source of GHG emissions. The largest contributor to CO_2 emissions in 2022—87.91 million tons—came from electricity generation, while the transport industry contributed 79.57 million tons, compared to 13.71 million tons from other sectors. Industry released 66.45 million tons of CO_2

in total as shown in Figure 2. The main source of transportation-related GHG emissions is the burning of fossil fuels in automobiles, trucks, ships, trains, and aircraft. Petroleum-based fuels, mostly gasoline and diesel, account for over 94% of the fuel used in transportation and produce direct emissions. When indirect emissions from the final use of electricity are divided among sectors, the transportation industry is the second-largest source of direct GHG emissions. Although it is an end-use sector for energy, the transportation industry now accounts for a small portion of all electricity use. Electricity-related indirect emissions make up less than 1% of total emissions. The main sources of GHG emissions from industry are the combustion of fossil fuels for energy and specific chemical reactions required to turn raw materials into finished items. The third-largest source of direct emissions is industrial emissions. The industrial end-use sector, which includes the powering of industrial buildings and equipment, is responsible for a far bigger portion of Thailand's GHG emissions than is the case when indirect emissions from electricity use are excluded. When indirect emissions from electricity end-use are taken into account, GHG emissions from the commercial, residential, and industrial sectors rise significantly. This is because a comparatively large portion of electricity is used by buildings for plug-load appliances, lighting, HVAC systems, and air conditioning, as well as for industrial machinery (Ministry of Energy, 2024b).

Figure 2

CO2 Emissions From Several Sectors in 2022

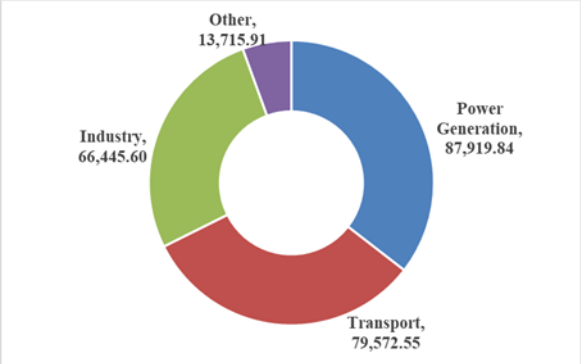
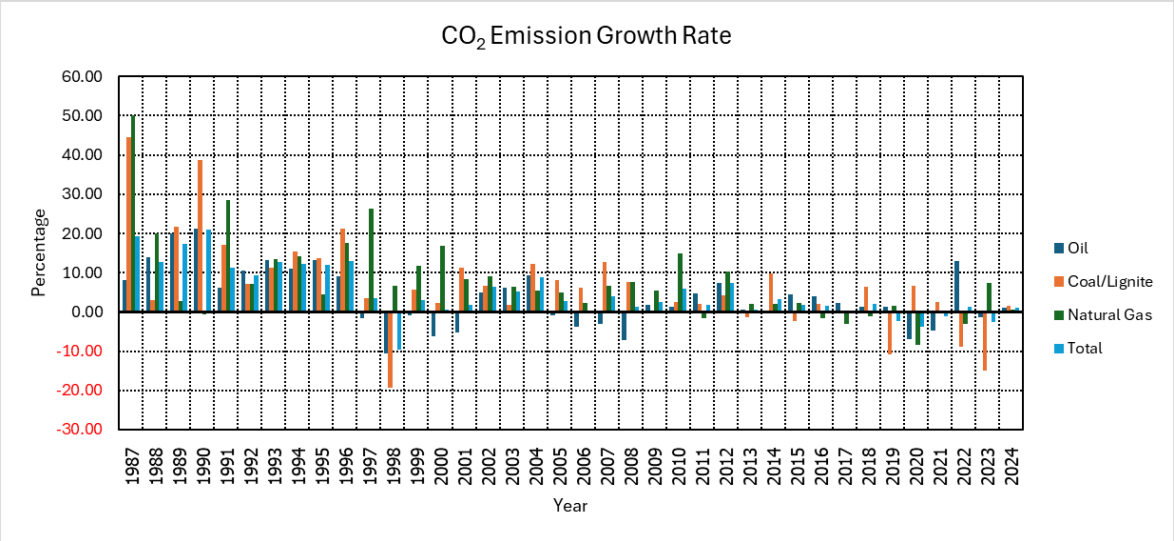


Figure 3 shows the annual percentage growth rate of CO_2 emissions from 1987 to present, broken down by fossil fuel source and total emissions. The highest growth rates occurred in the late 1980s and early 1990s, with some sources showing growth rates of 40-50%. Over time, growth rates have generally decreased, with more modest positive growth in the 2000s and early 2010s, typically below 10%. Recent years (especially after 2015) show a mix of small positive and negative growth rates, indicating periods of both slight increases and decreases in emissions. Coal/lignite emissions show the most volatility, with significant drops in some years. Natural gas generally maintained positive growth rates for longer than other sources, though it shows negative growth in some recent years.

Figure 3
CO2 Emission Growth Rate During 1987 to 2024



Existing Plans Used in Thailand's LEDS Development

Low-emission development strategies, or LEDS, were initially introduced by the United Nations Framework Convention on Climate Change (UNFCCC) in 2008, and there is ongoing discussion about their potential place in a future climate framework. LEDS are usually used to refer to forward-looking national economic development plans or strategies that encompass low-emission and/or climate-resilient economic growth, even though there isn't a clear definition for the term. While LEDS have several uses, their main goal is to support the advancement of national development and climate change policies in a more planned, cogent, and coordinated way. By offering integrated economic development and climate change planning, an LEDS can add value to the numerous existing strategies and studies connected to development and climate change (Clapp et al., 2010). Thai GHG emissions have been reduced by numerous initiatives, the existing blueprints incorporated into Thailand's LEDS are presented in Table 2.

Table 2
National Development and Climate Change Policies

No	National development and climate change policies	Prepared by	Details
1	National Strategy (2018 – 2037)	The Office of the National Economic and Social Development Board, Prime Minister's Office.	The first national 20-year strategy for Thailand has as its goal the country's transformation into "a developed country with security, prosperity and sustainability in accordance with the sufficiency economy philosophy" and the achievement of happiness and well-being for all Thais by the year 2037.
2	Climate Change Master Plan (2015-2050)	The Office of Natural Resources and Environmental Policy and Planning, Ministry of Natural	By 2050, the master plan wants to steer Thailand toward resilient climate change, low carbon growth, and sustainable development. The following are the four main objectives: (i) enhancing climate

No	National development and climate change policies	Prepared by	Details
		Resources and Environment.	resilience by integrating policies and measures across all sectors; (ii) developing mechanisms to reduce GHG emissions, resulting in sustainable low carbon growth; (iii) enhancing stakeholder capacity and awareness; and (iv) developing a database, knowledge, and technology to support climate change adaptation and mitigation.
3	Thailand's NDC Roadmap (2021-2030)	The Office of Natural Resources and Environmental Policy and Planning, Ministry of Natural Resources and Environment.	This roadmap outlines mitigation strategies for the energy, IPPU, and waste sectors. For the energy sector, these strategies include renewable electricity and energy efficiency. For the IPPU sector, these strategies include the replacement of raw materials in cement manufacturing. By 2030, it is anticipated that actions taken under the NDC pathway could cut GHG emissions by 113 $MtCO_2eq$.
4	NDC Action Plan in the energy sector, 2021 – 2030	The Energy Policy and Planning Office, Ministry of Energy.	The Energy Efficiency Plan (EEP2018), the Alternative Energy Development Plan (AEDP2018), and the Power Development Plan (PDP2018) were all integrated into this action plan, which is expected to reduce GHG emissions by 117.66 $MtCO_2eq$ by 2030.
5	NDC Action Plan in the transport sector, 2021 – 2030	The Office of Transport and Traffic Policy and Planning, Ministry of Transport.	This plan outlines strategies for efficient, environmentally friendly, and accessible transportation, and it is anticipated to help reduce GHG emissions by 35.42 $MtCO_2eq$ in 2030.
6	NDC Action Plan in the industrial processes and product use including industrial wastewater sector, 2021 – 2030	The Department of Industrial Works, Ministry of Industry.	This action plan identifies ways to reduce GHG emissions, such as changing the refrigerant and clinker used in industrial production processes, as well as increasing the production of biogas from industrial wastewater by recycling methane gas. The actions outlined in this action plan are anticipated to reduce GHG emissions by 2.25 $MtCO_2eq$ in 2030.
7	NDC Action Plan in municipal waste management sector, 2021 – 2030	The Pollution Control Department, Ministry of Natural Resources and Environment.	This action plan consists of work plans/activities on municipal solid waste management and municipal wastewater management that have the potential to reduce GHG emissions. These measures is expected to contribute to the GHG emission reduction of 2 $MtCO_2eq$ in 2030.

No	National development and climate change policies	Prepared by	Details
8	Energy Efficiency Plan 2018 – 2037 (EEP2018)	Department of Alternative Energy Development and Efficiency, Ministry of Energy.	It aims to lower energy intensity by 30% by 2037 compared to 2010 levels. Energy savings targets of 17,682 ktoe, 21,137 ktoe, 6,418 ktoe, 3,300 ktoe, and 527 ktoe by 2037 have been set for the priority sectors of transportation, industry, commercial/government buildings, residences, and agricultural, respectively.
9	Alternative Energy Development Plan 2018 – 2037 (AEDP2018)	The Department of Alternative Energy Development and Efficiency, Ministry of Energy.	It plans to raise the share of renewable energy generation from 17.29% in 2019 to 30% of the total amount of power needed in 2037, or 29,358 MW.
10	Power Development Plan 2018 – 2037 (PDP2018)	The Energy Policy and Planning Office, Ministry of Energy.	It aims to increase energy security and efficiency in Thailand, concentrating on the following aspects: (1) energy security to meet the country's growing electricity demand while taking fuel diversification into account, (2) economy to maintain competitive power prices over the long term, and (3) environment to cut CO_2 emissions from power generation and emphasize renewable energy sources.
11	Master Plan for Sustainable Transport Development and Climate Change Mitigation and the transport system development	the Office of Transport and Traffic Policy and Planning, Ministry of Transport.	This strategy intends to boost good governance, quality of life, equity, and green growth while also enhancing economic security, competitiveness, and capability. The major topics include (i) integrated transportation systems, (ii) enhanced transportation services, (iii) rules and institutions, (iv) development of human resources, and (v) innovation and technological techniques. Reducing GHG emissions in the transportation industry is predicted to contribute about 36.3% of Thailand's NDC Roadmap in 2030.
12	National Industrial Development Master Plan 2012 – 2031	The Office of Industrial Economics, Ministry of Industry.	By fostering an environmentally responsible approach, this plan highlights global climate change as one of the four fundamental essential elements for national industrial development.
13	Thailand Industrial development strategy 4.0 (2017 – 2036)	The Office of Industrial Economics, Ministry of Industry.	The approach seeks to transform industries into smart ones and lessen industrial waste and carbon emissions.
14	Thailand's Forest Reference Emission Level	the Technical Working Group on	The preparation of this document and its annexes was done in accordance

No	National development and climate change policies	Prepared by	Details
	and Forest Reference Level for REDD+ under the UNFCCC	REDD+ of Thailand, Department of National Parks, Wildlife and Plant Conservation, Ministry of Natural Resources and Environment.	with the procedures and rules outlined in decision 12/CP.17 Section II, the decision's annex, as well as the Intergovernmental Panel on Climate Change's Guidelines for National Greenhouse Gas Inventories. The contribution follows the TACCC[3] guidelines and includes all data and methodologies in a clear, thorough, and precise manner.
15	20-year Forest Strategic Plan (2017-2036)	The Royal Forest Department, Ministry of Natural Resources and Environment.	With the assistance of the local community, this strategic plan seeks to expand forest coverage by up to 40%, particularly in upstream basin and mangrove forests. It would enhance the reduction of GHG from forest-related activities.

Challenges to the Widespread Use of Urban LED

It is obvious that the effort to cut GHG emissions should involve organizations responsible for social and economic development in addition to the environment. The campaign must place equal emphasis on the energy and transportation sectors, particularly with relation to the production of electricity and the burning of fuel in the transportation sector. A significant source of GHG emissions is the use of energy from fuel burning and industrial power use, including at the household level. The foundation for many forms of development, including improving low-carbon manufacturing industries and services, modifying economic structures to be more environmentally friendly, and building sustainable low-carbon cities, among others, is provided by the energy and transportation sectors. To assure low carbon emissions and environmental friendliness in the near future, it is crucial to regulate the structure of the energy and transportation industries. Otherwise, the implementation of the modifications and their long-term effects on the nation's GHG emissions would take a lot of time. The energy and transportation sectors are major sources of emissions because of the methodical reporting and data collection practices. The public should benefit from the long-term plans in reducing GHG emissions by, for instance, fostering stability in the energy sector, enhancing convenience and saving time in travel, and lowering air pollution to promote public health.

It is the duty of the Subcommittee on Climate Change Policy and Planning Integration to make suggestions and recommendations regarding the formulation and integration of climate change policies, strategies, and plans in relation to both mitigation and adaptation; to make recommendations regarding mechanisms and measures, such as statutory provisions and financial safeguards; and to advance a comprehensive system for allocating budgetary resources to address climate change. The working group on national GHG reduction policy and plan integration has integrated pertinent information from the ministerial agencies and academic institutes related to climate change to formulate mid-century low GHG emissions, and this subcommittee considers and offers suggestions on the draft document in the development of Thailand's LEDS.

Opportunities for Transition to Low Carbon Cities and Support Needs

In keeping with the rising prominence of climate activities on national agendas, climate change adaptation and mitigation are becoming increasingly firmly ingrained in governmental systems. Inter-ministerial committees have been established in Thailand to supervise the creation and application of climate policies, as well as extensive national monitoring, evaluation, and reporting systems. All key agencies, including those in the public, commercial, and government sectors, still have deficiencies in their institutional and individual capacities.

To achieve mitigation and adaptation goals and raise ambition, it is crucial to offer assistance and cooperation on climate measures. During the development of the NDC and NAP, a number of difficulties were found, including the unknowns around climate change and its effects. Lack of instruments and methods to enable implementation, lack of data and research on coping mechanisms and vulnerabilities in sectors and the local region, and numerous institutional impediments to cross sectoral and political boundaries. Additionally, the way individuals go about their daily lives is gravely endangered by the global new coronavirus outbreak (COVID-19). Many social and economic activities will change when the so-called "New Normal" follows the epidemic. In order to better restore an ecosystem and economy that supports climate-resilient and sustainable development, particularly through the adoption of NDC, as Thailand plots its recovery from this pandemic, we want to take advantage of this opportunity. The effective and practical implementation of Thailand's NDC depends heavily on the following assistance, including financial, technological development and transfer, and capacity building.

Energy, IPPU, and Transportation:

- In the short-term period, Thailand urgently needs assistance with the transition to renewable energy sources, with a particular emphasis on advanced energy storage systems (EES) and demand-side management strategies, renewable energy technologies (such as solar and wind), the development of electric vehicles (EV), batteries, and infrastructure, and increased grid modernization, smart energy management, and Independent Power Supply (IPS).
- In a mid-term period, Thailand need assistance to increase the potential usage of carbon capture and storage (CCS), carbon capture, utilization, and storage (CCUS), and bioenergy with CCS (BECCS) technologies.
- In a long-term period, assistance is required for Thailand to develop other technologies (such as green hydrogen or bio-hydrogenated diesel) in order to reduce GHG emissions and attain a net-zero economy.

Agriculture and Waste:

- In the short-term period, funding is required for advancing GHG reduction technologies in the agriculture and waste sectors, such as methane reduction in rice farming, wastewater treatment, and waste-to-energy technology.
- In a mid-term period, Thailand requires assistance in developing technology for managing soil and manure as well as reducing and circulating water use.

Policy Implementation:

- Increasing the capacity of the public and commercial sectors to incorporate climate initiatives into their respective plans or companies.
- Increasing public and relevant stakeholder understanding of climate change, Thailand's LT-LEDS, and NDCs.

Instruments and Mechanisms:

- Approaches, processes, financial tools, and incentives to encourage the private sector to make the switch to green investments.
- Exchanging information and best practices on legislative frameworks and procedures to aid Thailand's implementation of the LT-LEDS and NDC.

Policy Recommendations

Thailand clearly has to boost its GHG reduction efforts and meet its present national targets. Given the increasing global pressures to tackle climate change is critical. At the same time, Thailand should use this chance to accelerate the creation of a "green economy" as a new economic growth engine. This will also provide well-paying jobs for Thai workers while reducing health impacts, particularly from air pollutants such as PM 2.5, which frequently accompany GHG emissions. As the speech from Dr. Somkiat Tangkitvanich (2023) who is the president of the Thailand Development Research Institute (TDRI) in the topic "Transforming Thailand into a Low-Carbon Economy and Society", he said the government should examine the following seven policy actions to attain these objectives (Tangkitvanich, 2023):

1. **Transitioning to the Green Economy:** As its principal policy objective, set the transition aim to a "green economy" capable of creating many high-paying "green jobs" for Thai workers. When countries have the capacity to do so, concentrate on underdeveloped sectors (in terms of technology or policy framework coverage); government agencies should also be responsible for developing transformative policy frameworks for those sectors since they can spur corresponding global climate action.
2. **Implementing Carbon Tax:** Reduce and gradually remove fossil fuel subsidies over the next five years, and use the funds to establish a Transition and Adaptation Fund. This money will help to cut GHG emissions and adapt to shifting weather patterns. Long term, the country's excise tax should be converted into a carbon tax.
3. **Creating a Well-Functioning Carbon Credit Market:** Accelerate the creation of a voluntary carbon credit market on both the demand and supply sides. The emphasis should be on lowering verification costs and raising demand for carbon credits in the commercial sector.
4. **Reforming the Electricity Market:** Restructure the country's electrical market, which is currently a bottleneck in the country's transition to a green economy. By liberalizing power generation, enabling third-party access to the grid at a cost-based price, and permitting direct peer-to-peer electricity trading, the new market structure should support the expansion of renewable energy.
5. **Implementing Complementary Measures:** Promote "green products" with various incentives, such as government procurement regulations. Green product standards should be created, as well as expenditures in critical infrastructure, particularly efficient mass transit systems in big cities.
6. **Implementing Large-scale Greenhouse Gas Reduction Initiatives:** Implement "sandbox" projects to reduce GHG emissions on a broad scale. For example, the "Saraburi Sandbox" collaborative initiative in Saraburi province involves corporate sectors, the government, academia, and professional groups, with the goal of creating Thailand's first low-carbon prototype city. The planned "Government Management Modernization Act" should be used to modernize and institutionalize the sandbox effort. The lessons learnt from this sandbox should be applied across the country, and other structural reforms should be implemented.

7. **Mobilising External Fundings to Speed up the Mitigation Efforts:** Create programs to minimize GHG emissions and raise international funds to help Thailand meet its target sooner.

Conclusions

Thailand also lacks a comprehensive plan for lowering GHG emissions. While there are initiatives to reduce emissions in the energy and transportation sectors, there is no overarching plan for the entire economy. Thailand's policy debates are primarily focused on specific topics such as carbon credit trading or afforestation for carbon absorption, while other key measures such as liberalizing the electric power sector and instituting a “carbon tax” have received little attention. In fact, two alternatives are available: a “carbon tax” system and a “cap and trade” system, often known as the ETS. However, in actuality, each strategy has advantages and disadvantages. Emissions trading schemes provide certainty in carbon emission reduction, making it easier for countries to meet their national emission reduction targets and facilitating cross-border carbon trade. A carbon tax, on the other hand, helps firms make investment decisions since they know exactly how much it costs to emit each ton of carbon based on the tax rate. It also allows governments to readily forecast tax income. In practice, adopting a carbon tax is frequently easier since it may use existing tax collection methods, particularly excise tax collection. Meanwhile, implementing an ETS demands the creation of new infrastructure, such as primary and secondary markets for carbon trading with adequate liquidity, which may be challenging to build in developing countries that are just starting to reduce their carbon emissions.

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Mentor Teachers' Expectations and Evaluations of Online Professional Development Courses

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Abstract

The demand for continuous professional development for teachers that is tailored to their needs, accommodates their busy schedules and offers high-quality learning opportunities has encouraged the creation of programmes for online teacher professional development (oTPD). Research shows that learners achieve a similar level of mastery in online courses as in on-site courses. However, learner characteristics, such as digital and self-regulated learning (SRL) skills, appear to play an important role. Despite the proliferation of oTPD courses in recent years, the understanding of best practice regarding the design, implementation, perception and learning outcomes of such courses remains limited. In this context, oTPD courses for mentor teachers were developed, created and evaluated in this project. This paper focuses on expectations and evaluations of these courses held by mentor teachers (N = 183). Feedback was collected via online questionnaires at three measurement points between December 2023 and March 2024. The mentor teachers held high expectations of oTPD. These expectations appear to have been largely met. The mentor teachers expressed satisfaction with the oTPD and reported various personal benefits. However, there are indications that more social interaction would have been necessary to satisfy mentor teachers' expectations and promote professional development even better. Furthermore, mentor teachers' personal characteristics, including age, digital and SRL skills, appear to have influenced their expectations and evaluations. Although exclusively based on self-reports, the results provide important indications of how to enhance the effectiveness of oTPD courses by integrating more opportunities for exchange and scaffolds to support SRL skills.

Keywords: course evaluation, mentor teachers, online teacher professional development (oTPD), quantitative research, theory-practice link

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Introduction

Practical training plays a crucial role in teacher education in Switzerland. It accounts for between 16 and 30 percent of the total study requirements (EDK, 2019). Various professionals are involved in the practical training setting. Mentor teachers—experienced educators—guide and support pre-service teachers during their field experiences and university lecturers take on supervising roles. In working with pre-service teachers, mentor teachers and university lecturers contribute different perspectives to the training, based on different bodies of knowledge and competencies. The integration of diverse knowledge is considered essential for a teacher's professional development (Neuweg, 2015) and can be fostered during training through the influence of these professionals. Accordingly, both mentor teachers and university lecturers must possess a versatile competence profile (Biedermann et al., 2020). One challenge in this context is that lecturers may lack (current) practical experience, while mentor teachers often have limited scientific knowledge (Hüsler et al., 2021).

The project "Online-based Self-learning Courses for Mentor Teachers" focuses on the further development of the competence profile of mentor teachers. The Swiss Conference of Cantonal Ministers of Education (EDK) stipulates that mentor teachers must hold a teaching diploma for the relevant school level, have several years of teaching experience, and complete relevant further training (EDK, 2019)—the so-called "dual competence profile" (Sibold, 2017, p. 109). However, further training for mentor teachers is organized differently across institutions, and there are still no nationwide quality standards (Winkler et al., 2021). At regular schools in Switzerland, teachers are expected to attend further training courses on a regular basis (EDK, 2023). There are no specific requirements for qualified mentor teachers, but as they are also teachers at compulsory schools, the same regulations apply to them. Changes in teachers' employment conditions—like increased part-time work, longer breaks from employment and later retirement—also increase the need for continuing education (Schmidt-Hertha, 2020).

Teachers' engagement in professional development is influenced by the perceived quality of the training offered (Richter & Richter, 2020). However, employment conditions and personal circumstances also play a role in teachers' willingness to participate in continuing education (Schmidt-Hertha, 2020). Surveys on teachers' motivation to pursue continuing education have shown that many teachers are reluctant to attend training due to missed teaching time, difficulty in arranging for substitutes, or long travel distances (Bachmaier, 2011; Richter & Richter, 2020). Designing training programmes tailored to teachers' specific needs is therefore considered beneficial (Richter & Richter, 2020).

The goal of this project is to provide mentor teachers with up-to-date scientific and subject-specific didactic knowledge. In this regard, tandems consisting of university lecturers and mentor teachers co-constructed digital learning resources, so called online Teacher Professional Development (oTPD) courses. The collaboration between university and school professionals aims to ensure high quality and practical relevance, while also facilitating a transfer of knowledge between scientific and practice-oriented experts. The resulting online learning resources enable mentor teachers to engage in continuous professional learning with a high degree of flexibility and autonomy. The oTPD courses can be accessed anytime and anywhere, allowing for learning to be integrated into mentor teachers' complex everyday routines. They are designed to complement, but not replace, existing training programmes. This paper focuses on mentor teachers' expectations and evaluations of these oTPD courses.

Literature Review

Mentor Teachers' Role in Practical Training and Implications for Teacher Professional Development (TPD)

Practical training is a vital component of teacher education, with the quality of mentoring playing a particularly critical role (Bach, 2013; Gröschner et al., 2015). Mentor teachers provide pre-service teachers with firsthand insights into the realities of the teaching profession, helping them bridge the gap between theoretical knowledge and practical application. As such, mentor teachers carry significant responsibilities and substantially influence the preparation of future teachers (Heeralal, 2014). Effective mentor teachers exemplify good teaching practices, are knowledgeable about vocational education principles, and maintain up-to-date expertise. To fulfil these requirements, mentor teachers need up-to-date knowledge and skills, and therefore TPD courses that are compatible with their everyday school life and the supervision of pre-service teachers. Most existing TPD programmes rely on on-site courses, which make it difficult or impossible to reconcile these requirements (cf., Bachmaier, 2011; Richter & Richter, 2020).

Advantages and Disadvantages of oTPD Courses

The COVID-19 pandemic significantly accelerated the transition to digital learning environments and underscored the potential of online education formats. While much of the focus has been on the digitalisation of student learning, teacher professional development has also undergone a profound transformation. Interest in oTPD has grown markedly, driving the development and expansion of digital learning opportunities (Lay et al., 2020). However, despite this rapid growth, there remains a notable lack of high-quality research on the effective design, implementation, and impact of oTPD programmes (Dede et al., 2009; Lay et al., 2020).

Research suggests that learning outcomes in online oTPD formats can be equivalent to those achieved in face-to-face settings (Lay et al., 2020). Moreover, oTPD courses offer several benefits such as increased flexibility, accessibility, and individualization. Participants can access content at their own pace, choose topics relevant to their practice, and engage with resources regardless of location. Despite these benefits, oTPD also presents certain challenges. These include technical issues (Lesiak et al. 2021), reduced opportunities for social interaction, and a higher demand for self-regulated learning (Linde et al., 2023).

Expectations and Learning in the Context of oTPD Courses

Expectations play a critical role in shaping learning engagement, satisfaction, and outcomes in professional development settings, particularly within digital learning environments. In educational psychology, expectancy-value theory (Eccles & Wigfield, 2002) posits that individuals' motivation to engage in a learning activity is influenced by their expectations of success and the value they place on the outcome. For participants this means, if they expect that the course will be flexible, relevant, and easy to use, they may be more likely to invest effort and complete the course. Empirical studies indicate that alignment between expectations and actual learning experiences is a strong predictor of satisfaction and perceived learning outcomes (Martin et al., 2018). When expectations are exceeded—especially in terms of content relevance or usability—participants tend to report increased motivation for future online learning (Alqurashi, 2018).

Conversely, unmet expectations—such as a lack of practical applicability, missing depth, or inadequate interactivity—can lead to dissatisfaction, disengagement and loss of trust in digital formats (Alqurashi, 2018).

It is therefore crucial for the successful completion of an online course that participants know what they are getting into and that their expectations are neither too low nor too high.

Satisfaction and Personal Benefit

Yalçın and Dennen (2024) defined satisfaction in this context as "online learners' perceptions of the extent to which the online learning experience was worthwhile and meaningful in terms of their personal and professional goals" (p. 3815). They showed that self-regulation, self-efficacy, task value, and learning design influence perceived learning and satisfaction and that perceived learning also influences satisfaction.

In the context of this study, this means that for mentor teachers, the perceived relevance of the content to their mentoring responsibilities and the degree of institutional support play a crucial role in shaping engagement and perceived value (Martin et al., 2020; Zimmerman, 2002).

The Role of Learner Characteristics

For mentor teachers engaged in oTPD, it can be assumed that expectations and levels of satisfaction are influenced by a range of individual learner characteristics. Contrary to a common stereotype, age does not appear to play a significant role when it comes to learning outcomes, future use intentions, or satisfaction with digital learning (Fleming et al., 2021; Geiling et al., 2021). The findings on the influence of gender on e-learning outcomes, on attitudes towards e-learning and on self-efficacy in e-learning have so far been inconsistent (Yu & Deng, 2022). The findings are clearer regarding the relevance of prior experience with digital tools, attitudes towards educational technology, and self-regulation skills (Martin et al., 2020; Zimmerman, 2002). Digital skills are considered a prerequisite of effective distance learning as digital literacy has been shown to predict learners' online learning readiness (Yurtseven et al., 2021). Learners with stronger digital literacy and computer skills adapt to online learning environments more easily, they learn more effortlessly in the online setting, and they have a more positive attitude and perception towards distance learning (Drennan et al., 2005; Kayaduman & Battal, 2020; Tang & Chaw, 2016). Self-regulated learners are more capable of setting meaningful goals, monitoring their own learning processes, and maintaining persistence despite challenges—skills that are especially vital in asynchronous online environments (Pintrich, 2000). When participants lack these skills, they may struggle to fully benefit from the flexibility and autonomy that oTPD offers. Therefore, understanding and addressing these individual factors is critical in designing effective and inclusive oTPD programmes.

Objectives

In the previous sections, the needs and significance of oTPD were outlined. In the context of successful oTPD, expectations of the learners and their characteristics seem to play an important role. In order to make the oTPD courses more effective, these features need to be investigated further. To this end, we have explored the following research questions (RQs) to

gain a better understanding of participants' expectations and their evaluation of the oTPD courses they completed:

RQ1: What are mentor teachers' expectations of oTPD courses before and after they have completed a course?

RQ2: How do mentor teachers evaluate oTPD courses?

RQ3: Which personal characteristics correlate with mentor teachers' expectations and evaluation of oTPD courses?

Methodology

Procedure

Thirty oTPD courses were developed by tandems of mentor teachers and university lecturers and made available on the new "LehrBar" platform (https://lehr-bar.ch). Mentor teachers from three Swiss universities of teacher education (Northwestern Switzerland, St.Gallen, Schaffhausen) were invited to participate in the project, explore the courses on offer, and take part in an evaluation survey. They were asked to review the oTPD courses and chose three preferred options, which they were then randomly assigned to. The evaluation survey was conducted between December 2023 and March 2024 and included three measurement points: the first was before starting the course (T1), the second immediately after completing the course (T2), and the third four to six weeks after completing the course (T3). Each survey took approximately 20 minutes to complete, and participation was voluntary. The study was conducted in compliance with ethical standards, with participants providing informed consent before proceeding.

Participants

Two hundred and seven mentor teachers agreed to participate in the study. In total, $N = 183$ mentor teachers completed one of the oTPD courses and filled in all questionnaires. Due to the dropout rate and the fact that participants should be able to choose their preferred oTPD course, mentor teachers were not distributed equally across the 30 courses. The number of participants varied with an average of $M = 6.1$ participants per course ($SD = 2.3$). The mentor teachers predominantly work at kindergarten or primary schools (36.1 %) and secondary schools (63.4 %), with a broad distribution of subjects taught. The sample was diverse in terms of gender, with 63.4 % identifying as female and 36.1 % as male. Participants were between 24 to 63 years old ($Md = 40$ years) and had between 2 and 42 years of teaching experience ($Md = 15$ years).

Survey Instruments

In addition to demographic information (e.g., age, gender, teaching experience), the questionnaires contained established and self-developed scales to assess the constructs of interest. In addition to the mentor teachers' expectations of the courses, the mentor teachers' evaluation of the courses was assessed using the two scales "satisfaction" and "personal benefit". Table 1 provides an overview of the scales used and relevant parameters.

Table 1
Descriptive Statistics of Study Variables

Construct	Reference	Number of Items	T1			T3		
			α	***M***	***SD***	***α***	***M***	***SD***
Expectations	Burghard et al., 2008	7	.73	3.89	0.64	.81	3.93	0.64
Digital Skills	Zahn et al., 2019	6	.81	3.91	0.69	--	--	--
Satisfaction	Own items	4	--	--	--	.88	3.79	0.81
Personal Benefit	Gröschner & Schmitt, 2011	5	--	--	--	.73	3.17	0.67
Self-regulated Learning (SRL)	Chrobak, 2004	10	--	--	--	.77	4.15	0.46

Note. Five-level response format for all scales (1 = *strongly disagree* to 5 = *strongly agree*)

Data Analysis

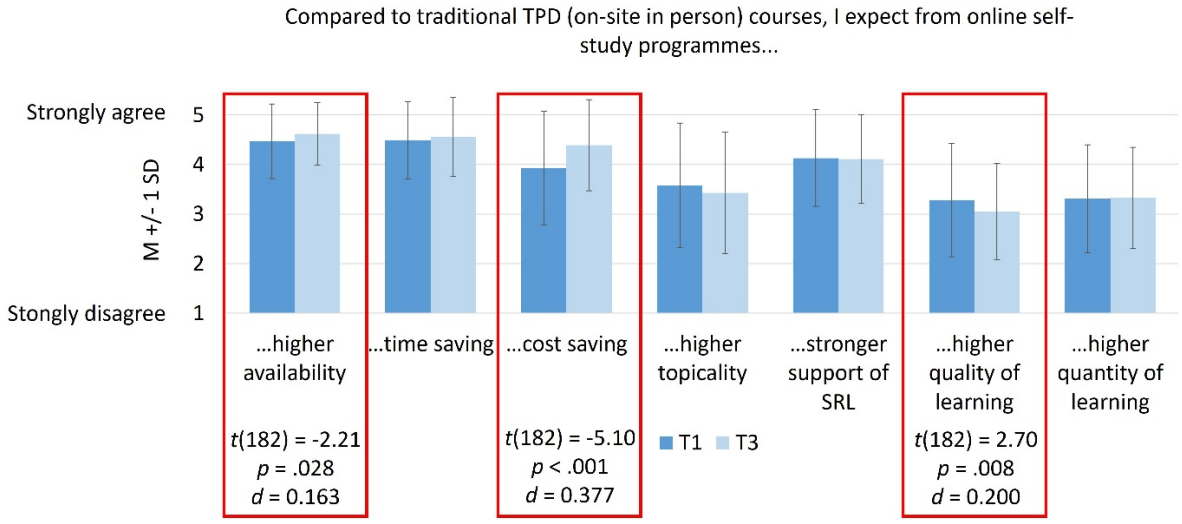
The survey data with closed-response formats were analysed quantitatively using IBM SPSS Statistics Version 29. In addition to descriptive analyses, dependent samples *t*-tests were used to examine changes over time (T1 to T3), and partial correlations were calculated to explore relationships between variables. The correlations were controlled for oTPD because not all mentor teachers completed the same oTPD. The *p*-value of .05 was used as the significance threshold according to the standard convention.

Results

Mentor Teachers' Expectations of the oTPD Courses (RQ1)

Mentor teachers had relatively high expectations at T1 (see Figure 1). The overall expectation score did not change significantly from T1 to T3 (for mean scores and standard deviations see table 1; $t(182) = -.817$, $p(2\text{-tailed}) = .415$). However, the expectation of higher availability and cost saving increased significantly from T1 to T3, whereas the expectation of higher quality of learning decreased significantly from T1 to T3.

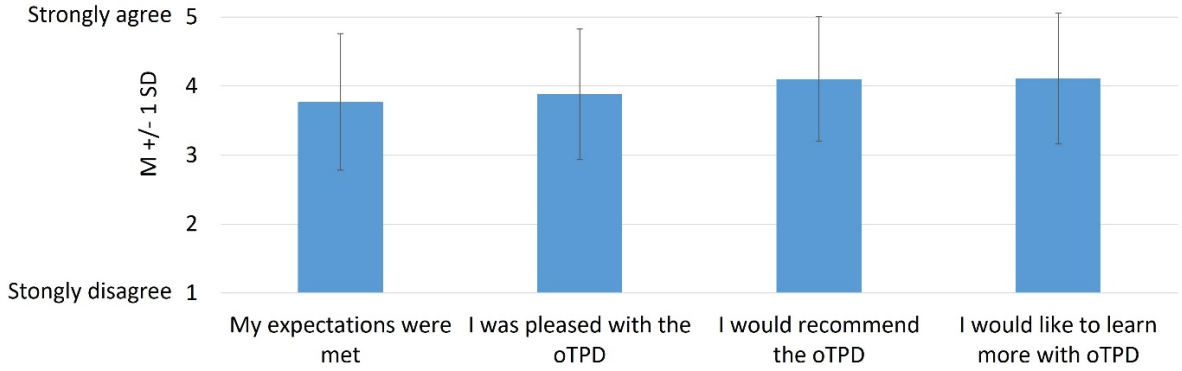
Figure 1
Mentor Teachers' Expectations of the oTPD at T1 and T3



Mentor Teachers' Evaluation of the oTPD Courses (RQ2)

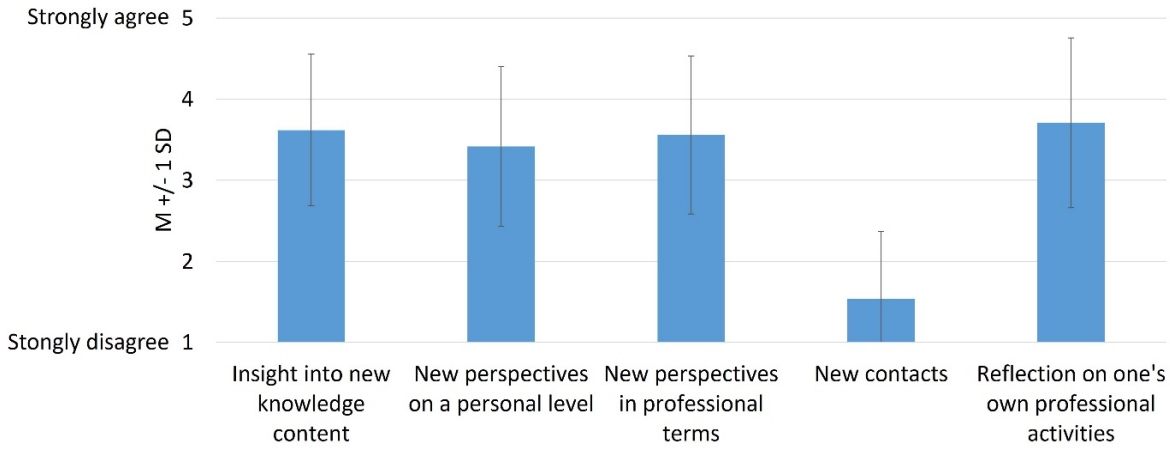
The teachers' assessment of the courses was measured via self-reported satisfaction and personal benefit. The results of the satisfaction scale show that the mentor teachers were mostly satisfied with the oTPD course they completed (see Figure 2). They agreed to all aspects of satisfaction that were assessed.

Figure 2
Mentor Teachers' Satisfaction With the oTPD Courses



Additionally, mentor teachers reported to benefit from the oTPD in different ways (see Figure 3). All aspects of the personal benefit scale were rated moderately positive, except for the aspect of making new contacts, which was rated very low.

Figure 3
Mentor Teachers' Personal Benefit From the oTPD Courses



Mentor Teachers' Personal Characteristics and Their Expectations and Evaluation of the oTPD Courses (RQ3)

When controlling for oTPD course, mentor teachers' gender neither correlates with their expectations nor with their evaluation (satisfaction, personal benefit) of the oTPD course (see table 2). Age, however, correlates negatively with mentor teachers' expectations at T1 and positively with their self-reported personal benefit at T3. Digital skills were found to be positively correlated with expectations at both time points, yet not with the evaluation of the oTPD course. SRL correlates positively with expectations at both time points as well as with satisfaction and personal benefits at T3.

Table 2
Partial Correlations of Evaluation and Expectations With Personal Characteristics (controlled for oTPD)

Personal Characteristic	Expectations of oTPD T1	Expectations of oTPD T3	Satisfaction with oTPD T3	Personal Benefit T3
Gender	-.01	-.02	-.11	.03
Age	-.16*	-.11	-.05	.18*
Digital Skills	.37***	.31***	.01	-.12
SRL	.29***	.33***	.18*	.24**

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

Discussion

This study investigated mentor teachers' expectations (RQ1) and evaluations (RQ2) of oTPD courses, and the influence of personal characteristics on these expectations and evaluations

(RQ3). The findings contribute to a growing body of research aimed at improving the quality and effectiveness of such learning formats.

With a view to RQ1, it was shown that the mentor teachers already had relatively high expectations of oTPD before completing one of the newly developed oTPD courses. Compared to traditional face-to-face courses, they expected greater availability, cost savings and support of SRL above all. In some respects, there were significant changes from before to after course completion. After completing the course, mentor teachers rated their expectations of higher availability and cost savings even more highly than before. The increased expectation of higher availability indicates that the course fulfilled the need for flexibility, a factor that has been shown in other studies to be central to TPD (e.g., Lay et al., 2020; Richter & Richter, 2020). However, expectations that an oTPD course would lead to higher-quality learning than a traditional course were lower after completion than before. This may be because no questions (e.g., clarification questions) can be asked while working on the oTPD course, and discussion of the content is very limited in the online setting. Only a few courses on offer provide an online forum for written exchange. Although an optional exchange between participants and course developers via video call was offered for each course, this was only used by a very small number of mentor teachers. Traditional in-person training often facilitates spontaneous exchanges, collegial dialogue, and peer learning, which are difficult to replicate in fully asynchronous online formats. This would, however, be crucial for sustained professional development and reflective practice (Darling-Hammond et al., 2017).

Regarding RQ2, mentor teachers evaluated the oTPD courses mostly moderately positively. They reported to be moderately satisfied and to perceive various personal benefits. Regarding satisfaction, the mentor teachers (tended to) agree that their expectations had been met, that they were pleased with the oTPD course and would recommend it to others, and that they would like to learn more with oTPD courses in future. In terms of personal benefits, the mentor teachers stated that they had acquired new knowledge, learnt new personal and professional perspectives and were encouraged to reflect on their own professional actions. The only aspect they rather disagreed with was making new contacts. This is not surprising in an online setting, given that there was no opportunity for personal contact with others when completing the course. Only a single optional subsequent online exchange via video call was offered, but this was hardly used. As previously mentioned, collaboration and community-building would, however, be important for sustainable TPD (Darling-Hammond et al., 2017).

With respect to RQ3, correlations between the personal characteristics of gender, age, digital skills and SRL skills on the one hand and the mentor teachers' expectations and evaluations of the oTPD courses on the other hand were investigated. It was found that there is no correlation between the gender of the mentor teachers and their expectations or their assessments of the courses. This was also not entirely unexpected, given the inconsistent findings in this regard from previous studies (Yu & Deng, 2022). Regarding age, the older the mentor teachers were, the lower were their expectations before completing the course, but the higher was their perceived personal benefit afterwards. The correlations with age therefore appear to be complex. This is possibly a reason why no correlation between age and different aspects of e-learning was found in other studies (Fleming et al., 2021; Geiling et al., 2021). Self-assessed digital skills correlated positively with mentor teachers’ expectations before and after course completion. SRL skills were also found to correlate with expectations, perceived personal benefits and the satisfaction with the course before and after completion. These findings indicate the importance of personal characteristics for the expectations and

evaluations of oTPD courses. In particular, SRL skills appear to play a significant role. Online education appears to demand greater self-motivation and self-discipline, since no instructor ensures that the tasks are completed. Flexibility in terms of time also requires participants to take responsibility for their learning and plan it consciously. This highlights the importance of designing online learning environments that support autonomous learning and provide scaffolding for participants with different levels of SRL skills. Digital skills seem to still play a role regarding expectations of oTPD, too, but not in terms of satisfaction and personal benefit. Therefore, SRL appears to be a more critical determinant of oTPD success, which is consistent with the findings of previous studies on online adult learning (Alqurashi, 2018; Martin et al., 2018).

Limitations of the study must be taken into account when interpreting the results. This includes the possibility of limited generalisability. The sample consisted of mentor teachers affiliated with specific institutions in Switzerland, and while diverse in age, experience, and teaching levels, the findings may not fully reflect the experiences of educators in other regions or educational contexts. It also should be mentioned that the mentor teachers took part in the study on a voluntary basis and received a small expense allowance. Moreover, the courses were evaluated shortly after completion, whereby only self-reporting instruments were used; further research should examine the long-term impact of oTPD on classroom practices, mentoring quality, and pre-service teacher outcomes using various data sources, including objective data.

Conclusion

Overall, the high levels of satisfaction reported by participating mentor teachers, alongside predominantly positive perceptions of the personal benefits, support the conclusion that oTPD formats can meaningfully complement traditional in-person training. This appears to be particularly true when the oTPD is designed with emphasis on flexibility, relevance, and learner autonomy.

However, while flexibility and autonomy appear to be a major strength of oTPD, it may result in diminished collaboration and community-building, which are essential for sustained professional development (Darling-Hammond et al., 2017). Consequently, it is important to pay more attention to social-motivational aspects of learning when developing oTPD courses in future. A single subsequent optional video call does not appear to address the need of mentor teachers for dialogue and discussion. Providing more discussion forums and peer feedback opportunities, or offering more optional live sessions, could enhance the social dimension of learning and provide channels for reflection and exchange. Creating hybrid models that combine online, self-paced modules with in-person or synchronous components could strike a better balance between flexibility and interaction.

Another consequence results from the significant role of SRL in learning in oTPD courses. Support mechanisms for self-regulation, such as goal-setting prompts or progress trackers, could therefore help participants to manage their learning more effectively.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work the authors used *DeepL Translator* and *DeepL Write* in order to improve the language of the manuscript. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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From Symbol to Affect: A Study of Post-textual Reading in Digital Interfaces: A Case Study of Multi-sensory Practice in "Try, Fail and Overcome" Workshop

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Abstract

In an era of explosive digital image growth, text as an information carrier undergoes continuous restructuring, transforming both creative forms and reading habits. This research examines the evolution of post-textual practice in digital environments through the lens of semiotics and affective theory, focusing on how digital interfaces reshape reading experiences and (syn)aesthetic perception, and investigating how textual meaning is constructed within multi-sensory spaces. Through an intensive interdisciplinary workshop titled "Try, Fail and Overcome" at Shih Chien University in 2021, involving 28 participants from different academic levels, we documented both the seven-day creative process and subsequent viewer interactions through systematic photographic observation. Our analysis revealed three key dimensions: the formation of emotional responses, the construction of spatial narratives, and the transformation of creative experiences, while also capturing how viewers engaged with works through bodily exploration and environmental resonance. Our findings indicate a theoretical shift from symbolic interpretation to affective connection, redefining the relationship between creators, texts, and viewers through the examination of post-textual practice, reading behavior, and (syn)aesthetic perception. The transformation of reading experiences in digital environments not only challenges traditional textual concepts but also highlights the crucial role of affective connection and (syn)aesthetic perception in constructing new forms of reading experience. This research provides a systematic theoretical foundation for post-textual practice while demonstrating its developmental potential in digital humanities.

Keywords: post-textual practice, affective experience, reading reconstruction, (syn)aesthesia, digital humanities

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Introduction

From the invention of movable type printing to the evolution of the new media era, the proliferation of digital screens has not only challenged the dominance of printed text but has also catalyzed transformations in reading behaviors: transitioning from linear textual media to multimodal visual media, from narrative completeness to fragmented expression, and from unidirectional information transmission to interactive experiential construction. Through empirical research, it has been established that digital environments have reshaped readers' perceptual modes, including the integrated utilization of visual, auditory, and tactile modalities, thereby influencing the processes of cognitive processing and emotional projection. This transformation in perceptual modes manifests not merely at the level of information reception, but profoundly affects readers' understanding and interpretive approaches to texts, facilitating a shift in reading behaviors from passive reception to active construction. However, while contemporary research emphasizes innovative applications of technological interfaces, there remains limited exploration of how digital environments reconstruct the perceptual dimensions of texts, particularly regarding the deep interactive mechanisms of cross-sensory integration and emotional resonance, which warrant systematic empirical investigation. Within this context, examining the reshaping of reading experiences by digital environments involves not only technological innovation but necessitates a profound understanding of the complex interactive relationships among perception, cognition, and emotion.

Reading, as a process of meaning construction, is established upon the foundations of knowledge accumulation, experiential accumulation, linguistic systems, and community contexts, realized through complex symbolic decoding. Following the rise of the Internet in the 1990s (Campbell-Kelly & Garcia-Swartz, 2013) and the emergence of touch-screen smartphones in 2007 (West & Mace, 2010), the definition of text has expanded from “text-based static carriers” to “interactive systems integrating multimedia elements.” This transformation marks the advent of the “post-textual era”—while preserving the core symbolic transmission function of text, it emphasizes the multiple characteristics of reader subjectivity, interactivity, and immediacy. This transformation is manifested not only in carrier forms but reflects fundamental changes in contemporary society's approaches to knowledge acquisition and information processing. Driven by digital technology, reading is no longer confined to single-dimensional textual decoding but has evolved into comprehensive experiences encompassing multiple sensory modalities including visual, auditory, and tactile elements (Rose, 2006). Consequently, the relationship between traditional literacy and reading behaviors requires reconstruction within the framework of digital media characteristics to adapt to this pluralistic and dynamic reading environment. This transformation also compels us to reconsider: how do we define and evaluate the essence of reading and its sociocultural implications in the digital age?

This research focuses on post-textual practice in digital environments, examining how visual symbols transition from traditional diachronic linear narrative structures (where readers decode texts following predetermined sequences) to synchronic multiple perceptual constructions (where readers autonomously connect multiple textual elements within the same spatiotemporal framework). Within this fundamental transformation, creators evolve from singular content producers to interactive designers; textual carriers transcend the limitations of static planes, developing not only programmatic and interactive digital interfaces but expanding into three-dimensional spatial domains where viewers can “enter,” “traverse,” and “dwell,” constituting entirely new dimensions of bodily perception; viewers

transform from passive recipients to active participants and co-creators, constructing meaning through bodily interaction with environments within spatialized reading processes. Through systematic analysis of emotional experiences shaped by visual elements, spatial perception, and bodily participation, this research endeavors to reveal how contemporary texts transcend traditional semiotic unidirectional interpretive frameworks to develop dynamic meaning production mechanisms among multiple subjects. This exploration not only deepens our understanding of textual evolution in the digital age but provides new theoretical perspectives for contemporary cultural studies.

Theoretical Framework - From Semiotics to Affective Experience

When exploring reading experiences in the post-textual era, the combination of semiotics and affective theory provides a unique analytical perspective. Semiotic concepts can be traced back to the theoretical constructions of Charles Sanders Peirce and Ferdinand de Saussure from the late 19th to early 20th centuries, who viewed signs as fundamental units of meaning production, establishing systematic analytical methods (Barthes, 2016). With Roland Barthes' introduction of semiotic mythology in the 1960s, semiotic research extended to the analysis of cultural phenomena (Barthes, 2016). Affective theory originates from Baruch Spinoza's philosophical contemplation of affect, developed through Gilles Deleuze's reinterpretation in the 1980s into a research approach focusing on interactions among body, perception, and environment. Massumi Brian further applied affective theory to digital culture studies, emphasizing how technological interfaces reshape human perceptual experiences (Wang, 2022). The convergence of these two theories in the digital age enables us to simultaneously attend to both structural meaning and non-structural experiences of texts: semiotics provides tools for analyzing digital symbol operations, while affective theory supplements dimensions of bodily perception and emotional generation, thereby comprehensively grasping transformational characteristics of reading behaviors in the digital age.

Reconstruction From Semiotic Perspectives

As the foundational structure of human communication, symbolic systems undergo fundamental transformation in the digital age. Traditional semiotics established frameworks for symbolic interpretation through distinctions between surface structure and deep structure: surface levels focus on immediate communicative messages, while deep levels involve cultural contextual interpretation. Saussure's theory of signifier and signified established analytical foundations for symbolic operations (Barthes, 2016). However, when symbolic systems enter digital environments, this interpretive mode based on binary oppositions proves insufficient. In the post-textual era, symbolic operations exhibit multi-layered, interactive, and immediate characteristics: first, digital interfaces alter the material basis of symbols, enabling them to simultaneously possess visual, auditory, and tactile dimensions; second, symbols transform into dynamic entities capable of real-time interaction with readers, breaking traditional unidirectional transmission modes; finally, symbolic meaning production involves complex interactions among technological mediation, user experience, and environmental contexts, forming intricate meaning networks. This new form of symbolic operation not only challenges traditional semiotic analytical frameworks but inspires us to consider: within contexts of continuous digital technological evolution, how can semiotic theory respond and develop more appropriate interpretive modes? This transformation requires us to reconsider applications of semiotic theory in the digital age.

Theoretical Construction of Affective Experience

Affective theory provides fresh perspectives for understanding digital interactive experiences. Traditional emotional research emphasizes analysis of personal subjective feelings, while affective theory emphasizes interactive relationships among body, environment, and technology (Chiu, 2020). In digital environments, affective experiences present multi-layered transformations: first, immediacy of bodily perception—users directly participate in textual meaning production through touch, gesture, and other bodily interventions, forming new perceptual modes; second, real-time environmental influence—unlike traditional exhibition spaces' white cube thinking, contemporary fields reflect more complex environmental factors. Flowing light and shadow changes, multi-layered sound overlays, and traces left by space users all become extensions of textual meaning. These environmental elements directly influence perceptual states and cognitive processes, creating multi-sensory experiences; third, synchronicity of collective experience—open space design enables sounds, crowd movements, and interactive feedback from different areas to blend, forming dynamic emotional fields that promote perceptual resonance and meaning co-construction among groups. This particularity of affective experience compels us to transcend traditional linear modes and reconsider bodily participation, spatial perception, and group interaction in digital environments, thereby establishing more complete theoretical frameworks.

Multiple Dimensions and Historical Continuity of Textual Interpretation

Throughout historical continuity, textual interpretation has always reflected temporal thought patterns and social structures. Taking the second century CE as an example, political stability and peace enabled all ethnic groups within the empire to cohere through common language and culture, with “universal education” ideals highly valued, aiming to cultivate complete individuals versed in all disciplines. This historical experience of pursuing complete knowledge systems provides important reference for understanding contemporary transformations in textual interpretation. Texts evolved from initial singular exploration of authorial intent to multi-dimensional interactions encompassing authorial intent, interpreter intent, and textual intent, embodying continuous expansion of interpretive possibilities (Gadamer, 1989). Rational thinking modes continue to dominate textual evolutionary trajectories. From logical reasoning and scientific methods to computer programming language development, all demonstrate normative constraints. However, catalyzed by digital environments, texts have shifted from “identity” toward “contradiction,” ultimately trending toward possibilities of “infinite transformation.” This transformation manifests not only formally but profoundly influences meaning production mechanisms: while traditional symbolic systems are established on social contract foundations, digital age texts have transcended such predetermined orders, continuously transforming and enriching existing boundaries. The multi-ethnic, multi-linguistic convergence experience of the second century CE confirms that cultural differences do not necessarily lead to comprehension barriers. Similarly, while contemporary society faces more complex convergences of ethnicities, languages, and concepts, the “identity” of meaning itself undergoes fundamental transformation (Gadamer, 1989). Within this field of continuously flowing meaning, two interpretive attitudes of “text as world” and “world as text” interweave: the former focuses on how texts reflect and construct reality, while the latter explores how texts form autonomous meaning systems. This dynamic balance transforms texts from simple knowledge transmission media into open fields continuously producing new meanings.

Repositioning Theoretical Foundations

Contemporary visual culture studies must respond to dialectical relationships among symbolic operations, perceptual experiences, and consciousness formation in the digital age (Rose, 2006). Through examining developments from structuralist semiotics to post-structuralist affective theory, this research explores three core dimensions: in digital environments, texts transform from fixed media to dynamic fields, requiring repositioning of signifier-signified relationships; interactions between visual elements and emotional resonance become characteristics of post-textual practice—symbols are no longer limited to representational functions but develop as mediators triggering multiple perceptions; when experiences transcend limitations of singular perception to form multi-layered perceptual systems, they not only expand meaning production pathways but redefine interactive relationships between texts and subjects. This theoretical repositioning manifests primarily in the following dimensions: first, semiotic theory needs to expand its analytical frameworks to accommodate fluidity and diversity of symbolic operations in digital environments, particularly when processing non-linear meaning production processes. In knowledge transmission processes, every word contains implications and metaphors, expressing meanings beyond literal interpretation and containing information that cannot be revealed independently (Barthes, 2016). To understand these complex symbolic systems, we must transcend existing human civilization perspectives and seek deeper revelations. Second, introduction of affective theory provides new perspectives for understanding contemporary textual practice, particularly valuable in explaining multiple dimensions of perceptual experience; finally, application of empathy theory helps us grasp meaning generation processes under multi-sensory interactions, thereby establishing more complete analytical frameworks. Based on this foundation, this research proposes: theoretical construction of contemporary visual culture should seek dynamic integration between systematic analysis of semiotics and perceptual dimensions of affective theory. This integration must not only describe complexity of textual operations in digital environments but explain multiple roles of perceptual subjects in meaning construction processes. Through such theoretical reconstruction, we can more accurately grasp evolutionary characteristics of contemporary visual culture and deeply understand its fundamental impact on human cognitive modes. Simultaneously, this theoretical framework provides broader exploratory space for subsequent research, enabling us to develop richer research methodologies on existing foundations.

New Dimensions of Cross-Cultural Reading - Symbolic Practice Transformation in Contemporary Art

Contemporary artistic practice not only continues the exploratory trajectory of early digital art but demonstrates multiple evolutionary directions in symbolic operations: from static symbolic systems toward dynamic interactions, from unidirectional reading modes developing into multi-sensory perceptual experiences, and from single media expanding to cross-domain practices. These transformations manifest in creators' reinterpretation of symbols, emphasis on bodily participation, and breakthrough of medium boundaries. Through systematic classification and analysis, we can observe how contemporary artists inherit the experimental spirit of early digital art while pioneering richer forms of expression.

Symbolic Reconstruction and Meaning Transformation

Figure 1
Craig Ward, Subvisual Subway, 2015

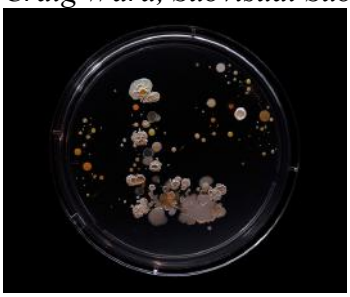


Figure 2
Marvin Kim, Type Plant, 2017

Figure 3
Youdhisthir Maharjan, A Book of Silence, 2024

In contemporary art and design practice, textual symbol reconstruction presents multiple processes of decoding and re-encoding. From British artist Craig Ward's *Subvisual Subway* (2015), which abstractly reconstructs subway station names (Figure 1), Korean designer Marvin Kim's *Type Plant* (Maher, 2019), exploring organic evolution of plant growth (Figure 2), to Nepalese artist Youdhisthir Maharjan's *A Book of Silence* (2024) investigating dialectical relationships between text and space (Figure 3), these works embody redefinition of signifier-signified relationships in semiotics.

Ward transforms everyday textual linear reading by converting traffic indicators into pure visual codes; Kim transforms static typefaces into temporally dimensional visual symbols through plant life rhythms; while Maharjan constructs new visual languages in positive-negative spatial relationships through hollowing book pages and perforating texts.

In the transformation process, works display multi-layered changes from language to image. Typography design is no longer constrained by traditional rules but creates visual tension between abstract and figurative through re-encoding. Ward employs typography to deconstruct symbols into pure visual elements; Kim infuses organic growth qualities into

design, granting typefaces concepts of life cycles; Maharjan explores spatial meanings generated by symbolic absence through material dissolution of texts. These strategies not only expand expressive possibilities but deepen dynamic relationships between signifiers and signifieds—here, textual symbols are no longer merely conceptual carriers but become visual organisms capable of self-generation and continuous mutation.

From contemporary art contexts, practices involving English, Korean, and positive-negative spatial techniques demonstrate transformation trajectories of symbolic systems in "post-textual" practice. When texts undergo de-symbolization and spatial reconstruction processes, original linguistic frameworks dissolve, creating cross-media visual dialogue fields. These works prove that creators can establish new visual languages through textual reconstruction. Such transformation not only embodies cross-cultural practice but reveals dialectical relationships between text and space: after symbols lose original linguistic functions, they continue exploring transformational possibilities from planar symbols to spatial dimensions through experimental reorganization and deconstruction.

Bodily Participation and Spatial Experience

In contemporary art exhibition contexts, space becomes a crucial field for reconstructing textual meaning. Taiwanese artist John Yuyi's *Temporary Tattoo* series (2016–) transfers social media symbols onto skin (Figure 4), American creator Laurie Frick's *Imagined Time* (2019) constructs spatial dimensions of time through data (Figure 5), and Italian artist Rosa Barba's *Composition in Field* (2022) explores symbolic interactions within fields, demonstrating how spatial intervention changes textual forms of existence (Figure 6). Yuyi uses the body as a carrier medium, granting virtual symbols materiality; Frick transforms abstract temporal data into perceptible structures; while Barba creates dynamic relationships between symbols and viewers through field characteristics.

Figure 4
John Yuyi, Temporary Tattoo, 2016

Figure 5
Laurie Frick, Imagined Time, 2019

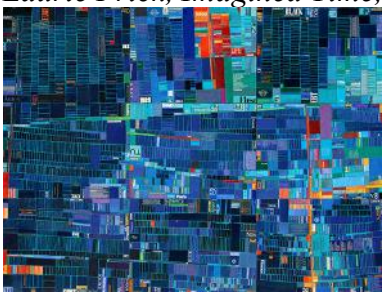
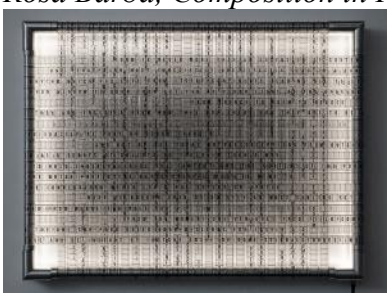


Figure 6
Rosa Barba, Composition in Field, 2022



When body and space become translation media, works present multiple interactive dimensions. Yuyi temporarily attaches digital symbols to skin, granting virtual texts physical experience; Frick uses visualization techniques to transform temporal fluidity into spatial forms; Barba makes symbolic systems vary with viewer movement. These creative strategies reveal how space reshapes textual meaning—symbols are no longer fixed carriers but existences dependent on environment and varying with fields.

From participatory art perspectives, works construct composite relationships among creators, texts, and participants. When viewers enter exhibition spaces, their bodies become elements activating works: in Yuyi's creations, viewers contemplate relationships between digital texts and bodies through gazing at transferred symbols; in Frick's installations, participants experience materialization processes of temporal dimensions through movement; while in Barba's fields, viewer movement trajectories directly influence symbolic interpretation methods. This interaction blurs boundaries between creative subjects and receiving objects, generating new meanings in each participation: texts are no longer static viewing objects but symbolic systems capable of continuous generation through spatial and bodily interactions.

Medium Transformation and Technological Intervention

Figure 7
Pablo Rochat, @pablo.rochat, 2018

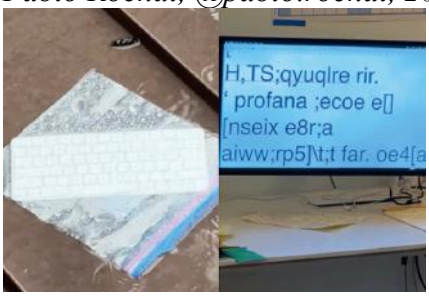


Figure 8
Yehwan Song, X Virtual, 2023

Figure 9
Masumi Kobayashi, Seeds Letters, 1999

In digital age artistic practice, medium and technological intervention redefine symbolic operational modes. American artist Pablo Rochat explores symbolic real-time interactivity through Instagram (@pablo.rochat) (2018–) (Figure 7), Korean creator Yehwan Song's *X Virtua*l (2023) constructs new symbolic logic in virtual spaces (Figure 8), while Japanese artist Masumi Kobayashi's *Seeds Letters* (1999) combines biotechnology with symbolic systems (Figure 9), demonstrating multiple possibilities of contemporary textual carriers. Rochat utilizes algorithmic characteristics to create symbolic fluidity; Song deconstructs existing symbolic rules in virtual fields; while Kobayashi realizes relationships between symbols and living organisms through plant growth processes.

Technological intervention brings qualitative changes to symbolic systems, generating new forms of textual existence. Rochat's symbols created on social platforms can respond to user behaviors in real-time, granting texts interactivity and communicative power; Song reweaves symbolic systems in virtual spaces, breaking physical world limitations and constructing variable reading experiences; while Kobayashi transforms textual symbols into parts of plant DNA, causing variations through growth processes. These creative strategies demonstrate how media change symbolic essence—texts are no longer constrained by single carriers but can freely transform, reorganize, and evolve across different technological platforms.

From future media development perspectives, these works predict more possibilities for symbolic systems. Contemporary technology enables texts to escape traditional carriers, expanding operational domains in social media, virtual spaces, and bio-art fields. Rochat's creations show how symbols adapt to social media immediacy; Song's experiments reveal symbolic fluidity qualities in virtual spaces; while Kobayashi's works open attempts at combining bio-art with symbolic systems. Cross-media practice not only deconstructs existing symbolic operational modes but predicts possible evolutionary directions: symbols will continue integrating with emerging technologies, developing more complex meaning-making systems across digital, virtual, and biological multiple dimensions.

Try, Fail, and Overcome: Interdisciplinary Intensive Workshop

This research examines the 2021 Shih Chien University “Try, Fail and Overcome” interdisciplinary intensive workshop as a research subject, employing qualitative research methods to explore the evolution of post-textual practice in contemporary cultural contexts. The workshop brought together 28 participants from different learning stages (including undergraduate and graduate students), exploring the transformation process of texts from symbolic systems to emotional experiences through seven days of discussion and practice. This transformation process not only challenges traditional semiotic theoretical frameworks but provides new dimensions of thinking for perceptual construction processes in

contemporary typography education. The research framework is established on four main aspects:

Innovation in Teaching Strategies

From semiotic theoretical foundations to practical creation, this research is based on Peirce's triadic sign relations and Barthes' semiotic analytical methods, designing multi-layered experiential learning mechanisms. Under Peirce's theoretical framework, the workshop develops creation through three symbolic types: iconic signs embodied in intuitive representations of typographic forms and visual elements; symbolic signs applied to meaning translation in cross-cultural contexts; and indexical signs manifested in spatial field indication systems and circulation design (Barthes, 2021).

Semiotic Theoretical Foundations

In the keynote lecture phase, semiotic theoretical foundations are established, exploring iconicity and symbolism in typography, employing Barthes' methods to deconstruct denotation and connotation (Barthes, 2021). Denotation is embodied in font selection, color application, and material collection (Figures 10-12), while connotation generates new meaning layers through destructive reorganization of elements. In the material research and process-oriented stage, through exploration of paper texture, printing crafts, and heterogeneous material integration (Figures 13-15), understanding of symbolic operations is deepened. The process of research and reflection promotes material language transformation, expanding experimental qualities of visual expression through semiotic theoretical construction.

Figure 10
Discussion of Layout Through Practical Cases

Figure 11
Discussion of Materials Through Practical Cases

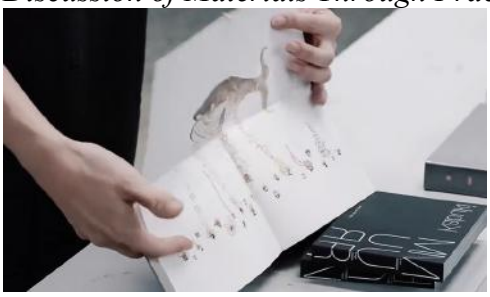
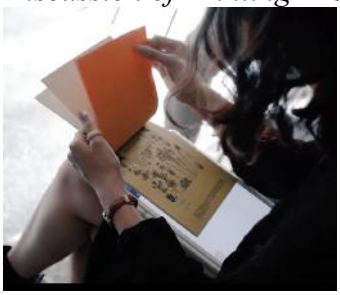


Figure 12
Discussion of Color Usage Through Practical Cases

Figure 13
Discussion of Binding Through Practical Cases

Figure 14
Discussion of Paper Texture Through Practical Cases

Figure 15
Discussion of Printing Process Applications Through Practical Cases



Spatial Field Transformation

Figure 16
150×150cm Floor Space

The workshop field combines multiple perspectives of plan and elevation, utilizing concepts of "difference" and "opposition" in semiotics (Barthes, 2021), creating works in 150×150cm floor space (Figure 16), 235×175cm glass wall surfaces (Figure 17), and 270×75cm narrow vertical glass panels (Figure 18). Spatial configuration considers factors such as light changes, textural characteristics, and viewing distances, treating traces of friction and damage during use as extensions of meaning construction. Viewers create multi-layered reading sequences through bodily interventions such as walking, crouching, and lying down. The oppositional qualities of vertical and horizontal, transparent and reflective, ground and wall, along with differential relationships among the three fields, form systematic transformations of visual language.

Figure 17
235×175cm Glass Wall Surface

Figure 18
270×75cm Narrow Vertical Glass Panel

Cross-Sensory Experience Design

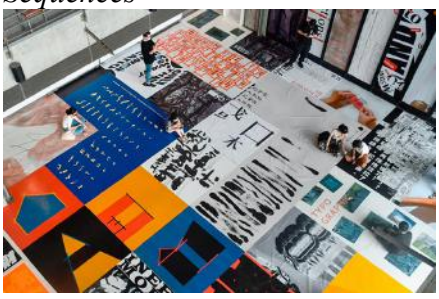
Changing traditional visual display modes, intimate dialogue spaces are constructed through Audio Tours (Figure 19). Viewers listen to creators' intimate sharing via QR codes, blurring boundaries between creation and viewing. Participants can develop experience sequences

according to personal choice (Figure 20): silent observation followed by listening to creative discourse, or following paths guided by voice narratives. Environmental sound qualities of the exhibition space are simultaneously preserved, interweaving with personalized audio guides, enabling participants to continuously adjust perceptual positions during spatial movement (Figure 21). Through integration of multiple perceptual systems, texts unfold new forms of signification in the digital age, revealing connections between contemporary texts and emotional construction.

Figure 19
Developing Personal Experience Sequences Through Audio Tour

Figure 20
Participants Continuously Adjusting Viewing Positions in Space

Figure 21
Viewers Intervening in Works Through Different Postures, Creating Multi-layered Reading Sequences



Establishment of Interactive Forms

The research observes how participants develop personalized expressive vocabularies through trial and failure. The workshop encourages breaking through established thinking frameworks, allowing texts to generate new interpretive possibilities through viewers' bodily participation. This interaction involves not only visual perception but also secondary message construction arising from behaviors such as movement and touch.

This research's contribution to contemporary design education can be explored from three levels: (1) In theoretical construction, the research integrates semiotics and emotional theory, establishing new analytical frameworks. It not only breaks through limitations of traditional semiotics but pioneers new perspectives for exploring emotional experiences, transforming our understanding of textual forms of expression. (2) At the practical level, it proposes a structured, operable teaching model, particularly emphasizing the positive role of trial and failure in the creative process, redefining relationships among proposal, execution, and outcomes. (3) At the methodological level, it establishes systematic observation frameworks, including phenomenological recording, process analysis, and outcome evaluation, ensuring research rigor while facilitating understanding of information transformation in creative processes, providing complete reference paradigms for subsequent related research.

Development and Planning of Post-textual Practice

Current Development Review

Research findings reveal three transformations in creative attitudes: from standard answers to multiple possibilities, from single media to cross-media experimentation, and from symbolic transmission to emotional experience construction. At the perceptual level, we observed the iconographic transformation of textual symbols, emotional connections in voice narratives, dynamic experiences through bodily movement, and temporality brought by light and shadow changes.

In the digital age, when text transcends planes to enter spatial domains, its meaning has surpassed traditional unidirectional interpretation. Viewers transform from passive recipients to active participants, developing interpretive possibilities within space. Simultaneously, “failure” experiences in the creative process transform into opportunities for innovative thinking, providing new pathways for contemporary cultural studies.

Exhibition observations demonstrate that when text enters three-dimensional fields, viewers and works form dialogic interactions. Through bodily exploration, sonic resonance, and environmental element interactions, reading expands from surface-level symbolic decoding to sensory-interwoven experiences. Post-textual practice constructs entirely new perceptual frameworks, where meaning production maintains openness and continuously generates interpretive possibilities through viewer intervention.

Research Methodology Deepening

This research will establish systematic research archives through multimedia documentation, creative notes, and discussion records, comprehensively preserving symbolic evolution trajectories throughout experimental processes. We will document real-time interactive patterns between viewers and texts, conduct in-depth interviews, and explore how visual element transformations influence linguistic symbol understanding and experience construction. Simultaneously, we will employ technology to explore integration possibilities between virtual and physical spaces, creating richer layers of symbolic transformation and experience through multi-sensory environmental cultivation.

Research Implications and Prospects

This research will establish systematic theoretical foundations for post-textual practice, deepening the academic positioning of linguistic symbols in the digital age. It emphasizes analyzing dynamic relationships among creators, texts, and viewers, exploring meaning production modes within visual culture. Through triadic interactions, we aim to open new horizons for semiotic research. Research outcomes will be applied to visual communication fields, establishing systematized workshop models that provide innovative pathways and multiple practical possibilities for linguistic symbol transformation.

Conclusion

This research originated from investigating how digital environments reshape textual reading experiences, focusing on transformations in cross-sensory perception and emotional transmission. Through empirical workshop research, we observed that contemporary technological intervention not only altered carrier forms but facilitated text's transition from “static carriers” to “interactive systems,” profoundly influencing cognitive patterns and emotional communication modes. This transformation continues the evolutionary trajectory of textual carriers throughout human civilization—from stone inscriptions and bamboo slips to printing—with each stage redefining the relationship between humans and symbols. Within this evolutionary process, text no longer serves merely as a medium for knowledge transmission but becomes a dynamic field connecting past and present, individual and collective, reflecting humanity's continuous exploration of symbolic utilization and meaning construction.

From the intersecting perspectives of semiotics and affective theory, textual evolution presents a unique historical trajectory: from symbolic systems established by ancient civilizations, through knowledge dissemination models of the industrial era, to interactive experiences generated by contemporary digital technology. Workshop practice particularly demonstrated new possibilities of this evolution in contemporary contexts: through scalar transformation of creative fields, multiplicity of viewing perspectives, and immediacy of bodily intervention, participants transcended traditional symbolic interpretation frameworks. In the process of visual symbols transforming toward emotional experiences, the interweaving of environmental elements and bodily experiences enabled participants to undergo processes from attempt through failure to breakthrough, collectively constructing new perceptual modes. This practice not only validated characteristics of the post-textual era but pioneered new pathways for symbolic-emotional integration.

This research's findings address three key issues: first, digital environments reconstruct traditional reading experiences through perceptual integration and emotional experience deepening; second, text evolves from singular symbolic systems to multiple interactive fields under digital technology's influence; third, the three-dimensional relationship among creators, carriers, and viewers undergoes fundamental transformation—creators shift from information transmitters to experience designers, textual carriers expand from static planes to dynamic fields, and viewers transform from passive recipients to meaning co-constructors. These explorations not only extend our understanding of contemporary culture but open new spaces for discussing human cognitive evolution.

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The Role of Dynamic Marketing Capabilities in Enhancing Entrepreneurial Marketing for MSMEs in the Special Region of Yogyakarta Province

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Abstract

This study investigates the relationship between dynamic marketing capabilities (DMCs) and entrepreneurial marketing (EM) among micro, small, and medium enterprises (MSMEs) in the Special Region of Yogyakarta Province, Indonesia. Using a quantitative approach, data were collected through online and offline surveys involving 232 MSME respondents. The data were analyzed using Smart-PLS to evaluate the influence of two dimensions of DMC, namely market-responding capabilities and marketing resource rebuilding capabilities, on seven dimensions of EM, including proactiveness, innovation, risk-taking, opportunity focus, customer intensity, resource leveraging, and value creation. The results show that market-responding capabilities significantly influence all dimensions of EM. In contrast, marketing resource rebuilding capabilities affect all EM dimensions except customer intensity. These findings highlight the essential role of dynamic marketing capabilities in strengthening entrepreneurial behaviors within MSMEs, enabling them to respond swiftly to market changes and improve their competitiveness. This research contributes to the strategic marketing literature by emphasizing the synergy between adaptability and entrepreneurial orientation in enhancing MSME performance in dynamic business environments.

Keywords: dynamic marketing capabilities, entrepreneurial marketing, MSMEs

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Introduction

In a dynamic market, consumer behavior changes over time as consumer requirements and desires shift. Marketers' attention is essential for developing creative strategies that can enable businesses to adapt to these consumer behavior changes, including applying dynamic capabilities. Micro, small, and medium-sized enterprises (MSMEs), some of the drivers of Indonesia's economy, have demonstrated how dynamic marketing capabilities can enhance corporate performance. As reflected in various current events, these capabilities are essential for business development, specifically for MSMEs, which will be explored here as research objectives.

The development of free competition highlights the importance of implementing a plan that incorporates dynamic marketing capabilities. Free trade encourages marketers to enter overseas markets with increased competitiveness (Alon et al., 2021). The competitive nature of free trade requires marketers to adapt their tactics to the ever-changing environment by focusing on consumer demands and needs (Samiee & Chirapanda, 2019). It is where dynamic marketing capabilities become key to their success in the free market. Strategic application of these capabilities involves developing a competitive advantage through product or service innovation (Wang et al., 2022).

Entrepreneurial marketing refers to the behaviors of entrepreneurs who combine their entrepreneurial spirit with their ability to implement strategies for marketing. Micro, small, and medium entrepreneurs with strong entrepreneurial marketing abilities can endure and thrive in a dynamic business environment by being innovative, proactive, and willing to take risks (Kanapathipillai et al., 2022). Entrepreneurial marketing can assist these entrepreneurs in their development (Gilmore, 2011), as innovative and imaginative market-development strategies are important for them. MSMEs that practice entrepreneurial marketing concepts may be more responsive to market changes and proactive in creating additional value for consumers.

As dynamic marketing capabilities refer to an organization’s capacity to continually adapt its marketing strategies to market changes, entrepreneurial marketing focuses on innovation, risk-taking, and creativity in developing new and distinctive marketing strategies. The synergy between the two enables businesses to remain competitive and relevant in a changing marketplace. By combining these two concepts, businesses can be more attuned to market changes and remain competitive by developing new marketing tactics. Kaml (2022) and Kanapathipillai et al. (2022) provide evidence of how dynamic marketing capabilities impact entrepreneurial marketing. The theoretical studies and findings of these experts have inspired the researchers in this study to explore the interlink between the two concepts even further.

The relationship between dynamic marketing capabilities and entrepreneurial success may vary depending on the specific context and industry in which a business conducts its operations. For example, in highly competitive markets, having the ability to rapidly adapt and innovate marketing strategies can be a key driver of success for entrepreneurs (Kachouie et al., 2018). On the other hand, in more stable industries, a focus on maintaining and optimizing existing marketing capabilities may be more crucial for entrepreneurial ventures to thrive (Ferreira et al., 2020). Understanding how dynamic marketing capabilities impact entrepreneurial marketing can provide valuable insights for businesses that look to stay ahead in today's fast-paced and ever-changing marketplace. These capabilities are crucial for companies to stay competitive and adapt to changing environments.

Entrepreneurial marketing is relevant in the context of MSME development (Gyanwali & Bunchapattanasakda, 2020; Sadiku-Dushi et al., 2019). This is because MSMEs need to carry out innovative and creative strategies that are oriented toward market development. By applying the principles of entrepreneurial marketing, MSMEs can be more responsive to market changes and more proactive in creating added value for customers (Dzogbenuku & Keelson, 2019; Gyanwali & Bunchapattanasakda, 2020). Entrepreneurial marketing in the context of MSMEs focuses on innovative strategies and tactics for these enterprises to develop their market share and reach their target audiences effectively. Incorporating creativity, flexibility, and a deep understanding of consumer behavior, entrepreneurial marketing provides a competitive advantage for MSMEs in today's dynamic business landscape (Dhameria et al., 2021). Through a combination of entrepreneurial marketing techniques, MSMEs can differentiate themselves from larger competitors and attract a loyal customer base. In addition, entrepreneurial marketing encourages them to continuously adapt and develop their strategies in response to changing market trends, thus ensuring long-term success and sustainability (Zahara et al., 2023). With the right entrepreneurial mindset and marketing approach, small businesses can thrive and succeed in an increasingly competitive market environment. Therefore, it is very appropriate to assume that MSMEs that have high dynamic marketing capabilities also have high entrepreneurial marketing capabilities (Hidayatullah et al., 2019).

A discussion on the relationship between dynamic capabilities and entrepreneurial marketing was once raised by Kanapathipillai et al. (2022). They verified that businesswomen in Malaysia who engage in dynamic capabilities will be able to apply entrepreneurial marketing strategies in their enterprises. Kaml (2022) also specifically discussed the influence of dynamic marketing capabilities on entrepreneurial marketing. According to the study, internal dynamic marketing capabilities are reflected in the ability to learn across all entrepreneurial marketing practices, while external dynamic marketing capabilities are reflected in the ability to manage the brand across all entrepreneurial marketing practices. The limitations of studies that explored in depth the relationship between both sets of capabilities make this topic an intriguing subject to study further. By examining this relationship in the MSME context, this study offers novelty to the literature on this topic.

One of the key factors that is thought to be able to support MSMEs is the ability to respond quickly to environmental changes, especially by utilizing digital technology. The implementation of this strategy proves businesses' success in utilizing dynamic marketing capabilities. During the COVID-19 pandemic, dynamic marketing capabilities were applied by, among others, using various online applications to promote, market, and distribute products and services (Plekhanov et al., 2022). MSMEs implement strategies that incorporate dynamic marketing capabilities during this period by changing their businesses into digital-based innovative businesses (Peñarroya-Farell & Miralles, 2022; Putritamara et al., 2023; Rupeika-Apoga et al., 2022). According to the *Food and Beverage Service Activities Statistics* published by Statistics Indonesia (BPS) in 2023, the number of food and beverage business units in Indonesia reached approximately 4.85 million in 2023, a significant increase from 4.01 million in 2016. This notable growth reflects the increasing demand for food services and the expansion of culinary businesses across the country, driven by changing consumer behavior, digitalization, and the rising popularity of online food delivery services. The steady upward trend underscores the dynamic and resilient nature of Indonesia's food and beverage industry, which continues to adapt to technological and market shifts (Badan Pusat Statistik, 2023). This fact shows that digitalization has changed the way of life of both individuals and businesses and brought new habits in the post-COVID-19 era (Annamalah et al., 2023; Harti, 2023).

However, some MSMEs in Indonesia still face a dynamic business environment. Some of the difficulties experienced by MSMEs in Indonesia include struggles with the decisions on adopting technology to conduct digital-based business transformations (Anatan & Nur, 2023) and difficulties adapting to changes in competitive environments (Muafi & Roostika, 2022). The selection of MSMEs in the Special Region of Yogyakarta Province as research subjects was based on research findings by Dari and Isfianadewi (2020), who reported that the ability of MSMEs in this area to compete with other business actors is still low. This gap between MSMEs suggests the urgency to investigate this issue in greater depth.

Literature Review and Hypotheses Development

Dynamic marketing capabilities (DMC) are grounded in the Dynamic Capabilities View (DCV), which extends the Resource-Based View (RBV) to environments characterized by rapid and unpredictable changes. These capabilities enable organizations to adapt, integrate, and reconfigure their marketing resources in response to evolving market conditions. Roach et al. (2018) define DMC as marketing tools that transform internal organizational resources into value for consumers in a shifting market context. Similarly, Morgan et al. (2018) argue that DMCs are essential for firms to adjust their strategies based on market fluctuations. Kwon (2021) identifies two key dimensions of DMC: market responding capabilities (MRC) and marketing resource rebuilding capabilities (MRCC). MRC refers to a firm's capacity to identify and respond effectively to market signals, while MRCC emphasizes the ability to reallocate and rebuild marketing resources, particularly in dynamic and uncertain environments. These two dimensions are adopted in this study to measure the construct of dynamic marketing capabilities.

Past literature (Pavlou & El Sawy, 2011; Protogerou et al., 2012; Teece et al., 2009) supports the idea that dynamic capabilities involve environmental monitoring, internal process adaptation, and alignment of offerings with market demand. Barrales-Molina et al. (2017) and Kwon (2021) assert that marketing resources and capabilities complement each other in driving both firm and customer outcomes. In this research, MRC and MRCC are proposed to influence various dimensions of entrepreneurial marketing, particularly in MSME contexts where agility and innovation are crucial.

Entrepreneurial marketing (EM) combines entrepreneurial thinking with market responsiveness. It emphasizes innovativeness, risk-taking, customer value, and proactive strategies (Morris et al., 2002). EM includes dimensions such as proactiveness (Lumpkin & Dess, 2001), risk-taking, innovation, opportunity focus (Kilenthong et al., 2016), resource leveraging (Becherer et al., 2012), customer intensity, and value creation. For MSMEs, EM is a strategic necessity, enabling them to respond quickly to market dynamics and operate effectively despite resource limitations (Gilmore, 2011).

Recent studies have begun to explore the synergy between DMC and EM. For example, Eggers et al. (2020) developed a scale of entrepreneurial marketing and found that firms with greater adaptability to market change and an expression of DMC tend to perform better in dynamic environments. Roach et al. (2018) emphasize the mediating role of dynamic marketing capabilities in enhancing innovativeness, one of the core dimensions of entrepreneurial marketing. Ferreira et al. (2020) and Zahara et al. (2023) also highlight that dynamic capabilities, when integrated with an entrepreneurial orientation, contribute significantly to marketing performance and firm resilience. These studies support the idea that the implementation of DMC strengthens the firm’s capacity for opportunity recognition,

innovation, and customer value delivery—all of which are central to EM. However, empirical research examining the direct influence of MRC and MRCC on each dimension of EM, particularly in the MSME context, remains limited—creating a gap that this study seeks to address.

This study proposes the following hypotheses to explore the influence of DMC on EM:

H1: Market responding capabilities positively influence proactiveness.
H2: Market responding capabilities positively influence focus on opportunities.
H3: Market responding capabilities positively influence calculated risk-taking.
H4: Market responding capabilities positively influence innovation.
H5: Market responding capabilities positively influence customer intensity.
H6: Market responding capabilities positively influence resource utilization.
H7: Market responding capabilities positively influence value creation.
H8: Marketing resource rebuilding capabilities positively influence proactiveness.
H9: Marketing resource rebuilding capabilities positively influence focus on opportunities.
H10: Marketing resource rebuilding capabilities positively influence calculated risk-taking.
H11: Marketing resource rebuilding capabilities positively influence innovation.
H12: Marketing resource rebuilding capabilities positively influence customer intensity.
H13: Marketing resource rebuilding capabilities positively influence resource utilization.
H14: Marketing resource rebuilding capabilities positively influence value creation.

These hypotheses reflect the expectation that dynamic and adaptive marketing capabilities serve as strategic enablers of entrepreneurial behaviors in MSMEs, ultimately contributing to improved marketing performance and sustainable competitiveness.

Methods

The population for this study consists of micro, small, and medium-sized companies (MSMEs) from various sectors and industries in Yogyakarta. A subset of the population, including traditional markets, was sampled to represent the study, using a sampling method that was selected according to the study's objectives to yield accurate results. This study employs convenience sampling, which is a sampling strategy that is based on the availability of items and the simplicity of obtaining them. Data were collected both online via Google Forms and offline by visiting MSME hubs in Yogyakarta. These data were analyzed using the Smart-PLS statistical tool. A total of 232 respondents (195 online and 35 offline) participated in this study by completing the questionnaire during the data collection period from March to April 2024. This primary data was collected directly by the authors.

Results and Discussion

The respondents of this study consisted of micro, small, and medium enterprises (MSME) actors in Yogyakarta, with the majority serving as business managers (232 individuals, 83.2%) and a smaller portion as owners (39 individuals, 16.8%). Most businesses operated in the culinary sector (41.8%), followed by fashion (17.7%), handicrafts (8.2%), retail (4.3%), services (2.6%), and agriculture (0.9%). In terms of business tenure, the majority had operated for 1–5 years (47%), followed by 6–10 years (13.4%) and 11–15 years (9.5%). Regarding

annual sales, 61.6% reported sales of less than IDR 300 million, 27.6% between IDR 300 million and 2.5 billion, and 10.8% between IDR 2.5 billion and 50 billion, indicating a concentration of micro and small businesses among the respondents.

The last characteristic presented in this study relates to the total sales of the business over the past year. Based on their annual sales, as regulated by a government regulation in 2021, MSMEs are classified into three types: 1) micro businesses, which have annual sales of a maximum of IDR 2 billion; 2) small businesses, which have annual sales of more than IDR 2 billion and no more than IDR 15 billion; and 3) medium businesses, which have annual sales of more than IDR 15 billion and no more than IDR 50 billion [Government Regulation No. 7/2021 concerning Ease, Protection, and Empowerment of Cooperatives and Micro, Small, and Medium-sized Enterprises, 2021).

After classifying respondents, the validity of the data was tested, starting from the convergent validity. According to Hair et al. (2014), convergent validity is the extent to which a measure is positively correlated with alternative measures of the same construct. Therefore, items that are indicators (measures) of a particular reflective construct must converge or share a high proportion of variance. Convergent validity was assessed using the outer loading values of each indicator, following the criteria established by Hair et al. (2019), which recommends that individual item loadings should be ≥ 0.70 to indicate adequate convergence. The results show that most indicators across constructs, including innovativeness (INV), market responding capability (MRC), marketing resource rebuilding capability (MRCC), opportunity focus (OPP), proactiveness (PRO), risk-taking (RISK), resource leveraging (RSC), and value creation (VAL), exhibited loadings above the 0.70 threshold. A few items, such as INCS1 (0.642), OPP1 (0.644), PRO5 (0.645), and RISK2 (0.644), had loadings slightly below 0.70. However, these values are still acceptable in exploratory research, especially when their removal would reduce content validity or overall construct reliability. Overall, the vast majority of indicators demonstrated satisfactory loadings, supporting the model's convergent validity and confirming that the measurement items appropriately reflect their respective constructs.

The internal consistency reliability of all constructs in this study was evaluated using Cronbach's Alpha, Composite Reliability (CR), and rho_A, as recommended by Hair et al. (2019). The Cronbach's alpha values ranged from 0.717 to 0.854, exceeding the minimum threshold of 0.70, indicating acceptable internal consistency across constructs. The composite reliability values, which provide a more accurate reliability estimation in PLS-SEM, ranged from 0.824 to 0.896, well above the recommended 0.70 benchmark. Similarly, all rho_A values were above 0.70, confirming internal consistency without redundancy. Additionally, all constructs met the convergent validity criterion, with Average Variance Extracted (AVE) values above 0.50. These findings confirm that the measurement model demonstrates sufficient reliability and validity, indicating that the indicators used reliably represent the underlying constructs. Thus, the model is deemed appropriate for further analysis using structural equation modeling (Hair et al., 2019).

The path coefficient analysis reveals that both Market Responding Capability (MRC) and Marketing Resource Rebuilding Capability (MRCC) significantly influence various dimensions of Entrepreneurial Marketing (EM) among MSMEs. MRC shows strong positive effects on all EM constructs, particularly on Proactiveness ($\beta = 0.215$, $t = 6.919$, $p < 0.001$), followed by Risk-taking ($\beta = 0.151$), Innovativeness ($\beta = 0.165$), and Customer Intensity ($\beta = 0.174$). Similarly, MRCC demonstrates significant effects on nearly all EM dimensions, with the strongest influence on Opportunity Focus ($\beta = 0.190$, $t = 5.542$, $p < 0.001$), Value Creation

(β = 0.170), and Resource Leveraging (β = 0.166). However, MRCC's effect on Customer Intensity (β = 0.085, p = 0.070) is not statistically significant at the 0.05 level, indicating a relatively weaker link. These findings underscore the critical role of dynamic marketing capabilities in shaping entrepreneurial behavior, especially in enhancing adaptability and opportunity recognition.

In addition to the path coefficients, the analysis also considered the mean and standard deviation (SD) values for each path. The mean values represent the average strength of the relationships based on bootstrapping procedures, with most coefficients ranging between 0.09 and 0.21, indicating moderate effect sizes. The relatively low standard deviations (ranging from 0.063 to 0.098) suggest that the estimated path coefficients are stable and consistent across resamples. This level of precision reinforces the robustness of the model. According to Hair et al. (2019), low standard deviation and high t-statistics further confirm that the observed relationships are not due to random variation, thereby supporting the reliability of the structural model.

Conclusion and Limitations

This study provides empirical evidence on the strategic role of dynamic marketing capabilities, specifically *market responding capabilities (MRC)* and *marketing resource rebuilding capabilities (MRCC)*, in shaping the entrepreneurial marketing behavior of MSMEs in Yogyakarta. The results indicate that MRC significantly enhances MSMEs' ability to adapt to changes in market preferences and consumer behavior. This agility is essential for maintaining competitiveness in dynamic business environments, particularly for smaller firms facing resource constraints. Responsive firms can identify shifts in demand, adjust their offerings, and move faster than larger competitors, enabling them to seize market opportunities and deliver superior value (Zahara et al., 2023).

A key finding is the strong relationship between MRC and opportunity focus, where responsive firms are more likely to anticipate and act upon market trends. This capacity fosters innovation and enables MSMEs to remain relevant in rapidly evolving markets (Octasylva et al., 2022; Sugiyart & Ardyan, 2017). Similarly, the positive effect of MRC on proactiveness reinforces the argument that MSMEs can lead change rather than just respond to it. Proactive firms are more capable of initiating strategic moves and are better positioned to generate sustainable growth (Al-Mamary & Alshallaqi, 2022; Brege & Kindström, 2020).

MRC also positively affects innovation. MSMEs with strong responsiveness capabilities are better at integrating customer feedback and market signals into the development of new products or services. Innovation, in this context, becomes a vital mediator between responsiveness and performance, affirming prior findings that adaptive behavior fuels creativity and market success (Octasylva et al., 2022). Furthermore, MRC influences calculated risk-taking, an essential entrepreneurial behavior. Entrepreneurs who can anticipate market changes are more likely to take informed risks, especially in uncertain or export markets (Manzi-Puertas et al., 2024; Reimann et al., 2021).

In addition, the study shows that MRC enhances customer intensity—the extent to which firms prioritize understanding and engaging with their customers. Market-responsive MSMEs can align their offerings with customer expectations, leading to stronger loyalty and satisfaction (Eggers et al., 2020). MRC also supports better resource leveraging, which refers to the effective use of limited resources to maximize strategic outcomes. Firms with strong MRC can

channel their efforts where they matter most, increasing efficiency and impact. Likewise, value creation is significantly influenced by MRC. Firms that are market-sensitive tend to better understand what customers value, enabling them to deliver unique solutions that enhance competitiveness and differentiation.

The role of marketing resource rebuilding capabilities (MRCC) is equally significant in this study. MRCC reflects a firm's ability to reconfigure its internal marketing resources in response to external shifts. The analysis shows that MRCC strongly correlates with proactiveness, where firms that can adapt their internal assets are more likely to act ahead of market changes (Afriyie et al., 2019). It also contributes to opportunity focus, helping MSMEs to redirect resources toward emerging market demands (Kwon, 2021).

MRCC further enables calculated risk-taking by fostering internal flexibility. Firms that regularly evaluate and rebuild their marketing strategies are better equipped to take risks that could lead to growth (Annamalah et al., 2023; Morrish & Jones, 2020). The relationship between MRCC and innovation is also confirmed, where firms that possess resource agility tend to be more innovative and better prepared to deliver differentiated offerings (Kwon, 2021).

Moreover, MRCC positively impacts resource leveraging, allowing MSMEs to use existing assets more efficiently for strategic advantage. It also plays an important role in value creation by supporting strategic alignment between internal capabilities and external expectations. Entrepreneurs in Yogyakarta were found to actively rebuild their marketing capacity as a way to consistently offer meaningful value, which contributes to customer loyalty and business growth (Kwon, 2021; Möller & Törrönen, 2003).

Interestingly, this study finds no significant relationship between MRCC and customer intensity. This may reflect the informal and simple structure of many MSMEs in Yogyakarta, where internal efficiency is prioritized over complex customer engagement strategies (Homburg & Tischer, 2023; Hung et al., 2020). Many of these firms focus on ensuring consistent product quality and operational strength as their means to maintain customer satisfaction, rather than scaling aggressive outreach or relationship management efforts.

Lastly, the study emphasizes the complementarity between MRC and MRCC**.** MRC enables MSMEs to respond quickly to external change, while MRCC strengthens their internal ability to adapt and reallocate resources. Together, these capabilities form a solid foundation for entrepreneurial marketing behavior and strategic responsiveness. Their combined effect on innovation, opportunity identification, risk management, resource optimization, and value creation illustrates how MSMEs can strategically compete and grow in today's volatile business landscape (Ogundare & Van der Merwe, 2023; Zahara et al., 2023).

In conclusion, dynamic marketing capabilities are critical enablers of entrepreneurial marketing. MSMEs that invest in developing both external responsiveness (MRC) and internal adaptability (MRCC) are better positioned to succeed in uncertain environments. Policymakers and practitioners aiming to strengthen MSMEs should support initiatives that build these capabilities through digital transformation, market intelligence training, and innovation-focused marketing strategies to promote sustainable and inclusive economic growth.

This study highlights the practical importance of dynamic marketing capabilities in enhancing entrepreneurial marketing among MSMEs. To remain competitive, SMEs must be agile, innovative, and responsive to market changes while consistently creating value for customers

and building strong stakeholder relationships. These capabilities are essential in navigating today's fast-changing business environment.

However, the study is limited by its focus on a single industry and reliance on self-reported data. Future research should explore diverse sectors and apply more objective performance measures. Despite these constraints, the findings offer meaningful guidance for MSMEs aiming to strengthen their marketing strategies and achieve long-term competitive advantage.

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Altered Perception and Situations of Disability: A Case Study of the Sensitive Experience of Women in Labor During Birth

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Abstract

This study examines the impact of the ambiance in birth spaces on the experience of its specific user, the woman in labor, during childbirth. It highlights how her perception of the ambiance can be temporarily altered in this context. Using a combination of qualitative and quantitative in situ approaches, we analyzed the ambiance of two distinct birth space settings, in Tunis and Grenoble. An experimental protocol was developed to identify typical situations of disability in these two environments. This analysis was based on three dimensions of ambiance: spatial, physical, and emotional. This work aims to catalog the situations of disability experienced by women in labor during childbirth. The results, comparing the two study contexts, reveal that certain situations have a significant impact on the well-being and sensory experience of women during labor. These results pave the way for new perspectives on using ambiance as a tool for spatial design in contexts involving situations of disability. These results highlight new ways to use ambiance in spatial design for situations involving disability. These results offer new insights into utilizing ambiance as a tool for spatial design in contexts characterized by situations of disability.

Keywords: childbirth, birth space, altered perception, situations of disability

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Introduction

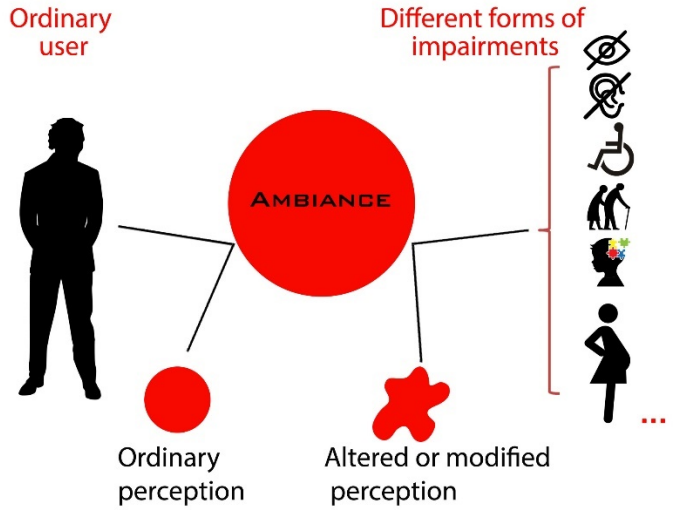
The experience of space varies. It depends on the user involved. This experience encompasses a variety of contexts, relationships and interrelationships. In other words, it situates the human being in relation to an inner world (through his perception, emotional and subjective interpretation of his environment) and an outer world (spatial and socio-cultural). He does not always encounter ordinary situations. In fact, he is often struggling with his environment. Those specific situations are marked by an incompatibility between his environment and his physical and/or mental abilities. It places him in situations of vulnerability, fragility, and difficulty.

Focusing on space's user represents the heart of various reflections on architectural and urban ambiances and their perceptions. Thus, the perception of ambiance is not reduced to the ordinary, to standards and norms. It depends on the specificity of the perceiving subject and the spatio-temporal conditions in which he is immersed. It is then relative to the sensory capacities of the perceiver in a given context. This is why any form of sensory impairment could lead to an imbalance at the perceptual level and could cause an alteration in the perception of ambiances. This alteration does not diminish perception but makes it "different" or "modified". This brings us back to the notion of "altered perception" of ambiance. We describe it as a distortion of our perception of reality under the influence of factors internal or external to our being in the world. We can then affirm that the alteration of the ambiance's perception is the result of an imbalance between the perceiving subject, the physical and sensitive qualities of space and others (Aroua et al., 2020).

Various studies have focused on specific sensory profiles with an altered perception of the space. The sensory parameters relate to the visual (Thomas, 2000), cognitive and behavioural (Layeb, 2020), auditory and age-related (Hussein et al., 2015) abilities. These studies have focused on finding design solutions to overcome situations of disability by creating appropriate devices. They are designed depending on the impairment. They assist with mobility and provide easy access to the space. They are called "architectural prostheses" (Thomas, 2000). Their primary objective is to place the user at the centre of the design process and resilient architectural thinking. This architectural and urban research focused on users who have a different relationship with the world. They are based on space affordances (Gibson, 1979) and how it integrates the various forms of user vulnerabilities. The approach is qualitative and far removed from the health management of disability.

Our research on the woman in labor in birth spaces (Aroua et al., 2020; Aroua & Hussein, 2020; Aroua & Hussein, 2024) is in line with the reflections on the alterations of perception of ambiances (Figure 1). A study of her sensitive experience will focus on the ambiances of the birth space, the singularity of her profile and the particularities of the childbirth event. This study will examine the affordances of the space (Gibson, 1979). It makes birth space a well-being support.

Figure 1
Different Forms of Alteration of Ambiances' Perception



The Woman in Labor: A Specific User

The birth event is announced by pain (Wijma & Wijma, 2017). It characterizes the woman as a human being in a vulnerable situation. It has a significant impact on both psychological and physiological levels. It plunges the woman into a state of disruption or disconnection from her environment. The woman loses control of her body, particularly during labor (England & Horowitz, 1998). As explained in the field of neuropsychology, the peaks of endogenous oxytocin during labor and the progressive release of endorphins in the maternal brain can potentially trigger this modification of consciousness (Olza, et al., 2018). This altered state of consciousness can occur spontaneously in the woman during labor, and increase as it progresses (England & Horowitz, 1998). Obstetric health professionals call this state "birthing consciousness" (Dahan, 2020). It is a temporary and transitory state during which it is extremely difficult to simply act (feel, think, behave) according to normality (Dahan, 2020).

During the labor phase, the change in the woman's consciousness is reflected in an altered perception of time and changes in focus and attention. This altered state can cause alterations in the woman's sensory faculties and perception (England & Horowitz, 1998). Women may be vulnerable at this time. They prefer to be isolated, in their "bubble": "their own world". This state is temporary and marks a transitional phase in a woman's life. It changes her perception of space, her interpretation of the spatio-temporal conditions around her and her relationship with other users. We can say that "birth" as an event affects the women in labor. It creates a disruption. This disruption provokes an upheaval that engenders a change in her frame of reference, her interpretation of the event, and her lived experience.

The birth event marks the woman's world and her perception of the surroundings. It disrupts and reconfigures the world in her eyes. It creates a new form of perception that we call a temporarily "altered" or "modified" perception (Aroua et al., 2020).

Methodology

This study provides insight into childbirth as the woman in labor's sensory experience of birth space. It will investigate hospital institutions that provide care for women in labor

during the different phases of childbirth. Using an in-situ approach, we conducted a spatial and ambiantal characterization of two different birth space contexts, Tunis and Grenoble (Figure 2). Having two different study sites will eventually enrich the reference corpus of this research.

In Grenoble, our fieldwork site includes three birth spaces representative of the three birth models (Davis-Floyd, 2001). The maternity ward at the Grenoble University Hospital Center (CHU) is a technocratic model. The birth center “La Maison” reflects the holistic model. The third space is the maternity ward at the Grenoble Mutualist Hospital Group (GHM), which represents the intermediate model between the technocratic and the holistic model.

For Tunis, we chose the Tunis Maternity and Neonatology Center (CMNT). It represents the technocratic model, the only model available in Tunisia. It is the oldest public institution specialized in childbirth in Tunisia. It is also the first in terms of capacity and types of care provided.

Figure 2

Examples of Delivery Rooms From the Study Corpus

We conducted an exploratory study divided into three levels: spatial characterization, ambiantal characterization, and emotional state capture.

The study in Grenoble was qualitative through observations, visits, and qualitative semi-structured interviews. The participants were eight women who have already given birth in one of the above-mentioned birth spaces. They agreed to share their experiences with us through qualitative interviews. This therefore constituted a form of feedback and a voluntary reactivation of the environment. It is thus a reflection based on lived experience and ambiantal reactivation of birth spaces.

In the Tunisian field, we also conducted a quantitative study. It consisted of noise level measurements and emotional state capture through real-time electrodermal activity (EDA) measurements. The analysis of electrodermal activity revealed the woman in labor 's emotional state in correlation with the observations and interviews. This involves collecting the immediate bodily and emotional reactivity to environmental stimuli in a given situation (Boucsein, 2012). It is done by measuring the electrodermal activity (EDA) of the woman different phases of childbirth (labor, delivery and postpartum). To achieve this, we used a E4 wearable biophysiological sensor from Empatica® (Figure 3). We observed the childbirth experiences of twenty-two Tunisian women in real time. We measured their emotional states during childbirth in collaboration with the medical team. In the final step, we interviewed them after the birth. In addition to the ambiantal reactivation, the study also includes the real-time capturing of ambiances during the childbirth experience in Tunisia.

Figure 3
E4 Wearable Biophysiological Sensor by Empatica ® (www.empatica.com)

Results and Discussion

Based on visits, observations and semi-structured interviews, this study resulted in an inventory of specific situations experienced during childbirth. These situations depend on several components: the spatial dimension (the physical characteristics of the space), the psychological dimension (the woman in labor and her perception of the event), the social dimension (sharing), and the temporal dimension (the different phases of birth event).

The analysis of women's narratives and in-situ observations in the four birth spaces contributed to a better understanding of women's feelings, the desired ambiances and those rejected. During this experience, the woman in labor interacts with the space, using the tools and facilities available in the delivery room. She reacts to sensory environmental stimuli. These stimuli vary depending on the type of birth space. Empirical data analysis revealed the redundancy of certain ambiantal situations and their impacts on the perception of space and the event (Aroua et al., 2020; Aroua & Hussein, 2020; Aroua & Hussein, 2024).

In this article, we present typical situations of disability that women may encounter during childbirth, examining how environmental factors contribute to vulnerability and influence their overall experience.

Situation of Disability: "Disorientation"

It is very interesting to consider spatial orientation within a hospital structure. The design must feature guiding elements, including signage, colors, and overall spatial organization. Visual and spatial cues guide the woman in labor in her path and hospital stay for childbirth. A woman in labor feels more comfortable when the space is human-scaled, familiar, and similar in proportion to a home. However, in larger spaces, she may experience disorientation and a loss of spatial awareness (Setola et al., 2019).

At the CHU Grenoble maternity ward, access points present challenges related to orientation, readability, distance, and spatial visibility. At night, access to the maternity ward is via the pediatric ward, more specifically its emergency unit which is located on the lower ground floor. The path involves walking through several corridors. It is then necessary to take a staircase to go up to the ground floor, followed by a lift to access the first floor. Further corridors must be traversed before arriving. Women interviewed perceive this path as long and disorienting, despite the presence of signage. During the day, the woman in labor takes a

shorter and less disorienting path, although it is indirect. The access is via the maternity reception which is located on the ground floor. It is then necessary to take a lift and cross corridor to reach the maternity ward. Noha, a mother who shared her experience, highlighted the importance of spaces that guide rather than disorient.

> And then we entered; I didn't realize it was visible… it was a real 'maze'… We went up the stairs. There are lifts, which I didn't see… I was already very tired. We crossed corridors without chairs and doors… There were several doors opening, and I couldn't understand the spatial code. (Noha)

The CMNT case study revealed significant orientation issues based on in-site observations and feedback from both mothers and medical staff. From the main entrance at the lower garden level, we noted the absence of a clearly identifiable reception area and insufficient signage. Spatial disorientation can lead to stress and panic, especially in medical emergencies. Many women describe the maternity ward as maze-like, underscoring the need for improved wayfinding and environmental clarity.

> I don't know where to enter or exit; it's like a maze. The architecture is unclear, and the space is disorienting. (Marwa at CMNT)

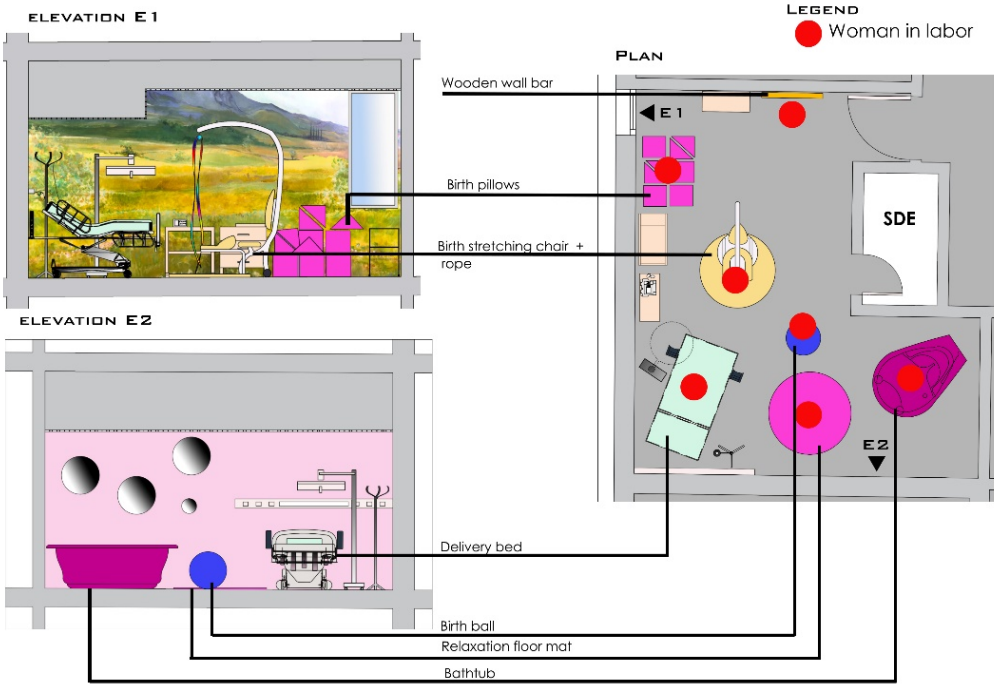
Situation of Disability: "Immobility"

All the components of the space (morphology, layout, features...) define the woman in labor's way of using it and her birth experience. We have identified typical situations of disability, such as immobility, which can significantly impact this sensitive experience. In Tunis, the woman in labor does not place importance on the kinesthetic ambiance. This stems from a technocratic model of care. It is the only approach to childbirth currently adopted in Tunisia. This model relies exclusively on the gynecological birthing position. Consequently, the birth space is static, monotonous and constrained. The design of this space limits women's ability to move and engage during labor.

This rigidity contrasts with the holistic model of birth. This model integrates diverse postures to enhance the labor experience. Posture devices such as pillows, cushions, a birth ball, a carpet, a birth rope, and a bathtub stimulate the haptic dimension (movement and touch) for the woman in labor. This brings us to the concept of spatial affordance (Gibson, 1979). Space is not merely a passive support for actions but rather a stimulator. It shapes the woman in labor 's use and behavior through affordances it offers. By integrating diverse postural options, the birth space can shift from a restrictive setting to one that actively supports the physiological and emotional needs of woman in labor.

The figure below illustrated the various postures devices offered by the natural birth room at the maternity ward at GHM Grenoble (Figure 4). This room is designed to be fluid. It has various posture devices such as the birth stretching chair, rope, birth pillows, birth ball, relaxation floor mat, wooden wall bar, bathtub and delivery bed. Several labor and birth postures are available to woman in labor. They stimulate her senses. Her body has more freedom to move. She has the possibility of touching, pushing, leaning on... They help to ease her pain and her state of stress during her birth experience (Robert, 2014).

Figure 4
Spatial Affordances for Childbirth Postures in GHM Natural Birth Room



The majority of women respondents have mentioned the importance of posture devices to help them ease their pain during the labor phase.

> I dreamed about having a natural birth.... I discovered the natural birth room at the GHM Grenoble. According to my experience, it was great. Devices, they were pain-relieving. For me, it's a dream come true to try the bathtub... (Julie at the GHM)

> ... It was nice to give birth at the birth center. There is birth ball which I didn't have at home... I arrived in the room, I was already having strong contractions, I held onto the edge of the wall, against the window... I was standing. Then, I got down on all fours, leaning on the ball, my knees on the mattress on the floor. (Eva at "La Maison")

Incorporating the kinesthetic ambiance into the birth spaces' design process means reflecting on freedom of movement, bodily autonomy and the fluidity of postures (Lepori, 2008; Setola et al., 2019). In her research, architect Bianca discusses the importance for a woman to be free to move and to be able to control her environment throughout the labor phase (Lepori, 2008).

Situation of Disability: "The Need for a Shared Space"

Childbirth is a social event before it is a spatial one (Davis-Floyd, 2001; Joyce, 2018; Lepori, 2008). It is a joyful event that concerns not only the woman but also her partner and their families. It is shared between all these actors. it generates emotions. This dimension is important for the women during childbirth experience. For this reason, the birth space is considered a social space. It supports social, spatial, and ambiantal sharing between the various users: the woman in labor, medical team, her family, and other women (Setola et al., 2019). The configuration of the space, its layout, its capacity, its arrangement, the isolation

between rooms… these parameters play a key role in determining the relational ambiance and the ways in which space is shared during childbirth.

Women highlight the importance of having a social and communal area. They require an area beyond their maternity rooms where they can eat, interact, and care for their babies. Noha notes the lack of such spaces in the CHU maternity ward. Due to the small size of the maternity rooms, such spaces are essential.

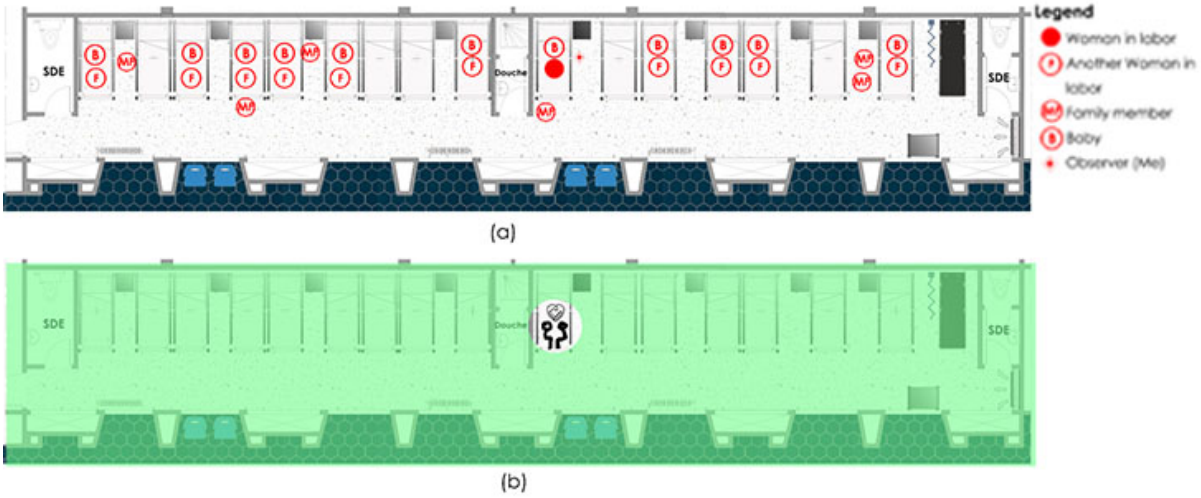
> … What I really missed was a collective space. It feels like entering cells, and I feel very alone… It's not easy, I just stay in my room, alone… It might have been a good opportunity, if there was a shared space where we could at least step out… a real place where we can meet, share experiences, sometimes even eat together, walk around with our babies… (Noha at CHU Grenoble)

In the case of Tunis, any presence other than the medical team is prohibited. It is only during the postpartum phase that family visits are allowed, and only for two hours. During the labor phase, the woman in labor wanted to be accompanied to help her cope with the pain and feel reassured. As observers, our presence was passive. Although it was welcomed, it had a positive impact on the women's emotional experience. They were seeking human presence. During the postpartum phase, shared ambiance and emotional support is encouraged.

The maternity room is a shared space with two interconnected parts separated by a shower (Figure 5). It is an open space designed for better visibility and monitoring. This arrangement increases capacity and encourages solidarity among mothers. The room opens onto a corridor that serves as a buffer space, filtering light and sounds from the outside. In this room, mothers help each other and share food. They also explain to first-time mothers how to hold the baby and how to breastfeed. The shared ambiance takes on its full significance in view of the spatial dimension, which is considered poor in terms of quality.

Figure 5

Diagram of Shared Ambiance Situation: (a) Position of Users/(B) Arrival of Husband



From the data collected and analyzed, we identified significant moments by focusing on the already captured EDA. These moments are related to electrodermal reactions (REDs). These are physiological peaks detected at the onset of a sound, light, or other stimuli, and fade once the stimulus stops. The REDs correlating with the observations and interviews allowed us to

detect the ambiantal situations experienced: stressful or significant. To illustrate, we chose a typical situation of shared ambiance during family visits (Figure 5 and 6). At the time of RED, the sound level in the room exceeded 75 dB. Our observations indicate that the RED coincided with the arrival of visitors. The maternity room was crowded, and the noise level was well above the standard threshold. The EDA of the woman respondent showed a sudden increase in amplitude (Figure 6). According to both observation and interview, this RED coincided with the arrival of her husband and reflected her joy. Karima held the baby towards him, saying:

> Look, your daddy is here!!! This is my husband, Ichraf... (Karima at CMNT)

It was observed that the woman's sense of vulnerability was negatively affected by a crowded sonic ambiance but improved by the presence of others (her family) and the festive atmosphere.

Figure 6
Graph of Karima's EDA

In contrast to the hospital space, "La Maison" offers spaces that foster sociability and conviviality. The presence of a shared space, such as a louange or tisanerie, allows women to share moments and move freely, like at home. It also enables them to engage in routine domestic activities, such as cooking and eating together…

> ...A very pleasant space... I feel like at home... and human presence: It's essential reassuring. It reassures, comforts, and inspires confidence... my husband can go cook in a kitchen at our disposal. This place, like home, is just fantastic... (Perrine at "La Maison")

A space for sociability, such as a living room, kitchen or dining area, encourages interaction and sharing among women. It is a kind of escape for them. The architectural design of birth centre helps reinforce familiarity and collective experience among its users.

Conclusion

In this study, it was possible to observe that the birth space, through its ambiance and affordances, plays a crucial role in mitigating certain disabling situations. These situations, described as temporary, are closely linked to the physical and psychological conditions of the woman in labor during childbirth. They highlight the inherent vulnerability and the alteration of perception during this event. This illustrates the importance of designing spaces that support both physical and emotional needs.

This research situates ambiance at the crossroads of physical and emotional dimensions. It highlights its complexity. This research paves the way for an ambiance's project-based approach. This approach aims to contribute to the architectural design of new hospital structures dedicated to childbirth. It proposes guidelines and corrective tools that must remain flexible and context-sensitive. They are rooted in lived experience rather than in universal application.

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We dedicate this work to the memory of the late Professor Jean-Pierre Péneau, who led this research and believed in us.

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Unpacking the Lived Experience of Cyberloafing Among Generation Z: An Interpretative Phenomenological Analysis of Perceptions, Meanings, and Ethical Dilemmas

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Abstract

Cyberloafing has become a phenomenon of internet abuse in the workplace that has a detrimental impact if not taken seriously. Academics are trying to research various causes of this destructive behavior, such as cyberloafing, which is increasingly occurring. However, only a little literature reveals the perception, meaning, and ethical problems of cyberloafing in the workplace. This research explores the perception of cyberloafing among Generation Z in the public sector. The study investigates the fundamental reasons and their manifestations in the work setting, utilizing a qualitative methodology incorporating interpretative phenomenological analysis. The Straus Corbin qualitative research approach was used to understand, examine, analyze, and interpret respondents' views. We conducted nine semi-structured interviews; all respondents had more than 3 years of work experience and an average age of 25. The findings indicate that employees engage in cyberloafing due to work system, perceived cyberloafing, and work-related stress. Generation Z, who grew up on the internet as long as they lived, might have different perceptions about cyberloafing, whether it is ethical or unethical. The current study contributes to literature by focusing on the perception of cyberloafing among Generation Z.

Keyword: cyberloafing, work deviance, Generation Z, public sector

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Introduction

Companies around the world gradually increased their investment in Internet resources in the early 2000s, and as technology became more pervasive in business enterprises, so did the potential for abuse. Then this problem attracted the attention of academics (Wu, 2020). Cyberloafing refers to the behavior of employees using the internet for personal purposes during work hours, such as browsing social media, shopping, or engaging in other non-work-related online activities (Wu, 2020). In a time when digital technology and work are increasingly integrated in the workplace, cyberloafing is becoming more common, as employees often have easy access to the internet through personal computers and mobile devices. Based on research by (Jandaghi et al., 2015), apart from the loss of productivity, extensive use of social media by employees also results in increased loss of confidential information, defamation and misinformation.

Generation Z grew up in a technology-friendly and tech-savvy environment (Park & Chun, 2020). This new generation comprises more than a third of the world's population and outnumbers Millennials (https://www.bloomberg.com). Generation Z is considered a digital generation because they are active and use digital content as native speakers (Wiedmer, 2015).

Based on the background, the questions arise, how do members of Generation Z perceive and make sense of their experiences with cyberloafing, including the ethical dilemmas they encounter in the workplace?

Literature Review

Cyberloafing in the Workplace

Lim and Teo (2024) initially conceptualized cyberloafing as employees' voluntary use of their organization's internet access for non-work purposes during work hours. Another definition of cyberloafing is the personal use of some information and communication technology during work hours that are not related to a task (Pindek et al., 2018). Cyberloafing behavior is generally considered a detrimental deviation because it has nothing to do with work (Khansa, 2017). Cyberloafing is not just an act of wasting time at work by doing light "things" but also considered as technology misuse at the workplace.

The mechanism or behavior of cyberloafing is shown in various forms, such as for example for minor cyberloafing behavior employees who have access to computers also present the temptation to engage in deviant behavior at work, including browsing the internet, connecting with others through social media, or watching videos (Hu et al., 2023). Lighter forms e.g. checking email or reading news (Varol & Yıldırım, 2019), online shopping (Chavan et al., 2022). In the heavier or major form of cyberloafing, examples can be given for example aggressive behavior of co-workers, property irregularities: behavior that harms company assets such as stealing, sabotaging, and accepting bribes (Robinson & Bennett, 1995).

Generation Z and Technology

Generation Z grew up in a technology-friendly and tech-savvy environment (Park & Chun, 2020). This new generation covers more than a third of the world's population and exceeds the number of Millennials (Miller & Lu, 2018). Generation Z has different characteristics

compared to the previous generation. One of the distinguishing characteristics of Generation Z from other generations is that Generation Z prefers non-face-to-face interactions, so the impact of excessive exposure to technology can make them anti-social or unstable and cause mental health disorders due to their weak concentration ability (Chicca & Shellenbarger, 2018) and are more individualistic (Dangmei & Singh, 2016). In terms of mobile devices, Generation Z has similarities with Generation Y/Millennials who are always connected to the internet and social media, but Generation Z is more multi-tasking.

Methodology

This study uses a qualitative method with the Interpretative Phenomenological Analysis (IPA) approach, which emphasizes inductive methods that are able to explore the views and experiences of participants (Erzberger, 2001). The reason for choosing a qualitative method is also based on the fact that qualitative research allows researchers to obtain rich data on complex human experiences. This study aims to explore the experience of employees related to cyberloafing, so that to answer this goal, a phenomenological approach is used, because phenomenological research seeks to understand the participants' life experiences (Moustakas, 1994).

Data Collection

This study used purposive sampling to select participants and continue the participant interviews until data saturation occurred. Purposive sampling involves deliberate sampling of participants who meet the criteria set by the researcher (Koning & Waistell, 2012). Wawancara merupakan elemen penting dari metode pengumpulan data yang digunakan dalam penyelidikan kualitatif dan lebih umum dalam ilmu-ilmu sosial (Patton, 2002). The focus of phenomenological interviews is centered on the participants' experiences and the meanings that are perceived to come from those experiences (Liberman et al., 2011).

Data Analysis

Data analysis in science is generally inductive, namely from the bottom up, with code generated from raw data (MacLeod, A. 2019). The main objective of the analysis is to provide a full appreciation of each participant's experience, in accordance with the ideographic commitment of the IPA (Pietkiewicz & Smith, 2014). In interpretative phenomenological analysis (IPA), the raw data processing process goes through an interpretative process, meaning that raw data/transcripts will be interpreted directly by the researcher. Analysis in science is the process of interpreting personal experience by running epochē (Kahija, YF La, 2017). Table 1 shows the profile of the research respondents.

Table 1
Respondents Profile

Empirical Material respondent Number (EMI)	Gender	Experience	Designation
EMI1	Female	3 years	accountant
EMI2	Female	4 years	Staff
EMI3	Female	3 years	Staff
EMI4	Male	3 years	Staff
EMI5	Male	3 years	Staff
EMI6	Female	3 years	Staff
EMI7	Female	4 years	Staff
EMI8	Male	4 years	Staff
EMI9	Female	3 years	accountant

Results and Discussion

The research findings from the interview show that the antecedents of cyberloafing behavior are work stress, perception and work system. The first theme is the work system derived from work from office, work from home, and tools for work. Generation Z, who works as civil servants that often come home late, may experience cyberloafing while working in the office, especially if they spend more time on non-productive digital activities. The use of laptops as a tool for work shows that Generation Z has a need to move from place to work while staying connected to important data and information. This shows a work approach that focuses on equality and efficiency, where employees use their own devices to overcome the limitations of office infrastructure.

Work System

In the context of a work system where there is a work-from-home dimension and work-from-office, tools can provide access to cyberloafing behavior. The phenomenon can be explained as follows. Generation Z civil servants who often come home late when working from the office may experience *cyberloafing* while working, especially if they spend more time on non-productive digital activities. In addition, the discipline of ASN in terms of arrival to the office also shows a varied pattern.

Generation Z uses gadgets for work because they are always connected to the internet and up to date with information in online news, as conveyed by the following participant.

> Mobile phones, laptop, computer. If the computer stays, if the laptop is usually to move around in this room because there is no computer, I use a personal laptop and then the data will be transferred to that computer. (EMI7)

> Computers, desktops, for example, there are also laptops, wifi. (EMI5)

> Work is often taken home. For example, I have a deadline that allows me to take work home for 3 days a week; if I don't finish my tasks during the day, I must complete them at home. (EMI9)

> Suppose the deadline must be a maximum of midnight at 00.00; it will be overtime until night. But if the deadline is still 2-3 days away, there is also no overtime, so if it is too late, that day must be completed as well; it must be done overtime. (EMI8)

Employees who work from home have higher job satisfaction, and work-life balance. Generation Z civil servants who often come home late when working from the office may experience *cyberloafing* while working in the office, especially if they spend more time on non-productive digital activities. In addition, the discipline of ASN in terms of arrival to the office also shows a varied pattern.

Perceptions of Cyberloafing

For Generation Z who are very dependent on technology and gadgets, the internet provides convenience but also like two opposite sides when used while working for personal convenience. However, there are two views related to this perception, the first is as natural or legitimate and the second is unnatural and as ethical or unethical behavior (Alharthi et al., 2021; Anandarajan, 2002). For Generation Z who have a free and more individualistic character, the perception of cyberloafing shows that this behavior is acceptable when it is not ethically violating organizational rules.

> Sometimes during work hours, we open social media on the computer, because if we open it on our cellphone during break time, we have to just adjust the time. (EMI1)

> If others like checking WhatsApp from family or just listening to music from YouTube, it's still ok. (EMI2)

> If it is considered normal, it is just like looking for information. (EMI9)

Based on the quote, employees gave opinions regarding their experience of cyberloafing, which was still at an ethical level, meaning that it was still within reasonable limits so as not to interfere with their work. The behavior pattern that emerges is a feeling of indifference towards colleagues who *cyberloaf*, because they behave the same way when they do *cyberloafing.* This mutual understanding creates a sense of camaraderie among employees, as they acknowledge that everyone occasionally engages in such behavior.

In addition to ethical perception, cyberloafing is also considered unethical when there is detrimental or interfering with personal and group performance.

> In my opinion, in the end, it is unnatural to play games because it means leaving work, not something that is just refreshing. Playing games is like how long it takes to be fixated. Maybe if the mobile legend must match with his friends, it can't be simply abandoned. That's what I think is at the limit of unnatural, right? If others may be*, like,* checking WhatsApp from family or just listening to music from YouTube, it's still natural to still be. (EMI8)

> Inattention may be like there is a pile of work, but for example, like watching or opening things that are not important, keep when asked which work has not been completed, not yet. Meanwhile, if our work must be related to other people. The longer we work, the more other people will be delayed. (EMI3)

> In our office, the internet used to be blocked because it was often used for You tube, or playing games, in my opinion this is unethical so that the internet is not used for unnatural things. (EMI4)

Generation Z, who are more connected to the internet daily, considers playing games at work unnatural because it can distract from work. They distinguish between activities that are simply refreshing and those that really disrupt work focus. They realize that cyberloafing can cause delays in completing work, which impacts other coworkers. It shows an awareness of team responsibility. This sense of accountability reflects their understanding of workplace dynamics and the importance of maintaining productivity. As a result, Generation Z often seeks a balance between enjoying moments of leisure and fulfilling their professional obligations effectively.

Conclusion

Generation Z engages in more cyberloafing while working from the office because they participate in personal learning activities, such as learning about investments online during work hours. In addition, cyberloafing behavior is shown by employees in the form of discovering activities such as opening social media, watching streaming videos, listening to digital music, browsing on the internet, playing online games, replying to messages on instant messaging apps, listening to podcasts, and opening e-commerce. Cyberloafing will continue to exist in every generation because they are always connected to the internet, even at work. Organizations should consider the positive impacts *of cyberloafing* in addition to the negative impacts.

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Understanding Local Budget Actors Behavior: Lessons Learned From Disaster Budgeting in Indonesia

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Abstract

This study examines the phenomenon of natural disaster budgeting by local budget actors in Regional Disaster Management Agencies (RDMA). Specifically, it addresses two key aspects: first, how local budget actors allocate funds for natural disasters in their regions, and second, how their perceptions influence their behavior in natural disaster budgeting. Employing a phenomenological approach with an interpretive perspective, this study describes how local budget actors allocate natural disaster budget. In-depth interviews were conducted with 15 local budget actors, ensuring reliability, validity, and credibility through adherence to the principle of saturation. The findings reveal that local budget actors tend to allocate budgets based on their perceptions. Positive perceptions of natural disasters lead to proactive behavior, whereas negative perceptions result in reactive behavior. This study highlights its originality by discussing the unique variations in the behavior of local budget actors in allocating natural disaster budgets based on their individual perceptions.

Keywords: dynamics, inconsistency, disaster, expenditure

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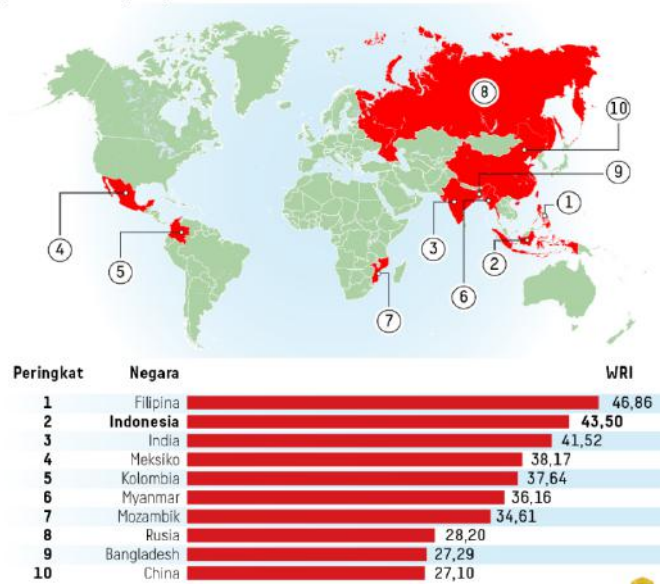
Introduction

Indonesia is known not only for its rich natural resources (Sabir & Phil, 2016) but also for its high level of vulnerability to natural disasters (Astutik & Apriliana, 2022; Herqutanto et al., 2022). This is due to Indonesia's location in a subduction zone and its position within the Ring of Fire, a zone of active tectonic plate boundaries that triggers high volcanic and seismic activity (Damayanti et al., 2019). These conditions make volcanic eruptions and earthquakes frequent occurrences, causing significant damage and loss of life (Bachri et al., 2024; Meral et al., 2024; Purba et al., 2022). History records major disasters such as the 2006 Yogyakarta earthquake, which claimed 5,716 lives and caused US$3.1 billion in damages (Amri et al., 2024), and the 2010 Mount Merapi eruption, which resulted in 367 deaths and damages up to US$781 million (Hermawan et al., 2024). The World Risk Report 2023 ranks Indonesia as the second-highest disaster-prone country globally, with a risk index of 43.50.

Figure 1
Countries Most Prone to Disasters in the World



Source: World Risk Report (2023)

The high risk of natural disasters in Indonesia necessitates a planned, integrated, coordinated, and comprehensive disaster management system (Andreastuti et al., 2023; Fitriani et al., 2021), as stipulated in Undang-Undang Republik Indonesia Nomor 24 Tahun 2007 tentang Penanggulangan bencana. This law emphasizes that the responsibility for disaster management lies with the central and local governments, with support from stakeholders. To support the effectiveness of disaster management, adequate budgetary support is required (Shalih & Koestoer, 2019), with an ideal allocation of at least 1% of the total local government budget, as recommended by UNISDR 2014. However, field studies indicate that coordination, attention, and commitment from the government in prioritising disaster management as part of regional development remain weak (Hartati et al., 2024).

Government awareness and perception of disaster risk influence disaster management policies and implementation. Positive perceptions and high awareness encourage proactive behavior, such as allocating an adequate budget for mitigation and preparedness (Aitsi-Selmi et al., 2016; AlQahtany & Abubakar, 2020). Conversely, negative perceptions and low awareness lead to reactive policies that focus on emergency response without proper planning

(Shaw et al., 2015). The paradigm shift from responsive to preventive measures is reflected in mitigation efforts, which are now the primary focus of disaster management (Napirah et al., 2023; Taufan Maulana & Andriansyah, 2024). The success of disaster management systems also depends on the government's commitment to prioritising disaster risk reduction in regional development (Hartati et al., 2024) and providing adequate budgetary support (Shalih & Koestoer, 2019). UNISDR (2014) recommends that disaster management budgets should be allocated at least 1% of the total regional government budget. Additionally, the attitudes of budget actors at the local level play a crucial role in determining the magnitude of disaster funding allocations. Supportive attitudes and high levels of attention facilitate more effective budget allocations, whereas weak attitudes and low priorities can hinder the effectiveness of disaster response (Darmin et al., 2024).

In practice, the RDMA, as the spearhead of disaster management in the region, faces various challenges, ranging from overlapping regulations (Gailmard & Patty, 2019), slow bureaucracy (Mardalaila et al., 2022), weak political support (Apryana et al., 2020; Hartati et al., 2024), to limited resources (Handoyo et al., 2024). The vertical and horizontal synergy between RDMAs, as well as capacity building and collaboration among various actors, are crucial for enhancing the effectiveness of disaster management (Putra & Matsuyuki, 2019; Sopha, 2022).

Literature Review

Natural Disaster Management

Disaster management in Indonesia is a form of community protection from disaster risks (Dewantoro, 2021) and is regulated by Undang-Undang Nomor 24 Tahun 2007. This law emphasises the responsibilities of central and regional governments in implementing disaster management, covering the pre-disaster stage (mitigation, preparedness, and prevention), the disaster stage (emergency response), and the post-disaster stage (rehabilitation and reconstruction). The stages of disaster management are cyclical, with a proactive approach in the pre-disaster phase—through risk reduction investments and a national resilience vision—and a reactive approach during the emergency response phase for rescue and protection (Undang-Undang Nomor 24 Tahun 2007).

Disaster Budgeting

Disaster budgeting is a strategic process of allocating funds to support every stage of disaster management. In general, public budgeting is a written, systematic, and financially measurable statement of estimated performance to be achieved (Mardiasmo, 2018). Budgeting in public organizations emphasizes political processes and accountability (Halim & Kusufi, 2014), unlike in the private sector. In the context of disasters, budgeting requires high flexibility and rapid adjustment mechanisms due to the uncertainty of risks (Liu et al., 2022). Therefore, aspects such as estimation, reallocation mechanisms, and contingency funds are key (Mardiasmo, 2009).

Disaster Budgeting Actors

Disaster budgeting in Indonesia is carried out by central actors, namely National Disaster Management Agency (NDMA) and local actors (RDMA) in accordance with their primary duties and functions (Peraturan Pemerintah Nomor 22 Tahun 2008). NDMA is responsible for

coordinating and managing disaster management at the national level, while RDMA acts as the direct implementer in the regions, tailored to local characteristics (Peraturan Pemerintah Nomor 21 Tahun 2008). Both entities carry out coordination, command, and execution functions to ensure that disaster response efforts are well-directed, integrated, and comprehensive. However, budgeting at the local level often faces challenges, such as overlapping regulations, slow bureaucracy, and insufficient government commitment (Hartati et al., 2024).

Perception

Perception is an experience produced by the senses of sight, hearing, and smell (Gibson et al., 2012). In this study, perception can be understood as one of the important psychological aspects that enable humans to respond to the presence of various aspects and phenomena around them. According to Walgito (2004), perception is a cognitive process that begins with a sensory process, namely stimuli received by the sensory organs. Perception sometimes differs from reality.

According to Sunaryo (2004), the conditions for perception to occur are as follows.

1. The presence of an object to be perceived.
2. The presence of attention, which is the first step in preparing for perception.
3. The presence of sensory organs/receptors, which are the tools for receiving stimuli.
4. Sensory nerves, which are the tools for transmitting stimuli to the brain, which then act as the tool for producing a response.

According to Toha (2003), the following factors influence a person's perception.

1. Internal Factors
   Feelings, attitudes, individual personality, prejudices, desires or expectations, attention (focus), learning processes, physical condition, mental disorders, values, interests, and motivation.
2. External Factors
   Family background, information obtained, knowledge and needs of the surrounding environment, intensity, size, contrast, repetition of movement, newness or familiarity of an object.

Toha (2003) also explains the process of perception formation based on the following stages.

1. Stimulus
   This stage is the first step in which individuals receive stimuli from both the external and internal environments. Stimuli can be information, events, or situations that affect a person's senses, such as sounds, light, or certain emotions. These stimuli become the basis for a person to begin to pay attention to what is happening around them and lead to the perception process.
2. Registration
   Registration is the process by which stimuli received by the senses are processed and stored in the nervous system. At this stage, sensory organs such as the eyes, ears, and skin play a crucial role in capturing stimuli and transmitting them to the brain. This process involves initial filtering of information that is considered relevant so that only certain stimuli are processed further.
3. Interpretation
   Interpretation is the process of giving meaning to stimuli that have been registered. At this stage, individuals use experience, knowledge, and context to understand or

interpret stimuli. Interpretation can vary between individuals because subjective factors, such as culture, values, and emotions, influence the way it is perceived. The result of this stage is the formation of different perceptions for each individual.

Proactive and Reactive Behavior

Based on behavioral science, individual behavior is a combination of several factors, such as perception, motivation, emotions, and learning (Gibson et al., 2012). In the face of various challenges, one of which is natural disasters, individual behavior can be classified into two main approaches: proactive and reactive behavior. Both approaches play a crucial role in determining how individuals, communities, or organisations respond to a situation, whether by taking preventive measures before an event occurs or by responding after the event has occurred. Understanding these two types of behavior is key to designing effective and sustainable disaster management systems.

Proactive and reactive behavior are two different approaches to responding to situations or events. Proactive behavior is an action initiated voluntarily by individuals or groups before an event occurs to prevent or mitigate adverse impacts. In contrast, reactive behavior is a response that arises after an event occurs, often as a direct reaction to the situation at hand. In the context of natural disasters, proactive behavior can be understood as an approach that focuses more on the prevention and mitigation of risks before a disaster occurs rather than simply responding to the disaster's impact (Wei et al., 2024). This approach aims to reduce vulnerability and improve community preparedness.

Meanwhile, reactive behavior in the context of disaster management policy refers to responses or actions taken after a disaster occurs (Choudhury & Haque, 2024). This behavior is often oriented toward providing immediate responses to disaster events, such as emergency assistance, rehabilitation, or recovery from damage that has occurred. Although reactive responses are crucial for managing disasters, this approach is often insufficient to mitigate the long-term effects of disasters. Research by (Utomo & Minza, 2018) examined the helping behavior of spontaneous volunteers after natural disasters, which is an example of reactive behavior in emergencies.

According to (Noy et al., 2022), proactive behavior refers to preparatory and risk management measures taken before a disaster occurs. Reactive behavior, on the other hand, refers to immediate responses to the impacts of a disaster after it has occurred. Furthermore, according to (Macaskill & Guthrie, 2018), reactive behavior refers to decision-making and resource allocation approaches that only respond to damage or immediate needs after a disaster has occurred. This behavior is often seen in infrastructure reconstruction budgeting. Decisions are based on physical damage that has already occurred without considering long-term needs or opportunities to improve infrastructure resilience.

These two approaches complement each other in disaster management. However, an emphasis on proactive behavior through mitigation and preparedness can significantly reduce losses and increase community resilience to natural disasters. Therefore, integration between proactive and reactive strategies is essential in comprehensive disaster management efforts.

Methodology

Research Approach

This study uses a qualitative phenomenological approach (Kusumawanti & Arawindha, 2018) to gain an in-depth understanding of the attitudes and behaviors of disaster budget actors in the region. The phenomenological approach was chosen because it is capable of exploring the subjective experiences of actors and how they interpret the decision-making process in disaster budgeting, particularly in areas with high risk of volcanic eruptions and earthquakes on the island of Java.

Data Collection and Sampling Techniques

To obtain rich and in-depth data, this study involved semi-structured in-depth interviews with 15 local budget actors in RDMA. Sampling was conducted using snowball sampling to identify relevant informants until data saturation was achieved. This saturation principle was applied to ensure that the themes obtained fully represent the perspectives of the actors and that no significant new information is present.

Interview Procedure and Data Analysis

The interview protocol was developed concerning previous literature and designed to facilitate the actors' real-life narratives. The interviews were conducted face-to-face in a semi-structured format, recorded with the participant's consent, and analysed inductively using phenomenological principles. This interpretive phenomenological approach focuses on understanding the meaning behind the subjective experiences (Seidman, 2013) of local budget actors. This approach not only examines what actors do but also why they do it and how they interpret their actions within the context of disaster budgeting decision-making.

Focus on Meaning Interpretation

By emphasising subjective experiences, this process aims to capture reality as directly experienced by actors, as well as how they construct logic and justification in budgeting practices, particularly when facing uncertainty and pressure in preparing budgets for disaster scenarios.

Results and Discussion

The Construction of Negative Perceptions and Their Impact on the Reactive Behavior of RDMA Officers

Negative perceptions that develop within the RDMA environment have profound implications for the behavior patterns of its officers, particularly when dealing with disaster situations.

When these negative perceptions grow systematically, influenced by both internal and external factors, the response to disasters tends to be reactive rather than preventive. In this context, not only is disaster preparedness disrupted, but also the effectiveness of response once a disaster has occurred. This section outlines the various sources of these negative

perceptions and how they hinder institutional performance in carrying out strategic disaster management functions.

Internally, negative perceptions among RDMA employees do not arise out of nowhere. One of the primary sources is the prevailing view that individuals assigned to the RDMA are low-performing employees. This stigma creates doubt among employees about the importance of demonstrating maximum performance: When they have been labelled as low-quality human resources, an implicit question arises—"why should I perform well?" This psychologically reduces work motivation. Additionally, limited personnel and high workloads contribute to stress levels, causing RDMA employees to experience burnout. This is exacerbated by the absence of institutional recognition and minimal affirmation of the strategic value of their work. In situations like this, a sense of belonging to the institution wanes, and commitment to public service becomes less compelling.

The lack of policy support for RDMA employees also reinforces these negative perceptions. When officers lack structural support, apathy and even cynicism can easily develop. This is closely related to the weak political will of local and central governments to strengthen the institutional capacity of RDMA. One concrete example of this weak external support is the lack of RDMA involvement in the budgeting process. This institution is often used solely as a technical implementer without participating in the design of budget policies. This condition not only reflects structural inequality but also confirms that the broader government system has not fully recognized the urgency of the RDMA's role.

Furthermore, in practice, the funds that RDMA can use for disaster management tend to be small. They are heavily dependent on grants, for example, from the NDMA, as well as volunteers and community groups. Such dependence highlights the weak fiscal autonomy of RDMA while also creating a working environment that is limited and uncertain.

Regarding emergency budget management, there has been internal debate about the effectiveness of unexpected expenditures. Some officials believe that the small allocation of unexpected expenditures for disasters reflects a lack of commitment to them. In addition, the mechanism for submitting BTT is considered too bureaucratic and complicated. Complex reporting procedures add to the administrative burden and render this instrument unable to respond quickly and efficiently to field needs. Some employees consider the preparation of financial accountability reports for unexpected expenditure funds to be a major obstacle. This complexity is thought to stem from the low literacy of RDMA employees in understanding the reporting system and public financial regulations. A lack of knowledge about the procedures creates an excessive fear of administrative errors, especially with the threat of legal sanctions looming.

This situation creates a serious dilemma: the need to act quickly in an emergency situation versus the obligation to comply with bureaucratic procedures that are considered slow and burdensome. When the system prioritizes administrative accountability over the effectiveness of responses, the choices made by officials tend to be conservative and defensive. In many cases, concrete actions on the ground are delayed or even not carried out at all due to concerns about potential legal repercussions. As a result, gaps in disaster response tend to be less optimal, and risks to public safety increase significantly.

This reactive attitude is essentially a manifestation of an unadaptive bureaucratic structure. RDMA officials are not given sufficient discretion to make quick decisions in emergency

situations. When policies are overly focused on administrative compliance, while on-the-ground needs demand speed and accuracy, a pattern of behavior emerges that tends to avoid responsibility and rely on external parties such as volunteers. In practice, volunteers often become the most active actors on the ground, while RDMA officials merely serve as administrative symbols.

Ironically, when volunteers act quickly, they face difficulties in reporting because there is no adequate accountability system, such as transaction documentation or purchase notes. This makes aid distribution impossible to audit properly, and ultimately, the government or NDMA tends to encourage donors to give aid directly to victims—a move that also reflects a lack of trust in the official distribution system. Without a strong institutional system and proportional budgetary support, the presence of volunteers will not be able to cover the structural weaknesses of state institutions.

In this situation, RDMA officers become more oriented towards avoiding administrative risks than towards urgent humanitarian needs. A bureaucratic culture that punishes mistakes more harshly than it rewards initiative encourages officers to be passive. In practice, this results in the neglect of disaster risks that could have been mitigated from the outset. When mitigation is not a priority, and only emergency response interventions are carried out, disaster management becomes very partial and patchy.

The situation is exacerbated by unclear authority between agencies and overlapping tasks, which cause confusion in coordination in the field. When responsibilities are not clearly divided, decision-making becomes slow, and each institution tends to pass the buck. Ultimately, what is seen is pseudo-performance: it appears that the RDMA is present and active, but the majority of the response is actually carried out by volunteers. Without a robust institutional system and proportional budgetary support, the presence of volunteers will not be able to sustainably address the structural weaknesses of the government.

This deep-rooted negative perception ultimately gives rise to reactive patterns of behavior in disaster management. The response of RDMA officers is no longer based on well-thought-out and anticipatory plans but rather on reactions to emergency situations as they arise. The root of this problem is very complex, involving policy aspects, weak institutional structures, and a bureaucratic culture that has not adapted to the principles of preparedness. One of the main issues is the absence of disaster budgeting priorities in the state financial structure, both at the national (state budget) and regional (regional budget) levels. When budgeting is not a priority, flexibility in responding to emergency situations is lost. As a result, resource allocation is inadequate, mitigation is not carried out effectively, and the performance of officers declines.

From a public policy perspective, this reactive behavior indicates systemic failure. RDMA actions are often emergency responses without prior comprehensive planning. Handling is partial, does not address the root causes, and tends to rely on short-term solutions. The main cause lies in budgeting policies that do not prioritize disasters in the Regional Revenue and Expenditure Budget. This situation has created a rigid budget structure that is inflexible to the dynamics of disasters, resulting in officers not having adequate room to manoeuvre. Populist budgetary politics and decisions that depend on the orientation of regional leaders have exacerbated the situation. Ultimately, interventions are temporary and do not address the root causes. Mitigation is neglected, preparedness is weakened, and post-disaster recovery is poorly managed.

Overall, reactive behavior in disaster management cannot be separated from the accumulation of complex structural problems: weak budgeting systems, low institutional literacy, unclear authority, and the absence of visionary and mitigation-oriented leadership. Without comprehensive reforms to the bureaucratic culture and institutional architecture of disaster management, this reactive behavior will continue to be the dominant pattern—sacrificing the effectiveness of interventions and eroding public trust in the state's ability to protect its citizens from disaster risks.

Between Dedication and Structural Limits: Considering the Orientation of Service in the Performance of RDMA Officers

Amidst bureaucratic complexity and minimal institutional support, there are still RDMA officers who view their work as a form of service. This positive perception is not based on financial incentives but rather stems from the belief that their duties are a moral calling to protect the community in times of emergency. Within this framework, the orientation toward service creates a deeper meaning for their duties. It is not merely technical implementation but rather a humanitarian dedication that is inherent to their professional identity.

However, this orientation toward service does not automatically negate previous findings regarding negative perceptions and reactive behavior. The apparent contradictions can be explained by distinguishing between individual intentions and structural limitations. Many RDMA officers are morally committed, but a minimal and inflexible budgeting system limits their room for maneuver. In many cases, they can only take active action once a disaster has occurred, not during the mitigation or pre-disaster stages. This is not merely a reflection of weak dedication but rather an objective condition where available budgets are limited and do not fully support preventive efforts.

The dedication of these officers is reflected in various concrete actions. They continue to carry out their duties even without overtime pay, travel allowances, or even outside official working hours. Their willingness to be on standby at night, outside office hours, without additional compensation, is clear evidence of their commitment to public safety. This attitude indicates that their motivation is not solely driven by material compensation, but by a strong internalisation of humanitarian values.

A commitment to service is also evident in their strong sense of social responsibility and duty. Officers who are sensitive to the suffering of the community will be motivated to act selflessly, regardless of limited facilities or budgets. They work with empathy and concern, aware that their work has a direct impact on the safety and lives of many people. These values form the moral foundation that keeps their spirit alive despite minimal structural support.

Such positive perceptions have the potential to encourage proactive behavior in disaster management. However, this will only develop optimally if supported by a strong support system. In this context, three important aspects can shape proactive behavior: community capacity building, cross-sector collaboration, and community network development.

The first aspect, community capacity building, is key to creating collective preparedness. Some RDMAs have initiated activities such as disaster simulations, disaster impact scenario planning, and logistics procurement before disasters occur. However, these achievements are still limited to areas with relatively adequate budget support. RDMAs with limited funds

often struggle to carry out similar activities optimally, despite their officers' intentions to do so.

The second aspect, cross-sectoral collaboration, is also uneven. Collaboration between RDMA and various stakeholders, including BMKG, social services, the media, and community organisations, can only take place in areas with a strong political commitment. In this study, only the RDMA of Sleman Regency demonstrated consistent and collaborative performance, which ultimately resulted in a higher budget than that of other RDMAs. Sleman is often used as a benchmark for its effective approach to cross-sector integration. This success cannot be separated from the local government's political will, which has made disaster management a priority. Without this commitment, RDMAs in other regions would struggle to replicate a similar model.

The third aspect, community networks, is a relatively more uniform element that has been successfully implemented in almost all regions. Amid the structural limitations of RDMA, community networks have become the frontline of disaster response. Organizations such as FPRB, HIMPSI, Banser, MDMC, and Baznas demonstrate high social capacity in evacuation, education, and aid distribution. They understand local conditions better, have flexibility in mobilizing resources, and are often more agile than RDMA itself. In this context, the role of the community is not merely complementary but rather a mainstay that fills the void left by the government's structural functions. As a result, the limited performance of the RDMA often appears superficial (pseudo-performance), which is driven by the contributions of the community on the ground.

This condition demonstrates that individual dedication is insufficient without support from a supportive system. Proactive behavior will only flourish if positive perceptions among officials are accompanied by a strong political will, adequate funding, and empowering regulations. Dedication without institutional support will only turn service into a silent spirit amid the clamour of bureaucratic procedures. Therefore, the challenge ahead is not merely to strengthen individual capacity but to build an institutional ecosystem that enables such dedication to translate into systemic, tangible actions.

Conclusion

This study reveals that the behaviour of local budget actors in disaster budgeting is strongly influenced by their individual perceptions and structural limitations within the RDMA. Positive perceptions encourage a sense of service and proactive actions, but limited funding, overlapping regulations, and rigid bureaucratic procedures often constrain these intentions, resulting in predominantly reactive behaviour. The findings highlight the need for strengthening institutional support systems, enhancing political commitment, and fostering cross-sector collaboration to promote proactive disaster management practices.

The implications of these findings suggest that policy reforms should focus on increasing budget flexibility, simplifying reporting procedures, and clarifying inter-agency responsibilities. Moreover, empowering RDMA officers through capacity building and community network strengthening can bridge the gap between dedication and institutional constraints.

This study is limited by its qualitative scope and focus on Java Island’s high-risk areas, which may not fully capture the diversity of local contexts in other Indonesian regions. Future

research should extend to comparative studies across different provinces and employ mixed methods to enrich understanding of the behavioural dynamics in disaster budgeting.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The authors declare that they have used generative AI and AI-assisted technologies, including language editing tools and AI-based paraphrasing support, to assist in refining the clarity and language quality of this manuscript. The final content and interpretation remain the responsibility of the authors.

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EEG-Based Assessment of Psychological Comfort in Urban Spaces: Impacts on Psychological and Cognitive States Using Virtual Reality Simulations

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Abstract

This study investigates the influence of urban design elements on psychological and cognitive states using neuroscience-based metrics. Participants were immersed in 360-degree VR simulations of diverse urban environments, featuring variations in scale, street width, green spaces, urban form, edges, "eyes on the street", lighting, colour, land use, accessibility, and building density. Neural responses from EEG (electroencephalogram) measurements were recorded using an Emotiv Insight EEG device, quantifying emotional states through frequency bands. Results revealed distinct impacts of urban design elements on psychological comfort and cognitive performance. Green spaces and accessible layouts promoted relaxation and engagement, while dense environments with limited lighting increased stress. Narrow streets with active edges enhanced safety perceptions, whereas poorly lit areas caused discomfort. Age and gender differences were observed in responses to various environments. The findings led to a comprehensive evaluation framework, providing urban planners with evidence-based insights for designing inclusive, productive, and well-being-oriented public spaces. This research highlights the potential of integrating neuroscience into urban design, particularly for diverse and rapidly urbanising regions like India. This study's innovative approach combines virtual reality technology with neuroscientific measurements to offer a nuanced understanding of how urban environments affect human experience. These insights can inform future urban planning strategies, potentially improving the quality of life of city dwellers by creating more psychologically supportive and cognitively stimulating urban spaces.

Keywords: neurourbanism, environmental psychology, psychological comfort, urban design, virtual reality simulations, EEG measurements

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Introduction

Urbanisation has emerged as one of the most transformative phenomena of the 21st century, reshaping not only physical landscapes but also the emotional and psychological realities of the people who inhabit them. As of recent estimates, over half of the world's population resides in urban areas, and this proportion is expected to continue rising (United Nations, 2022). While urban environments offer substantial economic and cultural advantages, they are also associated with a higher prevalence of stress-related mental health conditions such as depression and anxiety (Peen et al., 2010). The World Health Organization (2011) projects that by 2030, depression will become the leading contributor to the global disease burden.

The urban condition is shaped by a complex interplay of environmental factors, including noise, crowding, air pollution, social density, lack of green space, and visual stimuli overload (Gascon et al., 2016). These factors collectively contribute to an increased physiological stress response, further exacerbating mental health risks (Haddad et al., 2019). Despite these well-documented effects, the psychological impact of the built environment remains underexplored in mainstream urban planning discourse. Traditional planning tools and guidelines often overlook the nuanced ways in which spatial configurations and environmental cues affect mental states (Heath et al., 2017).

In this context, the emerging field of neurourbanism offers a critical lens through which to study how cities affect human cognition, emotion, and behavior (Adli et al., 2017). This study employs a novel methodology that combines virtual reality (VR) simulations with electroencephalography (EEG) to assess how different urban forms influence psychological comfort and cognitive response. Through this neuroscience-informed approach, the research aims to provide actionable insights for designing urban spaces that support mental well-being.

Background

The intersection of neuroscience and urban design has only recently gained traction, yet early findings are compelling. Research by Lederbogen et al. (2011) revealed that individuals raised in urban environments exhibit heightened activity in the amygdala—a brain region central to threat detection and emotional processing—and increased reactivity in the anterior cingulate cortex, which is responsible for regulating emotional responses. These results suggest that urban upbringing can lead to lasting changes in the way the brain processes stress.

Environmental psychology and biophilic design research have long supported the idea that exposure to natural environments and thoughtfully designed public spaces can have restorative effects on mental health. Kaplan and Kaplan's (1989) Attention Restoration Theory (ART) posits that natural environments help individuals recover from mental fatigue and restore directed attention by providing opportunities for soft fascination, a sense of being away, extension, and compatibility. Similarly, Ulrich's (1983) Stress Recovery Theory (SRT) proposes that exposure to natural settings can facilitate psychological and physiological recovery from stress by triggering automatic, positive emotional changes and reducing physiological arousal. These theories provide foundational frameworks for understanding how environmental qualities influence emotional regulation and attentional capacities.

However, much of the research underpinning these theories has relied on subjective assessments or observational methods. The current study seeks to build on this foundation by integrating objective biometric data, specifically through electroencephalography (EEG), to examine emotional and cognitive responses to urban environments with greater precision (Kim et al., 2022). By leveraging real-time neural data, this research aims to inform spatial planning and contribute to user-centric urban design, thereby bridging the gap between psychological theory and evidence-based practice.

Methodology

This study adopted a laboratory-based, within-subjects experimental design to systematically examine the neurophysiological and affective responses caused by exposure to contrasting urban environments in immersive virtual reality (VR). The integration of VR with electroencephalography (EEG) monitoring is increasingly recognized as a rigorous approach for investigating the impact of environmental stimuli on human cognition and emotion, providing both ecological validity and experimental control (Bohil et al., 2011; Gramann et al., 2014; Slobounov et al., 2015).

Three core technological components formed the experimental setup:

- *Meta Quest 2 Headset:* This VR headset delivers high-resolution, 360-degree video playback, allowing participants to experience urban environments fully immersed in it. Such immersive VR platforms have been validated in prior research for their ability to elicit naturalistic responses comparable to real-world experiences (Freeman et al., 2017; Slater & Sanchez-Vives, 2016).
- *Insta360 ONE X2 Camera:* Real-world urban scenes were captured using this professional-grade 360-degree camera, ensuring spatial fidelity, depth cues, and the preservation of environmental complexity. The use of real-world footage, as opposed to computer-generated imagery, enhances ecological validity and participant engagement (Pan et al., 2020).
- *Emotiv Insight EEG Headset:* Neurophysiological data were collected with this wireless, five-channel EEG device, which records brain activity from multiple cortical regions. The Emotiv Insight is widely used in mobile and VR-based EEG research due to its portability and ability to capture cognitive and affective states in naturalistic settings (Debener et al., 2012; Duvinage et al., 2013; Stytsenko et al., 2011).

A total of 63 adult participants (aged 20–60 years) were recruited through purposive sampling. The inclusion criteria were designed to minimize confounding variables and ensure participant safety and engagement:

- *Neurological and Psychiatric Health:* Individuals with a history of neurological or psychiatric disorders were excluded, as such conditions can influence EEG patterns and affective responses (Luck, 2014).
- *Cognitive Function:* Participants were screened for significant cognitive impairment, ensuring the validity of both subjective and neurophysiological data (Folstein et al., 1975).
- *Lifestyle Factors:* Preference for walking or spending time outdoors was assessed to ensure participants would be receptive to the environmental stimuli and to reduce the risk of cybersickness or disengagement during VR exposure (Stanney et al., 2020).

- *Substance Use:* Individuals with a history of substance abuse or recent intoxication were excluded to avoid confounding effects on cognitive and affective measures (Volkow et al., 2016).

All participants provided written informed consent, and the study protocol was approved by the Institutional Ethics Committee Review Board of National Institute of Technology Calicut in accordance with the Declaration of Helsinki.

Upon arrival, participants completed the Beck Depression Inventory (BDI) to screen for depressive symptoms, followed by a demographic and health questionnaire. This initial screening ensured participant eligibility and provided baseline data for subsequent analyses (Beck et al., 1996; Smith et al., 2018).

The experiment was conducted in a room arranged for the purpose where the experimental setup was done. The setup included a table and chair for the participant to fill in the initial questionnaire, space to fix the EEG headset, a VR headset connected to a computer, and sufficient space of 2m radius for free movement of the participant while using VR. The experimental room was sound-attenuated and maintained at a comfortable temperature to minimize external distractions and physiological confounds (Cacioppo & Tassinary, 1990).

The experiment was built into the VR headset using a VR game developing software called Unity. This helps organize the video exposure and facilitates participant navigation through the experiment.

To investigate the influence of urban form on cognitive and emotional responses, two distinct pairs of urban environments were selected and recorded as immersive 360-degree videos. The environments were chosen based on established urban design theory and evidence from environmental psychology, which highlight the role of spatial openness, greenery, and architectural features in shaping affective and cognitive outcomes (Kaplan & Kaplan, 1989; Ulrich, 1983).

- *Environment A:* This setting featured a high-rise residential urban form with abundant greenery, a calm waterfront edge, and contemporary architecture. Such environments are hypothesized to promote psychological restoration and positive affect, consistent with biophilic design principles (Kellert & Calabrese, 2015).
- *Environment B:* In contrast, this environment comprised a dense, high-rise commercial district with historic built forms, narrow pathways, high visual complexity, and no vegetation. These characteristics are associated with increased cognitive load and potentially heightened arousal or stress responses (Evans, 2003; Lederbogen et al., 2011).

Both videos were edited to a uniform duration of three minutes and the auditory ambience from field recordings was masked, ensuring that differences in participant responses are attributed fully to visual-spatial characteristics and not to auditory confounds (Kaplan, 1995).

First, a Stroop test was conducted to measure cognitive reactivity and attentional control. This was followed by the participant's exposure to a neutral, calming video for three minutes while EEG data were recorded, in order to establish a physiological and psychological baseline of the participants. Baseline EEG and Stroop performance provided reference points against which changes during VR exposure could be assessed (Cavanagh & Frank, 2014; MacLeod, 1991).

Participants were fitted with the Emotiv Insight EEG and Meta Quest 2 VR headsets. The exposure sequence was as follows:

1. *Neutral Calming Video (Washout):* A three-minute neutral video was presented to measure baseline EEG activity (Slobounov et al., 2015).
2. *Exposure to Environment A:* Participants viewed the first urban environment for three minutes, with continuous EEG data collection (Pan et al., 2020).
3. *Neutral Calming Video (Washout):* A three-minute neutral video was presented to minimize carryover effects and allow physiological parameters to return to baseline (Slobounov et al., 2015).
4. *Exposure to Environment B:* Participants viewed the second urban environment for three minutes, again with continuous EEG monitoring (Pan et al., 2020).

Immediately following the VR exposures, participants completed the Self-Assessment Manikin (SAM) to rate their affective responses—specifically arousal, valence, and dominance—toward each environment. The SAM is a widely used, non-verbal pictorial tool for capturing affective states and has been validated in VR-EEG research (Bradley & Lang, 1994; Mühlberger et al., 2007; Smith et al., 2018).

This comprehensive protocol was designed to maximize ecological validity, control for confounding variables, and ensure participant well-being throughout the experimental session. The integration of immersive VR and mobile EEG in a controlled laboratory environment represents a cutting-edge methodological approach in environmental neuroscience and neuroarchitecture research (Adli et al., 2017; Bohil et al., 2011; Gramann et al., 2014).

Data Analysis

EEG data were processed using EmotivPRO software, leveraging its integrated analysis tools for real-time and post-processed data evaluation (Emotiv, 2024; MindTecStore, 2024). The performance metrics described in Table 1 below were used to interpret participants' brain wave patterns and infer their current mental state as they navigated various urban spaces.

Table 1
EmotivPRO Performance Metrics and Associated EEG Bandwidths

State (Abbreviation)	Definition	Relationship with Bandwidth
Stress (FRU)	Measurement of how comfortable a participant is with a given task.	Elevated beta activity and reduced alpha and theta activities indicate stress and frustration.
Engagement (ENG)	Alertness and conscious direction of attention towards task-relevant stimuli.	Measured primarily through beta and gamma activity. High beta and gamma waves indicate higher engagement and cognitive workload.
Interest (VAL)	Degree of attraction or aversion to current stimuli, environment, or activity.	Correlated with beta and gamma activity, indicating mental stimulation and curiosity.
Excitement (EXC)	Awareness or feeling of physiological arousal with a positive value.	Associated with increased beta and gamma activity, reflecting arousal and heightened emotional states.
Focus (FOC)	Measure of fixed attention to one specific task.	Strongly linked to beta wave activity, indicating sustained attention and concentration.
Relaxation (MED)	Measure of an ability to switch off and recover from intense concentration.	Higher alpha and theta wave activity are indicators of relaxation and meditative states.

In addition to raw EEG data, participant responses to the Self-Assessment Manikin (SAM) scale were used to triangulate findings, providing a multi-modal assessment of emotional and cognitive states (Bradley & Lang, 1994).

Results

Exposure to green environments (Environment A) was associated with increased alpha activity and reduced beta activity in the frontal and parietal regions of the brain. These neural patterns indicate a state of greater psychological comfort and diminished cognitive stress among participants (Kaplan & Kaplan, 1989; Ulrich, 1983). In contrast, dense, historically textured environments (Environment B) evoked elevated beta activity, which is typically linked to heightened alertness and stress responses (Evans, 2003; Lederbogen et al., 2011). Consistent with these neurophysiological findings, participants self-reported a stronger sense of relaxation, safety, and pleasantness in green, low-density spaces, as opposed to compact and visually chaotic settings (Gascon et al., 2016).

Analysis of participant responses revealed notable differences related to gender and age. Women demonstrated higher emotional sensitivity to spatial qualities such as colour, lighting, and enclosure (Smith et al., 2018). Conversely, men were more influenced by the scale and openness of the environment (Smith et al., 2018). Additionally, older participants displayed greater stress indicators when exposed to denser urban environments, whereas younger participants tended to be more cognitively stimulated by environmental complexity (Smith et

al., 2018). These findings highlight the importance of considering demographic diversity in the design and evaluation of urban spaces.

Discussion

The results affirm the psychological importance of urban form and environmental quality. Green spaces and accessible layouts contribute not only to ecological health but also to neurological well-being (Kaplan & Kaplan, 1989; Ulrich, 1983). The variation in emotional response across age and gender groups indicates that urban design must adopt inclusive and adaptive strategies (Smith et al., 2018).

The use of EEG in this context demonstrates how neuroscience can extend the toolkit available to urban designers. Rather than relying solely on subjective reporting, EEG allows for real-time, quantifiable insight into the cognitive-emotional experience of space (Bohil et al., 2011; Gramann et al., 2014).

The implications for planning in rapidly urbanising countries like India are significant. With increasing pressure on land and infrastructure, there is a tendency to prioritise efficiency over experiential quality. However, this study underscores that neglecting psychological comfort may lead to long-term societal costs in terms of public health and social cohesion (United Nations, 2022; World Health Organization, 2011).

Conclusion

This study provides empirical evidence that urban design directly affects psychological and cognitive states. By integrating virtual reality and EEG, it offers a methodological framework for evaluating design strategies before they are implemented in the real world (Bohil et al., 2011; Gramann et al., 2014). Such evidence-based approaches are crucial for creating cities that are not just functional, but humane and health-promoting (Adli et al., 2017).

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this manuscript, the author(s) utilized generative AI and AI-assisted technologies to assist in writing, improving, and proofreading the text. Specifically, OpenAI's language model (Perplexity) was employed to support the drafting and structuring of the introduction, background, methodology, results, discussion, and conclusion sections.

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Urban Crime Prevention Through Participatory Planning: Integrating Data, Technology and Community Insights in India

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Abstract

This paper examines the interplay of crime data, participatory planning and digital connectivity in the context of Indian cities, highlighting the critical role of community participation in fostering sustainable and safe urban environments. Crime statistics from the National Crime Records Bureau-NCRB from 2015 to 2022 and literature about urban experiences and residents' perceptions in Indian cities are analysed. A mixed method of quantitative crime trend analysis and qualitative thematic reviews of urban experiences is used to assess the dual role of technological integration and social cohesion in understanding crime patterns and assisting crime prevention. The study underscores that data-driven approaches, when combined with participatory mechanisms, can enhance urban governance significantly. The intrinsic aspect of the Indian social fabric plays a critical and positive role in shaping community dynamics which are characterised by collective vigilance. The NCRB data indicates that the areas with strong community networks- marked by high levels of social interaction, trust and collective vigilance- demonstrate lower rates of violent crime. Conversely, poor visibility and lack of accessibility show higher crime rates, highlighting the impact of urban design on public safety. The study acknowledges that while digital connectivity and data analytics enhance governance efficiency, they cannot replace social cohesion and well-designed public spaces which play a pivotal role in deterring crime. The findings emphasize the need for a integrating community engagement into governance frameworks, ensuring equitable digital literacy, access and connectivity fostering partnerships between local governments and community organisations, for socially sustainable and safe communities in an increasingly complex urban landscape.

Keywords: urban crime, data-driven governance, participatory planning, community cohesion, digital inclusivity, resilient urban environments

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Introduction

India is experiencing an unprecedented phase of urbanisation that is rapidly transforming its social, economic, and spatial landscape. According to the 2011 Census of India, 31.16% of the country's population lives in urban areas (Office of the Registrar General & Census Commissioner, 2011) and this figure is expected to grow to 40% by 2036, accommodating over 60 crore (600 million) people (National Commission of Population, 2020). This trend places India among the fastest urbanising nations, trailing China in terms of urban population size (United Nations, 2023). This has brought about significant socio-economic transformations, leading to the expansion of urban areas and the emergence of new infrastructural developments across India. While urbanisation offers opportunities for economic growth, infrastructure development and improved access to services, it also exacerbates vulnerabilities, particularly concerning crime and social disorder. The urban landscape in India has undergone a remarkable transformation over the past decades, with cities expanding both in population ad spatial extent. This urban growth has been accompanied by escalating concerns about various kinds of crime especially violence against marginalised groups, notably women and children. The safety and security of the urban open spaces is put to question with these growing concerns. The interplay between urban planning and crime prevention has become a focal point in addressing violence against women, necessitating a comprehensive examination of how built environment can be leveraged to enhance safety and mitigate violence. The urban fabric in India is complex, featuring stark contrasts between affluence and deprivation, organised urban form and chaotic sprawl, and formal governance and informal systems. These dichotomies create fertile grounds for social disorganisation, a key theoretical lens to understand urban crime. Social Disorganisation Theory posits that elevated residential mobility, ethnic diversity and poverty undermine community cohesion and diminish informal social control (Banerji & Ekka, 2016). Routine Activity Theory further explains that crimes transpire when motivated criminals intersect with eligible targets in the absence of capable guardians, frequently influenced by the spatial and temporal factors (Maniyan, 2023). India's socio-political environment also contributes to the challenge. The urban governance is often fragmented, with multiple agencies operating with limited coordination. This fragmentation hampers timey response to crime and undermines efforts to develop unified safety frameworks. Moreover, the underreporting of crime due to stigma, fear of retaliation and distrust in law enforcement clouds the actual scale of urban crime. The issue of Crime against women in India is a severe one that has drawn more attention lately. The number of recorded incidents of violence against women in the nation has been steadily rising. According to the National Crime Records Bureau (NCRB), there has been a consistent rise in reported cases of crime against women, with 4,45,256 cases registered in 2022 (National Crime Records Bureau, 2023) up from 4,28,278 in 2021 (National Crime Records Bureau, 2022) and 3,71,503 in 2020 (National Crime Records Bureau, 2021). These statistics underscore the urgency of addressing women's safety in the context of urban development. However, many experts believe that these figures underrepresent the true magnitude due to systemic and cultural barriers to reporting (Müller et al., 2022).

There are substantial social and financial costs associated with violence against women and girls for people, communities, and countries. In addition to limiting women's potential and impeding efforts to reduce poverty, it interferes with their engagement in civic life, work and education. It leads to economic setbacks, diminished professional opportunities and decreased productivity. The effects are multifaceted, placing financial and operational strain on social services, health care providers, the judicial system and businesses and they deal with the costs

of addressing violence, including rehabilitation, medical care, and legal actions. These demands divert resources from broader developmental priorities (UN Women, 2016). A structural impediment to sustainable development, violence against women undermines inclusive growth while perpetuating social marginalisation and gender inequality.

Urban crime, especially violence against women, is not merely a policing problem- it is a planning problem. The design, layout and function of urban spaces significantly influences crime patterns. Poorly lit streets, isolated alleys and underutilised parks are not just symptoms of neglect but active enablers of criminal behaviour. Urban planning, particularly through the lens of Crime Prevention Through Environmental Design (CPTED) is crucial in this context. CPTED posits that the physical environment can be structured to deter criminal behaviour and enhance perceived and actual safety. Yet, urban design alone is insufficient without the inclusion of community voices. Participatory planning offers a democratic approach to city-making, here residents co-create solutions based on lived experiences, Studies have shown that when communities are engaged in urban governance, there is a marked improvement in collective efficacy, leading to reduced crime and enhanced mental well-being (Müller et al., 2023). The 2030 Agenda for Sustainable Development emphasises the urgency of taking immediate action to create resilient egalitarian communities by acknowledging that the eradication of violence is essential to reaching global development goals (Kumari et al., 2025). This paper posits that a comprehensive strategy for urban crime prevention in India must integrate spatial planning, community participation and technological tools. The goal is not to only deter crimes but to foster inclusive urban environments that support rehabilitation and social cohesion for proactive crime governance.

Data and Methodology

This research relies predominantly on secondary data sources. The NCRB datasets spanning a period of 8 years from 2015 to 2022 have been used for the data on crime statistics of crimes against women. (National Crime Records Bureau, 2016; 2023). However, considerations must be made for the data obtained from the NCRB, which is a reputed and reliable source of data in the country, as the compiled data in the NCRB reports is prone to under-recording and under-reporting of crimes across the various States and UTs. For example, more literate States with higher public participation might report more crimes because of higher awareness and exposure to legal systems, while less institutionalized States might have lower reporting rates even with higher crime rates (Ghosh, 2021; Pooja et al., 2024; Ritu, 2023). Such variation can lead to inconsistencies that may affect inter-State comparisons. Furthermore, cultural factors, such as stigma attached to reporting certain crimes, especially those involving violence against women, could add to under-reporting in some areas. Moreover, the National Family Health Survey (NFHS) and the National Crime Records Bureau (NCRB) supplement each other's views on violence against women in India but are varying in scope and methodology (International Institute of Population Sciences, 2021; National Crime Records Bureau, 2023; Suman Kumari, 2025).

The National Crime Records Bureau (NCRB) is the government agency mandated to collect crime statistics in India. Thus, it is one of the most credible datasets released by the GoI in relation to crime. The NCRB data is collected systematically from police records nationwide and offers detailed information on different types of crimes, including crimes against women. Being a government publication, it is extensively accepted as a credible secondary source of crime data, providing standardization in definitions, classification, and reporting measures between States and UTs. Standardization renders the dataset appropriate for inter-State

comparisons and longitudinal analysis since it reduces inconsistencies resulting from irregular data collection mechanisms.

Results

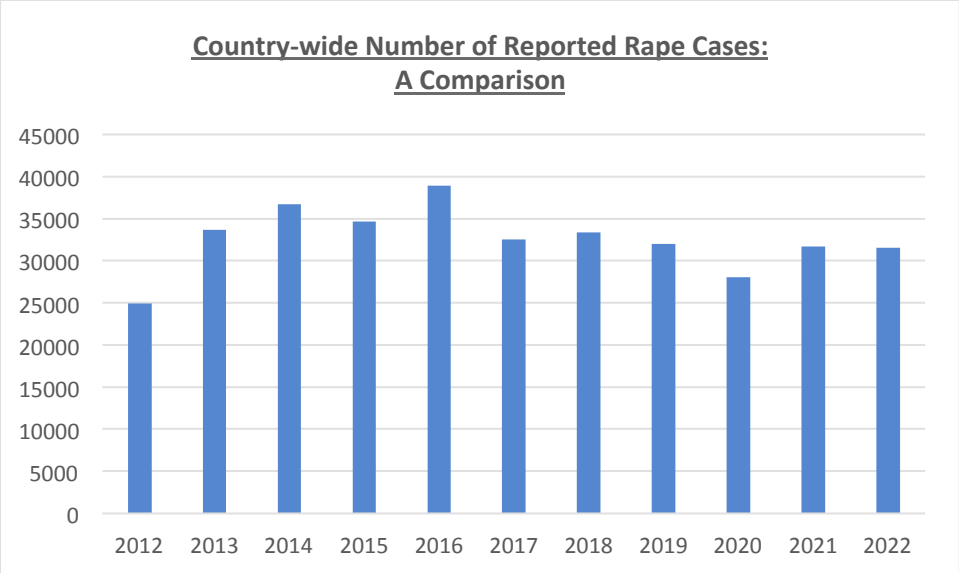
The National Crime Records Bureau (NCRB) has the crime statistics against women, which indicate alarming trends. The number of reported cases of sexual harassment, molestation, and assault increased over 36% between 2012 and 2022 (National Crime Records Bureau, 2013, 2023).

Key findings of NCRB reports:

- Women's crimes increased from 2.4 lakh in 2012 to 4.5 lakh in 2022.
- Delhi continued to record the highest number of crime against women with 25% of total urban city cases.
- Public areas, bus stops, and railways were identified as high-risk areas for molestation.

Figure 1

Comparison of Country-Wide Number of Reported Rape Cases



Source: National Crime Records Bureau (2013, 2023)

As per the National Crime Records Bureau (NCRB), there were significant differences in the number of rape cases registered in India between 2012 and 2022 (National Crime Records Bureau, 2013, 2023). The reported rape cases increased from 24,923 in 2012 to 31,677 in 2021, averaging 86 incidents per day (National Crime Records Bureau, 2023). Madhya Pradesh (2,947), Maharashtra (2,496), Uttar Pradesh (2,845), and Rajasthan (2,337 cases) had the highest number of rape cases in 2021, as per the NCRB's "Crime in India 2021" report (National Crime Records Bureau, 2016, 2021, 2023).

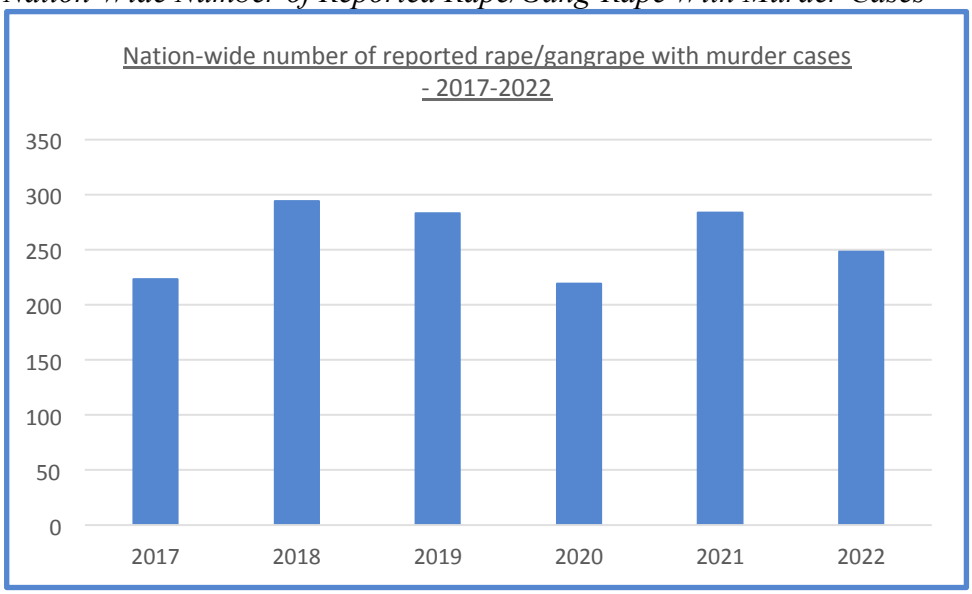
Table 1
Country-Wide Number of Reported Rape Cases: A Comparison

Year	No. of Cases
2012	24923
2013	33707
2014	36735
2015	34651
2016	38947
2017	32559
2018	33356
2019	32033
2020	28046
2021	31677
2022	31516
Total	**299520**

Source: National Crime Records Bureau, 2013, 2023

NCRB started reporting statistics of rape or gang rape leading to murder from the year 2017 (Commonwealth Human Rights Initiative, 2024; National Crime Records Bureau, 2018). Before 2017, NCRB conceded that, as per the principle of "principal offence" (the offence with the most severe penalty), only murder would be reported from such cases for inclusion in its annual CII reports (Commonwealth Human Rights Initiative, 2024; National Crime Records Bureau, 2018). Until 2022, six years of comparative data are available. In the period from 2017 to 2022, 1,551 incidents were reported in this category. This is approximately 258 cases per year on average. (National Crime Records Bureau, 2023) There were the maximum number of instances (294) in 2018 and the minimum (219) in 2020 (National Crime Records Bureau, 2021). There have been approximately five (4.96) rape/gangrape with murder cases every week on average (National Crime Records Bureau, 2018, 2021, 2023).

Figure 2
Nation-Wide Number of Reported Rape/Gang-Rape With Murder Cases



Source: National Crime Records Bureau (2023)

In the first year of the pandemic, the gang-rape cases reduced by 22% from the previous year (while rape cases reduced by a mere 12.44% in comparison). indicates the number of cases in this category reported countrywide, year by year (Commonwealth Human Rights Initiative, 2024; National Crime Records Bureau, 2021).

Table 2

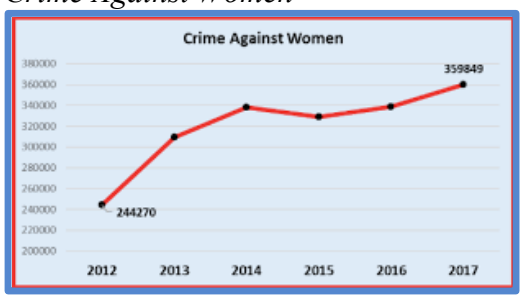
Nation-Wide Number of Reported Rape/Gang-Rape With Murder Cases

Year	Cases
2017	223
2018	294
2019	283
2020	219
2021	284
2022	248
Total	1551

Source: National Crime Records Bureau (2018)

Figure 3

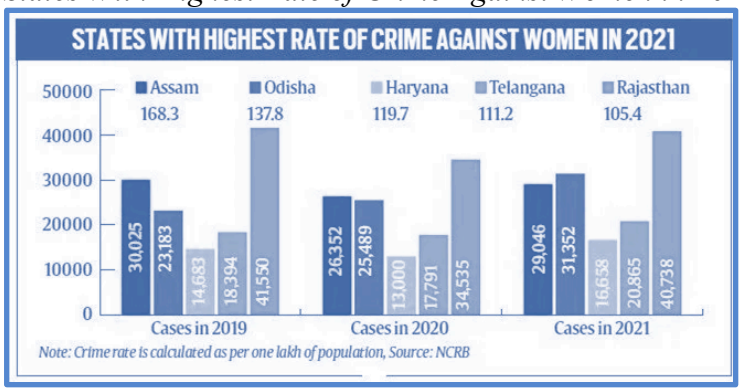
Crime Against Women



Source: National Crime Records Bureau (2018)

Between 2012 and 2017, crimes against Indian women had a growing trend according to the National Crime Records Bureau (NCRB) (National Crime Records Bureau, 2013, 2018). The number of crimes against women in 2012 was around 2.44 lakh cases, which went up to 3.59 lakh cases in 2017 (National Crime Records Bureau, 2013, 2018). The rate of crime, per one lakh women, increased from 41.7 in the year 2012 to 57.9 in 2017 (National Crime Records Bureau, 2018). The incidence of rape grew from 24,923 in 2012 to 32,559 in 2017 (National Crime Records Bureau, 2018). Uttar Pradesh registered the maximum number of crimes against women at all times, whereas the highest crime rate per lakh population was reported by states such as Assam. Domestic violence (IPC Section 498A), rape (Section 376 IPC), and assault on women (Section 354 IPC) continued to be the most reported offenses (National Crime Records Bureau, 2018). Yet, though legal reforms took place, conviction rates were still low, and underreporting remained a challenge. The period also witnessed cyber-crimes against women on the rise, an indication of shifting patterns of crime (National Crime Records Bureau, 2023).

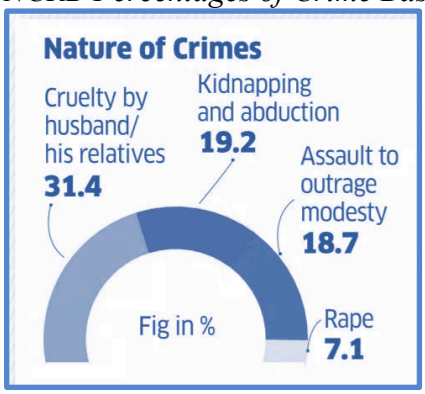
Figure 4
States With Highest Rate of Crime Against Women in 2021



Source: National Crime Records Bureau (2022)

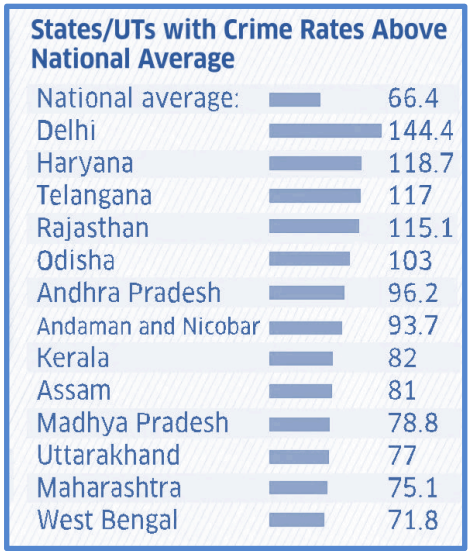
Crime against women doubled in India in 2021, the National Crime Records Bureau (NCRB) found, with a 15.3% rise over the last year. In 2020, there were 56.5 crimes per 100,000 women; in 2021, 64.5 (National Crime Records Bureau, 2021, 2022). Reverse migration, social isolation, and economic hardship during the Covid-19 pandemic—all which saw heightened internal tensions—are attributed to the increase. Domestic violence remains a big issue, as per NCRB reports, and contributes to over 30% of crimes against women (National Crime Records Bureau, 2021). Additionally, in 2021, there were 31,677 cases of rape, which is 28,046 compared to 2020, highlighting the continuing issue of sexual assault. During the same year, 1,250 rape cases were registered in Delhi (National Crime Records Bureau, 2023). The fact that such crimes keep happening underlines the necessity for more effective implementation and social transformation, even when more stringent rules and punishments were enacted after 2012, including the Criminal Law (Amendment) Act, 2013, and setting up fast-track courts (Agarwal, 2023; Sengupta, 2022). The increase in cases that have been documented could also be attributed to survivors' growing confidence to report and end age-old stigmas surrounding sexual assault. Yet, the evidence suggests that to be able to successfully counter and reduce the prevalence of rape and gang rape in India, multifaceted approaches tackling societal attitudes, police responsiveness, and support mechanisms for survivors need to be introduced alongside legislative reforms.

Figure 5
NCRB Percentages of Crime Based on Classification by Nature



Source: National Crime Records Bureau (2023)

Figure 6
States /UTs With Crime Rates Above the National Average



Source: National Crime Records Bureau (2023)

Women's crimes in India rose by 4% in 2022 to 445,256 cases from 428,278 in 2021 (National Crime Records Bureau, 2021, 2022). The rise was most pronounced in urban cities, where there was a 12.3% rise, or 48,755 cases. Delhi reported the highest number of these cities with 14,158 incidents, followed by Bengaluru (3,924) and Mumbai (6,176) (National Crime Records Bureau, 2022). Interestingly, Jaipur recorded the highest crime rate against women at 239.3 per 100,000 female population, more than Delhi (186.9) and Indore (174.3). The majority of them were under rape (7.1%), assault with intent to outrage modesty (18.7%), kidnapping and abduction (19.2%), and cruelty by husbands or relatives (31.4%). Specifically, 1,204 rape cases—or an average of about three cases a day—were registered in Delhi in 2022 (National Crime Records Bureau, 2022).

Geographical Variations in the Crime Rate

A more detailed reading of NCRB data accounts for the fact that some cities experience a consistent higher crime rate than others. For instance:

- Delhi (40,000 in 2022) has been described as the most unsafe city for women, mostly due to poor policing and a lack of gender-sensitive urban planning.
- Mumbai, being the economic centre of India, has relatively lower crime rates due to well-lit streets, community police being present, and gender-segregated public transport facilities but still has crime against women over the national average.
- Kolkata experiences lower sexual violence rates than other metropolitan cities, which is primarily attributed to high-density urban areas with greater pedestrian visibility.

Role of Urban Planning in Crime Prevention

Crime Trends in Urban Areas

Crime patterns, particularly violence against women in urban areas, are significantly influenced by urban planning and design. Inclusive planning on aspects of visibility, accessibility and social integration has emerged as a major determinant of curbing such crimes. Indian urban crime has seen mixed trends over the past decade. Based on the NCRB

reports, crime against women such as rape, sexual harassment, domestic violence and stalking rose substantially between 2012-2019, reaching a peak in 2020 (National Crime Records Bureau, 2021). Delhi, Mumbai, Bangaluru and Kolkata had the highest consistent rates of crimes against women (National Crime Records Bureau, 2023). The 2020-2021 COVID lockdown resulted in domestic violence cases on the rise, reflecting a shift in crime due to spatial lockdown (National Crime Records Bureau, 2022). This further proves that most violence against women is inflicted in public spaces with poor infrastructure and weak policing. Isolated public places, dark roads and vacant urban spaces are found to be high risk areas for women. Crime trends indicate that isolated city areas, lack of surveillance and ineffective policing are factors in the increasing threat to women's safety. These results highlight the need for urban planning approaches that incorporate security elements into the built environment.

These statistics show that crime rates are not increased merely due to urbanisation but are significantly influenced by the built environment and state institutions.

Providing safe housing, better policing, and gender-sensitive urban development can significantly reduce the risks faced by women in informal settlements. Addressing the root causes—poverty, lack of education, and social exclusion—remains key to mitigating crime against women in these vulnerable urban spaces.

The data reveals that states with poor urban infrastructure, limited surveillance, and restricted visibility report higher incidents of crime against women. Conversely, cities that prioritize inclusive urban planning, well-lit public spaces, and active community participation tend to exhibit lower crime rates. This suggests that the design and governance of urban spaces play a critical role in determining the safety and security of women in public areas.

Inferences and Role of Technology in Urban Crime Management

1. Understanding the spatial and demographic distribution of crime is essential for designing targeted interventions in urban safety planning. NCRB serves as a primary repository of crime statistics, but its data, while comprehensive in some respects, lacks the fine-grained spatial resolution and real-time accessibility. The NCRB does not yet provide crime data with spatial granularity to inform ward-level or neighbourhood level planning. Integrating crime statistics with municipal GIS systems and Smart City dashboards could significantly enhance planning precision. This would allow safety interventions to be hyper-localised and evaluated continuously for effectiveness. Longitudinal analysis of NCRB data when correlated with urban design parameters such as land use, lighting infrastructure, population density and gender ratios can provide valuable insights into crime trends.
2. Research by Maniyan (2023) involving a survey of 320 women across different Indian states found that the perception of safety is closely tied to physical attributes of urban spaces. Women reported avoiding poorly lit streets, enclosed bus stops and underpasses- areas that lack visibility and escape routes. Moreover, the fear of crime often outweighs the actual victimisation, significantly affecting how different demographic groups interact with urban spaces. Woman and the elderly, in particular, often self-restrict their movement due to perceived threats. This restricts their access to employment, education and social life, thereby contributing to broader gender and age inequalities in urban living. These fear patterns must therefore be addressed through data-informed spatial planning and policy.

3. Advanced analytics and machine learning now allow urban planners and criminologists to go beyond basic statistics. By integrating crime data with Geographic Information Systems (GIS), researchers can visualise and analyse crime hotpots and clusters in real-time. For instance, overlay od crime incidence on population density, open space availability and lighting infrastructure can help to identify high-risk zones. These tools are especially helpful for law enforcement in resource-constrained setting, enabling more effective deployment of patrols and surveillance infrastructure (Banerji & Ekka, 2016).
4. Participatory GIS is another valuable tool, where community members contribute data about unsafe zones through digital platforms. This democratizes crime mapping and ensures that official data is supplemented with on ground realities, particularly in informal or underserved areas where crime reporting is often minimal.
5. Urban form and zoning regulations also influence crime patterns. For example- monofunctional zones- areas designated for a single use like housing or industry- tend to become isolated after certain hors, providing cover for illicit activities. Mixed use zone, in contrast, encourage round the clock activity and natural surveillance.
6. Public transport infrastructure is another critical correlate. Studies indicate that women face the highest risk of harassment during transit, particularly in underregulated public transport stands, poorly monitored buses and isolated train stations (Fraser et al., 2017; Varghese, 2020). Enhancing visibility, installing CCTV, and creating safe transit corridors -especially during off-peak hours – are proven deterrents that need wider adoption.
7. Crime trends are also seasonal and temporal. Data from NCRB indicates spikes in certain crimes during festival seasons, at night and in low-traffic hours. Urban design must therefore incorporate temporal considerations- such as increased lighting during high-risk periods, adaptive surveillance strategies and variable policing shifts.

Policy Recommendations

Impact of Public transport and Mobility Infrastructure

Women are more vulnerable to crime when commuting. Surveys indicate that 58% of women feel unsafe while using public transport at night (Safetipin, 2013). Key safety challenges include:

- Poorly monitored bus stops and railway stations
- Lack of gender segregated transport facilities
- Inadequate CCTV surveillance

Efforts such as Mumbai's Women's -Only Local Trains have proven successful in reducing harassment cases, demonstrating that gender-sensitive transport planning can improve safety. NCRB statistics indicate that cases of sexual harassment and stalking are disproportionately higher in urban transport systems. Inadequately monitored metro stations, dark bus stops and crowded public transport systems lead to heightened vulnerability (Mahadevia & Gough, 2020). Smart surveillance, panic buttons and women only transport facilities have been implemented in major cities to counter these threats.

Safe and Inclusive Public Spaces

Community Participation in City Planning

Ensuring that marginalised groups, notably women and elderly, are involved in urban planning can significantly improve safety outcomes. Citizen-led urban audits have proven effective in cities like Bengaluru and Hyderabad, where women have successfully lobbied for better street lighting and bus stop safety measures.

Smart Urban Infrastructure and Surveillance

Technological advancements in AI-powered crime mapping, CCTV surveillance and emergency response systems can help law enforcement predict and prevent crimes. Cities like Jaipur and Pune have initiated smart lighting projects, reducing night-time crimes against women.

Inclusive Urbanism

Policies must mandate gender budgeting, social impact assessments and crime audits in urban development projects. The Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines in India could be revised to explicitly incorporate inclusivity and safety as core planning goals.

Conclusion

Urban design and planning have a great impact on crime patterns in cities, determining the safety and well-being of their residents. One of the most important aspects of this connection is how well-planned and inclusive environments can make everyone, especially, women and children safer. Technology has become a game changer in urban safety. Crime prevention in India requires a holistic, multi-dimensional framework that integrates participatory planning, spatial design, data driven governance and community-based interventions. Traditional policing-centric approaches, while necessary, are insufficient to address the structural and spatial roots of urban crime. As urbanisation accelerates, so does the complexity of crime patterns, necessitating proactive and inclusive solutions.

Intelligent surveillance, panic buttons in public transport systems, and mobile apps that enable women to report harassment in real-time, though currently in use, must all be broadened in scope for impactful implementation to enhance security. Several Indian cities have introduced mobile apps that give women direct access to police support and emergency response teams, making it possible for action to be taken against crimes more quickly. In addition, the use of artificial intelligence (AI) in public security infrastructure—e.g., AI-powered cameras that identify suspicious behaviour—has been found to be effective in preventing crime. Urban policy initiatives that adopt technological solutions not only reduce crime but also create an enabling environment that stimulates active engagement in urban life.

Although these improvements have been made, there are still serious challenges. Much of the urban public space is still ill-maintained, and implementation of safety policies is not consistent. Statistics show that even in cities with established safety mechanisms, a lack of public awareness and low trust in the police discourage women from reporting crime. Solving

these problems needs a multi-faceted strategy, such as improved training of law enforcement officers on gender sensitivity, enhancing public confidence in security systems, and providing quick judicial processes to punish the perpetrators. Furthermore, making urban safety policies accessible to all socioeconomic groups is important, as poor women tend to be at greater risk of gender-based violence but have limited access to safety measures.

Education and awareness campaigns play a crucial role in changing attitudes in society regarding gender-based violence. Promoting bystander intervention, supporting gender-sensitive learning programs in schools, and organizing safety workshops at universities can foster a culture of accountability and respect for each other in cities. Projects that involve men and boys in training on gender equality and respectful behaviour have also proved to be effective in minimizing harassment and violence against women in public areas.

The importance of community engagement cannot be overstated. Participatory planning platforms- ranging from safety audits and digital mapping apps to neighbourhood watch programs and youth-led design labs- play a crucial role in identifying vulnerabilities and co-creating solutions that are locally grounded and socially accepted. This requires urban planners, healthcare professionals, civil society actors and community members to work in tandem under a shared vision of restorative urbanism.

In conclusion, well-planned, inclusive, and community-driven urban spaces significantly contribute to reducing gender-based violence. Integrating safety measures into city planning, fostering local community engagement, and leveraging technological innovations are essential strategies to ensure safer urban environments Meeting these challenges necessitates an inter-sectoral response that integrates governance, law enforcement, urban planning, and community engagement to ensure cities in which women can travel with ease without exposure to violence. Urban policies in the future need to persist in ensuring gender-sensitive strategies so that safety in the urban areas is informed by the underpinning principles of city planning and development. Indian cities must shift from reactive, punitive responses to proactive, inclusive governance. This means institutionalising data transparency, embedding community voices in planning processes and designing urban environments that are inherently safe and equitable for all.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this manuscript, the author(s) utilized generative AI and AI-assisted technologies to assist in writing, improving, and proofreading the text. Specifically, Grammarly for language checks and OpenAI’s language model (Perplexity) was employed to support the formatting.

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The Contemporary Identity Communication Models of Thai Phuan in the Digital Era: A Case Study of Nakhon Nayok

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Abstract

This research is a qualitative research. There are 2 objectives: 1) to study contemporary identity communication models of Thai Phuan in the digital era, and 2) to design media and messages for contemporary identity communication of Thai Phuan in the digital era. The study shows that to create effective contemporary identity communication models of Thai Phuan in the digital era, there should be an improvement in all communication elements as follows 1) Analyze the target audience, specifically new-generation tourists, to identify their preferences and demands for tourism experiences 2) Design messages that align with the needs and expectations of new-generation tourists 3) Utilize communication channels frequently used by new-generation tourists, selecting platforms that effectively reach and engage this audience and 4) Shift the role of the communicator to new-generations who understanding of both the content and the preferred communication channels. The study also found that the media and message design for contemporary identity communication of Thai Phuan in the digital era should determine the use of elements of the graphic appearance from local wisdom as follows: 1) Graphic appearance should be composed of artistic elements that effectively convey objects, activities and stories of local cultural wisdom 2) Layout composition that consist of logo, key visual, color, pattern, picture and artwork should applying knowledge of art and culture as a guide for design.

Keywords: identity communication, contemporary art, Thai Phuan, design

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Introduction

The Thai Phuan community is a long-established ethnic group with art and culture that has been inherited across generations. The Thai Phuan people possess a strong sense of pride in their unique cultural heritage. The community has received tourism promotion support from government agencies. However, these aspects are facing potential loss due to the aging population challenges arising from a high aging society the pervasive influence of modern digital technology replacing traditional analog social structures.

Research Objective

1. To study contemporary identity communication models of Thai Phuan in the digital era.
2. To design media and messages for contemporary identity communication of Thai Phuan in the digital era.

Methodology

1. Document Analysis: A comprehensive analysis of relevant documents and existing research was conducted to establish a theoretical framework and contextual understanding.
2. Semi-structured Interviews: Individual, semi-structured interviews were conducted with key informants, including community leaders, local residents, and representatives from cultural networks.
3. Focus Group Discussions: Focus group discussions were held with residents from four distinct villages within the community to gather diverse perspectives and insights.
4. Media Production for Dissemination: The findings of this research informed the production of media materials specifically designed for dissemination to the target audience of younger generation tourists.

Result and Discussion

This study successfully achieved its two primary objectives by providing a comprehensive understanding of contemporary identity communication models for the Thai Phuan in the digital era and offering practical guidelines for designing effective media and messages. The research was a qualitative study focusing on the Thai Phuan in Ko Wai Subdistrict, Pak Phli District, Nakhon Nayok Province.

Contemporary Identity Communication Models of Thai Phuan in the Digital Era

The contemporary identity communication model for Thai Phuan in the digital era must encompass all communication components: 1) studying the receiver group, specifically new-generation tourists, 2) identifying message content rooted in identity that can create unique selling points for the Thai Phuan community, and 3) selecting channels that effectively reach new-generation tourists, suitable for the digital age. Communication across these three components ensures a complete dimension of Thai Phuan identity communication.

Studying the Receiver Group: New-Generation Tourists

In studying contemporary Thai Phuan identity models in the digital era, focusing on the communication components of sender, receiver, message, and media, the receiver is the critical initial component. Data from the Public Policy Studies Institute Foundation (Komkrit,

2022) identified 11 types of future tourists based on their expected values when visiting Thailand. For the Thai Phuan community tourism, it addresses four specific tourist personas: (1) World Protector, (2) Relationship Builder (tourism for fostering relationships, valuing atmosphere, and spending time building familial and friendly ties), (3) Believer (tourism connected to religion, valuing sacred sites and peaceful environments), and (4) World Explorer. Community leaders from all four villages unanimously agreed that the Thai Phuan community in Nakhon Nayok effectively meets the characteristics of these future tourist personas.

Studying Message Content Rooted in Identity to Create Unique Selling Points for the Thai Phuan Community

The long-standing Thai Phuan cultural way of life, with content selected by the community as "good things" according to Phuan culture, forms the basis of their selling slogan: *"Enjoy Phuan fun delight by the canal bank visit the museum, meet Phuan in Pak Phli savor cultural ways indulge in local 'tok' meals join in preserving local wisdom."* Analyzing this slogan reveals that while Thai Phuan communities in the same area share a collective identity, each community—Faang Klong, Ko Wai, Ban Mai, and Tha Daeng—possesses unique strengths highlighted as their distinct Thai Phuan selling points. In this research, students from the College of Social Communication Innovation experimentally produced media content and provided it to the communities for promotional use, demonstrating that each area has non-overlapping selling points. Communicating these distinct local identities can further enhance value through differentiation.

Selecting Channels to Reach New-Generation Tourists

Data on communication channel selection was gathered through interviews with community leaders, with media production carried out by the younger generation, considering the variable of time. Details are as follows:

(1) Media for tourists seeking cultural tourism information: This media is for pre-travel research and decision-making. It should convey impressions, enjoyment, and a promise of the experiences awaiting them. Channels for this group include social media platforms like TikTok, infographics, and YouTube content from previous visitors.

(2) Media for visitors already at the location: This aims to enhance learning, especially for groups on study tours organized by entities like local administrative organizations or educational institutions (primary, secondary, and non-formal education). Essential media for this segment includes a video introduction to the area, presented as a documentary providing comprehensive basic community information that can serve as a starting point for further learning within the community or for discussions with local experts.

(3) Media for sharing experiences and impressions after visiting: This media is crucial for communicating post-visit experiences, enabling tourists to check-in, review, and recommend the destination to others. These are primarily social media channels such as TikTok, YouTube, and infographics.

Designing Media and Messages for Contemporary Thai Phuan Identity Communication in the Digital Era

The cultural identity of the Thai Phuan people in Ko Wai Subdistrict, Pak Phli District, Nakhon Nayok Province, currently comprises their language, food, customs and traditions, performing arts, and attire.

Based on this study, the use of graphic appearance elements derived from local wisdom can be defined. Graphic design for communication is categorized into three parts to represent the organizational identity of the Thai Phuan cultural group in Ko Wai Subdistrict, Pak Phli District, Nakhon Nayok:

1. Primary Components: Graphic elements constructed from artistic components that can effectively communicate objects, activities, and stories of local cultural wisdom.
2. Secondary Components: Graphic elements constructed from artistic components used as supplements or explanations to the primary components, clarifying objects, activities, and stories of local cultural wisdom.
3. Layout Composition: The arrangement of primary and secondary components to communicate objects, activities, and stories of local cultural wisdom.

Organizational identity is a crucial characteristic that displays or indicates the prominent and accepted art, culture, resources, environment, local wisdom, community, and social ways of life. These elements can represent the Thai Phuan cultural group by applying knowledge of art and culture as a guide for designing cultural identity communication for the Thai Phuan in Ko Wai Subdistrict, Pak Phli District, Nakhon Nayok, both in terms of art and culture and for commercial purposes.

The components of organizational identity for communicating Thai Phuan cultural identity in Ko Wai Subdistrict, Pak Phli District, Nakhon Nayok, include:

1. Logo: Composed of a primary symbol shared by the community as a symbolic representation of the Thai Phuan community in Pak Phli District, Nakhon Nayok, and a secondary symbol related to community activities or administrative divisions.
2. Key Visual: Includes icons as graphic prototypes for communicating the Thai Phuan community in Pak Phli District, Nakhon Nayok.
3. Color Identity: Defines the characteristic colors.
4. Pattern Identity: Defines characteristic patterns.
5. Picture: Refers to photographic or illustrative elements.
6. Artwork: Specifies proportions and examples of artwork layout for promotional media (e.g., brochures, posters, signs, tourist maps, packaging, attire, souvenirs).

Discussion

1. **The presentation of Thai Phuan cultural identity in Ko Wai Subdistrict, Pak Phli District, Nakhon Nayok, focuses on tangible cultural aspects** such as language, food, customs, performing arts, and attire. These elements are readily accessible for tourists within a limited timeframe, aligning with a tourism approach that emphasizes sensory immersion for a memorable experience. Using tangible culture to express identity rapidly engages visitors, consistent with Thanaphet's (2022) study on cultural identity promotion for Thai Yuan community tourism in Ton Tan Subdistrict, Sao Hai District, Saraburi Province. That study suggested that physical tourism identity includes allowing tourists to experience the ancient Ton Tan Floating Market, the Thai Yuan Folk Culture Hall, temples,

and community structures, alongside cultural identity aspects like language, performance, attire, and food.

2. **Communicating Thai Phuan identity in the digital era requires comprehensive communication elements**, including sender, receiver, message, and media. The process of producing digital media must identify the receiver, their tourism needs, and their preferred media channels. Social media remains highly popular, consistent with Saengduangkae's (2021) study on local identity communication to promote tourism in Ko Mak Subdistrict, Pak Phayun District, Phatthalung Province. That study found that Facebook pages and video media were effective, with community members actively participating in media production from planning to execution. While the context of the Thai Phuan community involves tourism managed by the elderly, making direct media production by them challenging, a clear communication design and shared objectives, combined with external contributors (e.g., university students) who understand digital audience needs, can be highly effective. When these external collaborators learn cultural content and the community verifies accuracy, it ensures targeted communication without cultural distortion.
3. **Cultural Identity of Thai Phuan in Ko Wai Subdistrict, Pak Phli District, Nakhon Nayok.** The study found that the Thai Phuan in Ko Wai Subdistrict, Pak Phli District, Nakhon Nayok, actively strive to preserve their traditional beliefs and customs through the Phuan language, food, traditions, performing arts, and attire. These elements of identity transmission in Pak Phli Thai Phuan align closely with findings from studies on Thai Phuan in the Northeast, which show that Thai Phuan have cultural products resulting from social interaction that reflect their identity and have become their cultural heritage (e.g., language, hand-woven fabrics, pha khama e-po, pha sin, mongkol 9 si, Phuan Ka-ler (Wiwatpatapee et al., 2022). Specifically, the continued use of the Phuan language or Thai Phuan language in communication within the Thai Phuan group supports George Herbert Mead's concept that language is central to self-creation, serving as a channel to transmit systems into shared symbols and social rules. Furthermore, this similarity reflects that despite living in different areas, Thai Phuan communities continue to inherit similar cultural products, characteristic of an ethnic community with three shared dimensions: a common name (Thai Phuan), shared myths of origin and descent, and a shared history (Smith, 1986, as cited in Suntornpesaj, 2005).
4. **Designing Organizational Identity for Thai Phuan Cultural Identity Communication.** The logo incorporates graphic shapes of a man playing the *khaen* and a Thai Phuan woman performing the Phuan dance, a prominent tradition of the Pak Phli Thai Phuan. This aims to communicate a memorable image of the Pak Phli Thai Phuan, consistent with the distinct characteristics of traditional media that reflect ethnic identity and ways of life unique to each locality (Kaewthep, 2002).
5. **Key Visual and Color Identity** utilize elements from the community for designing icons and defining primary communication colors, such as community architecture, attire, and Thai Phuan textiles. Selecting community-specific elements for design reflects the Pak Phli Thai Phuan's identity through visible signs that convey their unseen, unique identity. This aligns with Hall's (1977) concept that self-definition through representation involves selecting distinct, vibrant, easily understandable, and widely recognized characteristics while downplaying less interesting aspects of identity.
6. **Pictures and Artwork** for promotional media integrate other organizational identity components with design principles such as color usage, image composition, and proportion. This is consistent with Sirichana's (1996) principles of artistic composition for print media promotion, which outlines six key criteria: 1) Proportion in determining sizes and proportions for elements like logos; 2) Balance in arranging elements for visual

equilibrium; 3) Emphasis to highlight important sections; 4) Rhythm through repetitive and continuous movement; 5) Unity in harmonizing various elements; and 6) Harmony in the appropriate fit of components for coherence. All these aim to create, maintain, protect, and promote a positive image, ensuring the Thai Phuan of Ko Wai Subdistrict, Pak Phli District, Nakhon Nayok, leave a favorable impression on society.

7. **Organizational identity design** also resulted from the researchers' fieldwork and the community's involvement in selecting cultural identities for communication. This aligns with Intanai et al. (2021), who found that community-participatory media development clearly showcases tourist attractions, lifestyles, and cultures. Such community involvement also empowers the Thai Phuan of Ko Wai Subdistrict, Pak Phli District, Nakhon Nayok, to recognize their self-worth and gain confidence. Community communication initiatives, even from a small part of the community, can elevate awareness and responsibility across the entire community to address issues and increase the volume of meaningful media (Kaewthep, 2002).

Conclusion

1. Analyze the target audience, specially new-generation tourists, to identify their preferences and demands for tourism experiences
2. Design messages that align with the needs and expectations of new-generation tourists
3. Utilize communication channels frequently used by new-generation tourists, selecting platforms that effectively reach and engage this audience
4. Shift the role of the communicator to new-generations who understanding of both the content and the preferred communication channels Thai Phuan in the digital era should determine the use of elements of the graphic appearance from local wisdom as follows
5. Graphic appearance should be composed of artistic elements that effectively convey objects, activities and stories of local cultural wisdom
6. Layout composition that consist of logo, key visual, color, pattern, picture, and artwork should apply knowledge of art and culture as a guide for design

Limitations of the Research

1. This is a qualitative research study. Data was collected from community leaders who primarily define concepts, directions, and cultural ways of life. While they are insiders and owners of the culture, most are elderly, which may present some generational limitations. Therefore, further survey research with younger generations who inherit Phuan culture would be beneficial. However, during the fieldwork, many young people were working outside the community, limiting data collection from this group of cultural inheritors.
2. It would be valuable to collect data from policy-level stakeholders at the provincial level regarding their approaches to developing Thai Phuan culture. This would allow the research findings to inform the design of cultural initiatives in the area.

Recommendations From the Research

1. Academic Aspect: The research yielded findings on cultural identity communication models tailored to tourist personas, highlighting tourism characteristics that align with the area's capital or potential. This will be a crucial variable in communicating and creating sustainable tourism experiences.
2. Social and Community Utilization: The relevant communities can utilize the developed media and message sets for presenting contemporary Thai Phuan identity in various digital

contexts, such as tourism promotion, empowering modern communities, and passing on Thai Phuan ways of life to future generations.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

I used Gemini, a generative AI, for translation assistance and to verify reference formatting (APA style) in this manuscript. The content and intellectual contributions remain my own.

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Navigating Dual Roles: Indonesian Migrant Workers as Students at Universitas Terbuka Taiwan

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Abstract

Indonesian migrant workers in Taiwan face different challenges and opportunities to migrant workers from other countries in Taiwan, as they work while pursuing higher education through Universitas Terbuka Taiwan (UT Taiwan). This research explores how they simultaneously balance their dual roles as workers and students. This study utilizes a qualitative research approach by using in-depth and semi-structured interviews to understand the roles of Indonesian migrant workers as students and workers in Taiwan. This research used a purposive sampling strategy using 30 Interviewees; the interviews were conducted online. The criteria for selecting Interviewees are as follows: 1) Status as Indonesian migrant workers in Taiwan, 2) Registered as an active student at UT Taiwan, and 3) Active as a worker and student at UT Taiwan. The results show that access to flexible online learning opportunities empowers workers to improve their skills, aspire to better livelihoods in the future, and prepare to return to Indonesia. The study concludes that Indonesian migrant workers simultaneously engage in learning and working activities to continue their unfulfilled dreams. Distance learning conducted by UT Taiwan is a means for them to obtain a bachelor's degree, which is one of the important assets for continuing their careers when they return to Indonesia. Distance learning and methods that support migrant workers can contribute to broader issues such as lifelong learning, labor mobility, and transnational education.

Keywords: Indonesian migrant workers, dual roles, distance learning, transnational education

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Introduction

The context of globalization, the movement of labor across borders has become increasingly prevalent, The COVID-19 pandemic has exposed the ambivalent position of migration as a pathway to human development (Suhardiman et al., 2021). The movement of labor in Southeast Asia is an issue of growing interest and increasing importance (Tipayalai, 2020). The concept of social justice has similarly been subject to contention, as dominant and influential stakeholders have either invalidated its significance or vigorously opposed its imperatives (Bruce, 2021). A lengthy discussion on how best to integrate migrant workers into host societies is longstanding in discussions of migration and globalization studies (Goh & Lee, 2022).

Indonesian migrant workers (IMWs) in Taiwan are a notable part of the transnational labor force (Wang, 2022). Temporal changes from border shifts involve migrant workers experiencing public health crises and labor market shortages (Lan, 2022). Many Indonesian migrant workers in Taiwan still struggle with a lack of skills, limiting their performance and economic independence (Wisnujati et al., 2024). Bonding and linking social capital, forming strong friendships and relationships with employers to access resources and support for Indonesian migrant workers (Guritno & Aryo, 2024). IMWs remit a significant amount of their earnings to Indonesia, contributing to their country's national income and helping to reduce unemployment (Maksum et al., 2020).

Migrant workers often experience systemic barriers to access to education (Evsyukova et al., 2025; King, 2024). The migration of skilled workers can facilitate knowledge transfer and increase productivity, but it also raises concerns about brain drain from the home country (Prato, 2025). IMWs play an important role in Taiwan's economy and their efforts through increased education and entrepreneurship. IMWs help Taiwan's labor shortage, especially in the manufacturing and construction sectors, and they also help Taiwan's economic growth (Maksum et al., 2020).

E-learning, online education, and distance learning have become increasingly popular in recent years, particularly in response to the COVID-19 pandemic (Culduz, 2024). Distance learning has both advantages and disadvantages compared to face-to-face learning (Childs et al., 2024). Success in distance learning challenges open universities to meet the expectations of students and stakeholders (Zuhairi et al., 2020). Distance learning can increase the ability to interact and participate as the barrier of fear is removed (Al-Tkhayneh et al., 2022). Learning activities that are relevant to current developments are 21st-century learning (Nora et al., 2023). This paper examines the dual roles of Indonesian Migrant Workers (IMWs) as both employees and students at Universitas Terbuka Taiwan (UT Taiwan), exploring how they navigate these roles and the impact on their personal and professional development.

Migrant students often face discrimination and social isolation, which hurts their academic performance and mental well-being (Abdusamatov et al., 2024; Clothey & McCommons, 2022), and this can be the case for migrant workers who are also continuing their education.

Experiencing obstacles in working, which is their source of finance coupled with college, is a challenge for migrant workers. According to Streitwieser et al. (2019) is higher education institutions and policymakers should adopt a longer-term perspective, increase transparency, and use evidence-based approaches to develop and evaluate support programs for migrant workers.

Migrant workers, mainly from Indonesia, experience many challenges, including employer support, culture, time management, and mental health. However, these challenges are opportunities for their career education advancement, besides the system that supports reducing these challenges that allow them to succeed in achieving their dreams as undergraduates. This study aims to see how the dual role of Indonesian Migrant Workers (IMWs) in Taiwan plays a role as workers and students in carrying out activities together.

Methods

The qualitative approach in this study is using in-depth interviews to collect data from IMWs in Taiwan. The researcher selected 30 IMWs to be interviewed using the following criteria: 1) Indonesian migrant workers in Taiwan, 2) status as a student at UT Taiwan, and 3) Willingness to be interviewed. Interviews use Zoom to accommodate the time and location of IMWs' residences. Triangulation is carried out to analyze research findings from various data sources, methods, and theories as a form of credibility and validity in this study (Meydan & Akkaş, 2024).

Table 1
Interviewees Indonesian Migrant Workers in Taiwan

Interviewees	Age (years)	Gender	Length of work (years)	Sectors
Interviewee 1	24	Woman	4	Domestic workers
Interviewee 2	25	Woman	4	Domestic workers
Interviewee 3	26	Woman	3	Domestic workers
Interviewee 4	24	Woman	6	Domestic workers
Interviewee 5	25	Woman	5	Domestic workers
Interviewee 6	28	Woman	4	Caregiver
Interviewee 7	30	Woman	6	Domestic workers
Interviewee 8	30	Woman	6	Domestic workers
Interviewee 9	31	Woman	6	Caregiver
Interviewee 10	28	Woman	7	Caregiver
Interviewee 11	26	Woman	7	Caregiver
Interviewee 12	36	Woman	8	Domestic workers
Interviewee 13	21	Woman	4	Factory
Interviewee 14	26	Man	3	Factory
Interviewee 15	25	Woman	4	Caregiver
Interviewee 16	22	Woman	6	Domestic workers
Interviewee 17	23	Woman	4	Domestic workers
Interviewee 18	28	Woman	5	Caregiver
Interviewee 19	30	Woman	6	Caregiver
Interviewee 20	24	Man	3	Factory
Interviewee 21	23	Man	7	Factory
Interviewee 22	25	Man	6	Factory
Interviewee 23	26	Man	5	Factory
Interviewee 24	23	Man	5	Factory
Interviewee 25	24	Woman	5	Domestic workers
Interviewee 26	25	Woman	4	Domestic workers
Interviewee 27	26	Woman	3	Domestic workers
Interviewee 28	25	Woman	3	Domestic workers

Interviewees	Age (years)	Gender	Length of work (years)	Sectors
Interviewee 29	24	Woman	3	Factory
Interviewee 30	26	Woman	4	Factory

Result and Discussion

The current number of foreign migrant workers in Taiwan is significant, with many coming from Indonesia. The following data from the Ministry of Labor on the country of origin of workers in Taiwan indicates that Indonesian workers represent a substantial portion of the foreign labor force. This influx has contributed to Taiwan's economy and created unique challenges for these workers as they balance employment with academic pursuits (Soraya & Chen, 2022).

Table 2
Foreign Workers in Taiwan by Nationality and Gender

Nationality	Total	Male	Female
Indonesia	**274,547**	**92,757**	**181,790**
Vietnam	223,713	150,564	73,145
Philippines	159,774	69,159	90,615
Thailand	71,104	60,255	10,849

Data Source Statistics from the Ministry of Labor, March 2025.

Their dual roles as workers and students present unique challenges and opportunities for personal and professional development. IMWs who have a variety of education before leaving for work in Taiwan. The findings of this study suggest that the desire to learn by IMWs in Taiwan is very high, and UT Taiwan, which organizes distance education, plays an important role in supporting IMWs' aspirations.

Flexible Learning Opportunities

The availability of flexible online learning opportunities through UT Taiwan enables migrant workers to balance their work and study commitments. This flexibility is crucial in allowing them to pursue higher education without sacrificing their employment.

The combination of work and study for IMWs in Taiwan creates polar emotions, including stress and anxiety, as migrant workers struggle with ideal time management. These emotions also impact their academic performance. UT Taiwan, as an organizer of distance education, is the answer for IMWs for higher education so far, working while studying.

> The study and work time is very flexible. However, the lack of support from my new employer has made. The break in focus has resulted in my work and learning not being maximized. The new employer has not yet adapted to employees taking on multiple roles. However, I am trying to overcome the problem by dividing my time during the day to focus on studying at night. From 9.00 at night, I can focus on studying. (Interviewee 9)

UT Taiwan, as the organizer of distance learning, provides flexibility for IMWs to learn anywhere because learning can be accessed through the page https://elearning.ut.ac.id/. UT Taiwan also sends printed modules to IMWs throughout Taiwan. IMWs in Taiwan who work

during the day can open the learning website at every day. The flexibility of time in learning is what IMWS finds helpful and by their working position.

UT Taiwan has a distance learning support system through its e-learning; besides that, UT Taiwan also has activities outside of learning, such as student organizations, to foster a sense of togetherness among students. The experience of IMWs also highlights the importance of resilience and adaptability in the face of obstacles in pursuing education while fulfilling their obligations as workers. Their experience was illustrated through extensive empowerment in education, ultimately leading to better opportunities after returning to Indonesia. This education can have a significant impact because IMWs have a perception to change their view of their role in improving socio-economic status. Their dual role responsibilities can contribute positively to their families and communities. This dual journey plays an important role in redefining their identity and liberating societal stereotypes that migrant workers also have the right to higher education. Higher education paves the way for a brighter future for IMWs in Taiwan with various experiences and learning while at UT Taiwan while working in Taiwan.

Skill Enhancement and Career

Higher education improves the knowledge and skills of migrant workers, which also contributes to their work so far. One of them said that “studying while working makes me easier and more skilled in communicating” (Interviewee 1). UT Taiwan students have hope for the future: “I want to return to Indonesia and work even better after graduating from this college” (Interviewee 15).

Indonesian migrant workers in higher education seek to empower them to improve their skills and knowledge, contributing to their professional development. After returning to Indonesia, the Interviewees expressed aspirations for better career opportunities and better livelihoods. They seek to improve their skills and abilities to foster confidence and seek positions according to their expected qualifications by attending university. As they acquire new knowledge and competencies, these migrant workers are better equipped to contribute to their communities and drive economic growth in their hometowns, as stated “Sometimes, people think education is unimportant, but education is essential for me” (Interviewee 13).

The skills gained through higher education at UT Taiwan led to increased remittances, as educated migrants often landed higher-paying jobs, thus benefiting their families and communities back home. The cycle of education and economic support, as well as expectations to improve the quality of life, is in line with the aspirations of migrant workers. The potential of educated migrant workers as agents of change in the community to inspire others as education plays an important role in encouraging sustainable development in Taiwan.

The knowledge and experience possessed by IMWs in their dual role can motivate them to pursue the same path as other migrant workers. This can contribute to the broader community's appreciation of lifelong education. Education initiatives are a form of policy that must be continued. UT Taiwan addresses the gap with easy and affordable distance learning in upskilling migrant workers in the job market, which will broadly impact the socio-economic contribution of Taiwan and Indonesia in the future.

Fulfillment of Personal Aspirations

Indonesian migrant workers (IMWs) in Taiwan pursue higher education as a form of fulfilling personal dreams that have not been achieved before leaving for Taiwan. Achieving this education is a means to improve future career prospects and a form of satisfaction and achievement for IMWs personally.

> I can improve, get used to time management, upgrade communication, and hopefully, I will be able later. Also, when dealing with anything, we become more critical thinkers. (Interviewee 3)

IMWs hope for future educational success. IMWs who study become role models in the community, inspiring others to pursue higher education. These are small but big effects on human development. This educated IMWs trip should be an opportunity for UT Taiwan to socialize more widely. The dual role of workers and students can be done together and have a positive impact on the individual IMWs and the community in general.

This collective improvement can lead to increased community resilience and benefit Indonesia, as educated individuals are better positioned to address local challenges in Taiwan and advocate for community needs in Taiwan. Through their educational journey, IMWs cultivate a sense of identity beyond their worker role, reflecting a commitment to lifelong learning and community improvement. This transformation underscores the profound impact of education on the personal and social levels.

Distance Learning Challenges for Indonesian Migrant Workers in Taiwan

Balancing the dual roles of workers and students demands effective time management. Migrant workers often work long hours, leaving limited time for academic activities. One of the interviewees studied at night.

> ... UT provides opportunities for me to continue their studies is very advantageous because the time is more flexible so that I can do studying at night; it is just that the lack of teaching and learning interaction makes me feel a little difficult to understand the teaching materials in the module ... (Interviewee 10)

There are also UT Taiwan students who have difficulty meeting assignment completion deadlines. As a result, many migrant workers report feelings of overwhelm, which can hinder their academic success and overall well-being. In addition, this online-based learning also causes burnout as they struggle to find a sustainable balance between their responsibilities as students and workers. The emotional burden of juggling work and study can also manifest in decreased motivation and engagement with the lecture material. UT Taiwan must recognize these challenges and provide tailored support services, such as counseling and academic guidance, to help migrant workers navigate their unique circumstances.

IMWs find themselves in a cycle in which the need to provide for their families overshadows their educational aspirations, creating significant barriers to their academic pursuits. According to students, studying at UT Taiwan is affordable. “The more affordable the cost of studying here is, the more it will help me achieve my dream of becoming an undergraduate” (interviewee 17). By reducing the financial burden, these initiatives can empower migrant

workers to prioritize their education, ultimately enabling them to achieve their academic and career goals.

Access to technology and reliable internet is critical to the success of distance learning undertaken by IMWs. IMWs face challenges related to accessing computers that they did not have before. However, this does not hinder their ability to participate in learning because they finally meet their learning needs by buying adequate devices. At first, they felt isolated and frustrated as they struggled to adapt to remote learning, gradually getting used to it. Fortunately, such concerns did not occur as IMWs were already familiar with information technology.

Distance learning can lead to isolation, as students may not have the in-person support and interaction in the offline classroom. “Being a migrant worker and a student is not easy, but now migrant workers can easily want to be students because distance learning makes it possible” (Interviewee 27). UT Taiwan, through distance learning, has provided programs to connect migrant workers with all the access they need to fulfill academic travel, including seminars and events with fellow UT Taiwan students or alumni. UT Taiwan strives to create a positive environment for academic improvement and skill growth for IMWs. This support provides many benefits to IMWs in Taiwan, such as enhancing the academic culture expected for human development.

Discussion

The dual role of Indonesian migrant workers (IMWs) as students and employees requires policies within the framework of education as a form of support for their unique circumstances, increased access to resources, and building a collaborative environment. Educational institutions, including UT Taiwan, can play a role in turning the challenges so far into opportunities for growth and empowerment for IMWs. This balance of dual roles among IMWs gives them their position as people who have an impact on the migrant worker community in Taiwan. Personal transformation that benefits both individuals and creates motivation for other IMWs. This education is very important for the community to continue to develop, especially in the long term, because education is a way to change and grow the personality of IMWs. Investment in education for IMWS also contributes to creating a superior, more educated, and empowered society for Indonesia. Societies with higher education are easy to encourage in growth both economically and socially because educated individuals have an easier tendency to engage and advocate for environmental improvement.

The balance of dual roles as workers and students certainly has unique challenges and opportunities experienced by Indonesian migrant workers. Universitas Terbuka (UT) Taiwan, in this case, has an important role through flexible distance learning able to meet the educational needs of IMWs. Adaptability is also important in pursuing educational goals without sacrificing their work obligations. The interview results stated that IMWs had a positive impact after studying at UT Taiwan, including communication, problem-solving, and managerial skills. This is by the view Bykova et al. (2024) that education will be a factor in improving the workforce's skills, knowledge, and abilities in improving productivity at work.

The decision to pursue education after college graduation has many facets, involving a combination of personal motivation, social influence, financial considerations, and institutional factors. The results of this study illustrate that IMWs who aim to continue their education after graduating from UT Taiwan will also be IMWs who will return to Indonesia

and look for new jobs. This research is in line with research Boneva et al. (2022) that the goal of students to pursue higher education as a form of achieving future curry prospects in order to be able to compete in the job market.

Distance learning offers a form of time flexibility and affordability in learning. Bismala and Manurung (2021) state that distance learning increases student satisfaction and improves learning outcomes. The advantages of distance learning make it an attractive choice for IMWs in Taiwan. IMWs who study remotely through UT Taiwan benefit significantly due to the flexibility of time and more affordable costs. However, distance learning still has challenges, such as self-management, potential technical issues, and a lack of face-to-face interaction (Turan et al., 2022). IMWs conveyed the need for UT Taiwan to continue to provide technical support, more interactive materials, and more flexible schedules.

Conclusion

Distance learning conducted by Indonesian migrant workers (IMWs) through Universitas Terbuka (UT) Taiwan provides a solution for time flexibility and affordability of education costs. Remote communication is beneficial in shaping the quality of communication, building a problem-solving mindset, and improving management skills for IMWs in Taiwan. Through distance learning, UT Taiwan is an important means to obtain a degree in higher education; this is an important asset for IMWs after graduation to continue their education and find a new job after returning to Indonesia. This distance learning supports broader issues and community socio-economic development through lifelong learning, labor mobility, and transnational education.

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Risk Communication for Raising the Thai's Risk Perception Regarding COVID-19 via "Thailand's Know How to Fight With COVID-19" Social Media Initiative

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Abstract

COVID-19, a respiratory infection caused by a novel coronavirus, was first identified in December 2019 in Hubei Province, China, and rapidly spread around the globe. On February 4, 2020, the World Health Organisation declared it a Public Health Emergency of International Concern (PHEIC). Thailand reported its first case on January 12, 2020, and classified COVID-19 as a dangerous communicable disease effective March 1, 2020, establishing a COVID-19 Situation Administration Center under then-Prime Minister General Prayuth Chan-o-cha. The pandemic profoundly impacted global health, resulting in widespread illness and death while altering social behaviors and creating a "New Normal." The rapid dissemination of both accurate and misleading information led to public panic and risky health behaviors. In response, the Ministry of Public Health launched the "Thai Roo Soo COVID" or "Thailand's Know How to Fight With COVID-19" social media initiative on March 4, 2020, aimed at providing reliable information and fostering public trust. This effort included platforms such as Facebook, Line, Twitter, Instagram, TikTok, and YouTube, amassing over 5.146 million followers and generating more than 7.878 million interactions daily. The platform's success is attributed to its effective communication strategy, which emphasizes positive messaging and engages diverse age groups. It has improved access to health services and vaccinations, ultimately reducing illness and mortality rates while boosting public confidence in government actions. This study offers valuable insights for healthcare professionals and policymakers to enhance risk communication and health awareness for future health crises.

Keywords: risk communication, risk perception, COVID-19, Thailand's Know How to Fight With COVID-19, Thai Roo Soo COVID-19

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Background

The COVID-19 pandemic has had a profound and far-reaching impact on global health, leading to widespread illness, overwhelming healthcare systems, and causing significant loss of life across all regions of the world (World Health Organization, 2024). Beyond its direct health consequences, the pandemic has also triggered substantial social and economic disruptions, prompting changes in daily routines, work environments, and social interactions. These shifts have not only affected individual behaviors but have also led to a reevaluation of societal norms, often referred to as the "New Normal." This new paradigm is characterized by increased emphasis on personal hygiene practices, such as frequent handwashing and mask-wearing, widespread adoption of social distancing measures, and a shift toward remote work, online education, and virtual social engagements. These adaptations have been essential in curbing the spread of the virus but have also altered the fabric of daily life in profound ways (World Health Organization, 2024).

Thailand reported its first confirmed case of COVID-19 on January 12, 2020. Since that initial detection, the country has faced numerous challenges in managing the outbreak, including the need to implement effective public health measures, address economic repercussions, and manage public perception and compliance. As of recent reports, Thailand ranks 33rd among countries in terms of total reported COVID-19 cases, with approximately 4.77 million confirmed infections and over 34,500 fatalities. The rapid and extensive spread of the virus underscored the critical importance of clear, consistent, and effective communication strategies to inform the public about the risks, preventive measures, and updates related to the pandemic. However, the early response exposed notable gaps in communication from key government agencies such as the Ministry of Public Health (MOPH) and the Department of Disease Control. These deficiencies contributed to a climate of mistrust and confusion among the population, which in turn hampered efforts to promote adherence to preventive behaviors.

Moreover, the widespread dissemination of both accurate information and misinformation through various channels fueled public panic, anxiety, and, in some cases, risky health behaviors—such as panic buying or resistance to vaccination. Social media platforms played a dual role in this context. On one hand, they served as vital tools for rapid information dissemination, enabling health authorities to reach broad audiences quickly and interactively. On the other hand, social media also became conduits for misinformation, rumors, and false narratives, which could undermine public health efforts, exacerbate fear, and promote risky behaviors. The effects of social media on risk communication are complex: while these platforms can enhance engagement, foster community support, and promote health literacy when used effectively, they can also amplify misinformation and sensationalism if not properly managed (Cuello-Garcia et al., 2020).

Recognizing these challenges, the Thai Ministry of Public Health (MOPH) identified the necessity of establishing communication platforms that are semi-formal, friendly, and easily accessible designed to foster two-way interaction and build trust with the public. As part of this effort, the "TRSC-Thai Roo Soo COVID-19" initiative was launched on March 4, 2020. This campaign aimed to provide trustworthy, timely information, combat misinformation, and strengthen public confidence in health authorities. It sought to effectively communicate critical health messages not only to Thai nationals but also to foreigners residing in Thailand, recognizing the diverse cultural and linguistic needs of the population.

This article specifically examines how risk communication through the social media initiative "Thailand's Know How to Fight With COVID-19" has contributed to increasing risk perception among the Thai population. It explores the strategic approaches employed, assesses the effectiveness of messaging, and evaluates the overall impact on public awareness, attitudes, and behaviors during this ongoing pandemic. Furthermore, it considers the influential role social media platforms played in shaping public perception—highlighting both their potential to facilitate rapid, interactive communication and their risk of spreading misinformation. The study aims to provide insights into how digital communication strategies can be optimized for future public health emergencies, emphasizing the importance of trust, clarity, cultural relevance, and effective management of social media's dual effects in health communication efforts (Taisuwan et al., 2018; Tambo et al., 2021).

Objectives

This study seeks to identify how risk communication efforts via the "Thailand's Know How to Fight With COVID-19" social media initiative have influenced Thai citizens' perception of COVID-19 risks, thereby supporting more informed decision-making and health behaviors.

Method and Methodology

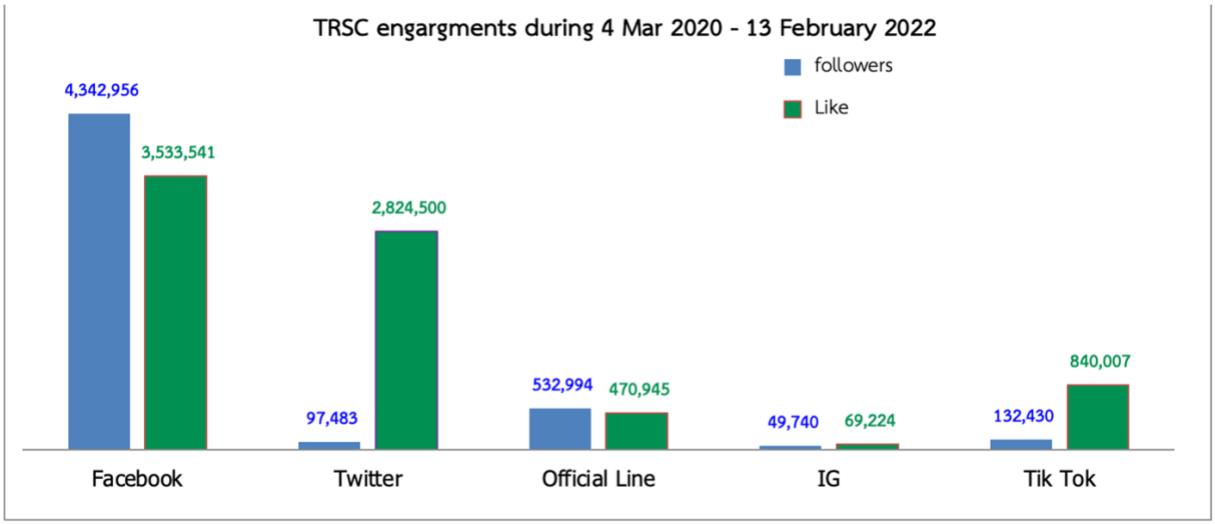
This study employed a mixed-methods approach, integrating both quantitative and qualitative data collection. Quantitatively, data were gathered through surveys comprising 59 questions from the Department of Disease Control (DDC) polls. Qualitatively, information was collected from social media comments and shares. The analysis examined follower engagement, including shares, comments, and the frequency of mentions related to three key keywords: mask-wearing, handwashing, and physical distancing. Additionally, vaccination was included as a focus for evaluation. Data collection took place from March 4, 2020, to February 13, 2022, yielding a total of 229,253 responses.

Finding

Thailand's Know How to Fight With COVID-19 Social Media Engagement

This initiative utilized platforms such as Facebook, Line, Twitter, Instagram, TikTok, and YouTube, collectively reaching over 5.146 million followers and generating more than 7.878 million interactions daily. Further details and trends are depicted in Figure 1. The data indicate that the TRSC Fan base consists of approximately 4.3 million followers on Facebook, 97,483 on Twitter (X), 0.53 million on Line, 49,740 on Instagram, and 130,000 on TikTok.

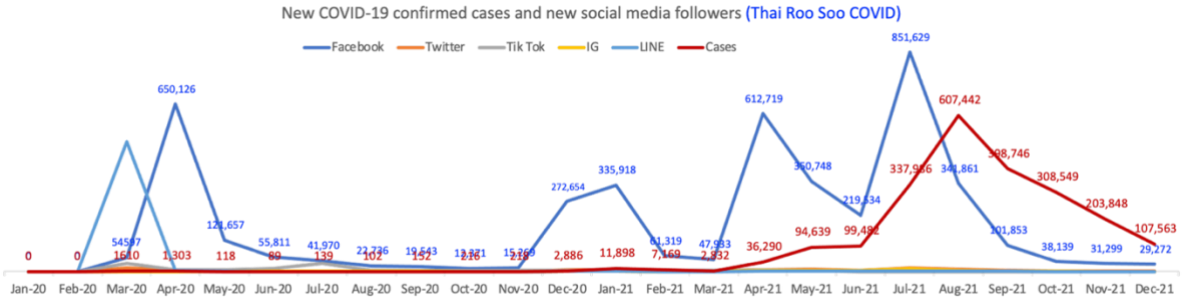
Figure 1
Thailand's Know How to Fight With COVID-19 Social Media Engagement



Perception of COVID-19 Risks Among Thai Citizens: The Influence of Information Dissemination

Thai citizens' perceptions of COVID-19 risks are influenced by the information circulating within society, which includes both "air war" and "ground war" communication strategies. The "air war" involves the dissemination of information through mass media, official statements, and government briefings, providing authoritative updates and guidance. In contrast, the "ground war" encompasses grassroots communication, community engagement, and interpersonal interactions that help shape public understanding at the local level, as illustrated in Figure 2. These combined communication efforts contribute to fluctuations in how citizens perceive and respond to the risks associated with COVID-19.

Figure 2
New COVID-19 Confirmed Cases and Social Media Followers of TRSC



However, in the digital age, social media platforms have become increasingly influential in shaping public perception. As the number of COVID-19 cases and deaths reported rises, social media's role intensifies, often amplifying the emotional responses of the public. The rapid spread of information—both accurate and misleading—can heighten fear, anxiety, or complacency among citizens, depending on the nature and framing of the messages they encounter.

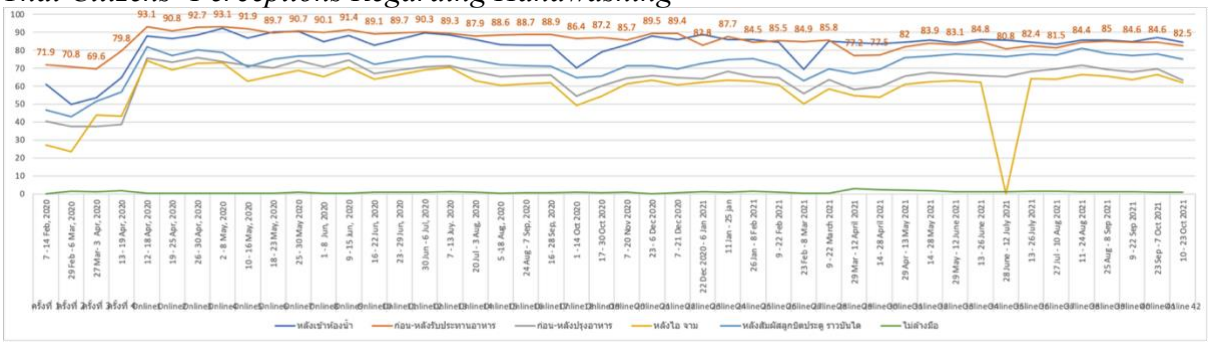
Furthermore, the continuous influx of reports about high case numbers and fatalities contributes to heightened risk perception, which may influence individuals' behavior and compliance with health measures. The dynamic interplay between official communications and social media content creates a complex environment where citizens' perceptions are constantly evolving, often affected by the tone, credibility, and volume of information circulating.

Thai Citizens' Perception Regarding the Three Key Keywords

Thai Citizens' Perception Regarding Handwashing

Figure 3

Thai Citizens' Perceptions Regarding Handwashing



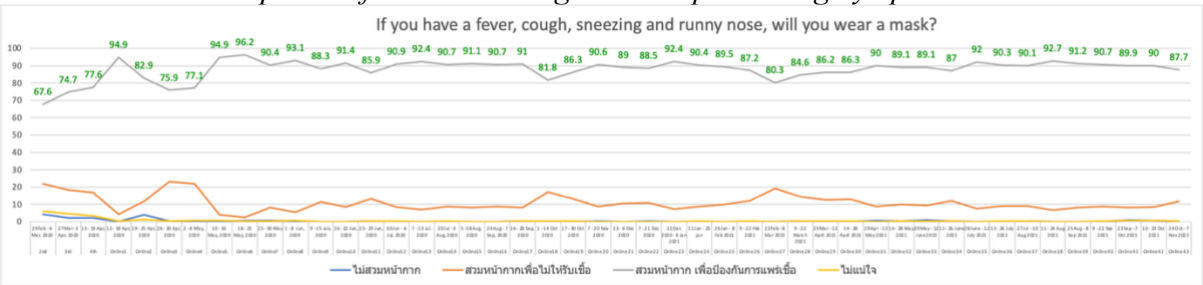
Among the key preventive behaviors during the COVID-19 pandemic, handwashing has been emphasized as a fundamental measure to reduce transmission of the virus. In Thailand, surveys and studies have shown that the majority of Thai citizens recognize the importance of hand hygiene. Specifically, approximately 80% of respondents perceive handwashing as a necessary practice, particularly after using the toilet, before meals, and before cooking. This high level of awareness indicates that public health messaging around hand hygiene has been relatively effective in reaching the population.

However, despite this generally positive perception, there are variations in compliance and understanding. For example, the lowest perception or adherence levels are observed in certain groups or specific situations—such as among some regions or age groups—where the importance of handwashing in other contexts, like after touching surfaces or before leaving the house, may be less emphasized or less practiced. Additionally, gaps in proper technique, frequency, and duration of handwashing can still exist, which may affect its effectiveness in preventing disease spread. Overall, while the perception of handwashing is high among Thai citizens, ongoing education and reinforcement are necessary to ensure consistent and proper practices across all segments of society.

Thai Citizens' Perception on Mask-Wearing When Experiencing Symptoms

Figure 4

Thai Citizens' Perceptions of Mask-Wearing When Experiencing Symptoms

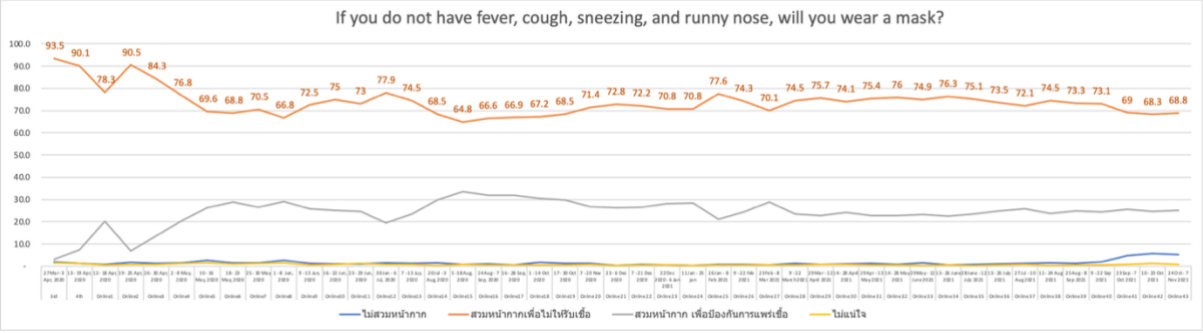


In Thailand, awareness of the importance of mask-wearing as a preventive measure during the COVID-19 pandemic is relatively high, with an average perception rate of approximately 84%. Specifically, this indicates that most Thai citizens recognize the need to wear masks if they experience symptoms such as fever, cough, sneezing, or a runny nose—common indicators that could suggest a contagious illness, including COVID-19. This high level of perception reflects effective public health messaging emphasizing personal responsibility and community protection through mask usage in symptomatic individuals.

Nonetheless, while the majority understand the importance of wearing masks when experiencing these symptoms, there may still be variations in actual practice. Some individuals may not consistently adhere to this behavior due to factors such as discomfort, social stigma, or lack of access to masks. Additionally, the perception does not always guarantee proper mask usage—such as wearing masks correctly covering both nose and mouth or replacing masks regularly. Maintaining this high perception level is crucial in curbing the spread of respiratory infections, especially during outbreaks, and ongoing public education efforts are vital to reinforce consistent and correct mask-wearing practices among the population.

Figure 5

Thai Citizens' Perceptions of Mask-Wearing Without Symptoms



Thai Citizens' Perception on Mask-Wearing When Without Symptoms

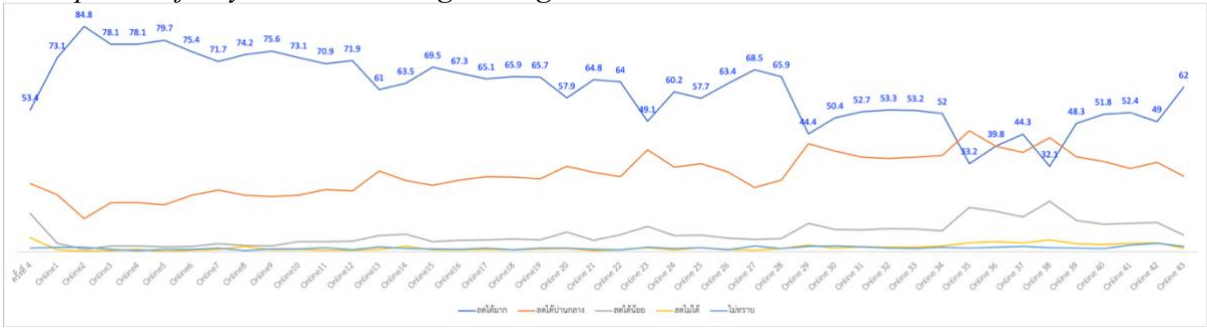
While awareness of the importance of mask-wearing among Thai citizens remains high overall, the perception of wearing masks when feeling asymptomatic (i.e., without symptoms such as fever, cough, sneezing, or runny nose) is comparatively lower, averaging around 72%. This indicates that although most people understand the need to wear masks if they are symptomatic, a slightly smaller proportion recognize the importance of mask-wearing as a preventive measure even when they feel healthy.

The lower perception in asymptomatic individuals may be attributed to several factors, including a sense of personal health and reduced perceived risk, discomfort or inconvenience associated with mask-wearing, or misconceptions about the necessity of masks for prevention without symptoms. Despite this, maintaining mask usage even when asymptomatic is crucial in mitigating silent transmission of COVID-19 and other respiratory illnesses, especially in crowded or enclosed settings. Public health campaigns continue to emphasize that mask-wearing is a collective responsibility and a key preventive behavior, regardless of whether one is feeling ill or not.

Perception of Physical Distancing Among Thai Citizens

Figure 6

Perceptions of Physical Distancing Among Thai Citizens



During the initial outbreak of COVID-19, awareness and adherence to physical distancing measures were relatively high, driven by urgent public health messaging and heightened concern about the virus. At that time, the perception of the importance of maintaining physical distance was notably strong, with an average adherence rate of around 56%. However, as the pandemic progressed and prolonged restrictions impacted daily life, adherence to physical distancing gradually decreased. Factors contributing to this decline include pandemic fatigue, economic pressures, social and cultural norms favoring close contact, and challenges in sustaining long-term behavioral changes.

Despite the decrease, maintaining physical distancing remains an essential component of infection control, particularly in crowded places and during surges. Public health authorities continue to promote awareness about the importance of physical distancing, emphasizing that it reduces virus transmission, especially when combined with other measures like mask-wearing and hand hygiene. Reinforcing these behaviors is vital to prevent future outbreaks and protect vulnerable populations.

Thai Citizens' Perception Regarding COVID-19 Vaccination at the Beginning of the Outbreak

At the onset of the COVID-19 pandemic, public perception among Thai citizens strongly favored vaccination as a critical measure to prevent infection and protect public health. Despite the COVID-19 vaccine not yet being available, many believed that vaccination would be essential once it became accessible, reflecting a high level of trust in vaccines as a safe and effective tool against the virus. However, as the vaccination campaign progressed, misinformation about vaccine safety and side effects began to spread rapidly through social media and other channels.

A significant concern arose from reports and rumors claiming severe side effects, including adverse reactions and even deaths attributed to the vaccine. This misinformation led many individuals to hesitate or outright refuse to receive the vaccine, fearing potential harm. The perception of risk associated with vaccination was heightened by stories of vaccine-related fatalities, which contributed to vaccine hesitancy and reduced vaccination uptake in some communities. This phenomenon underscored how misinformation could undermine public health efforts and emphasized the importance of transparent, credible communication to address fears and misconceptions.

Efforts to counteract these negative perceptions and misinformation are ongoing, aiming to rebuild confidence in the safety and efficacy of COVID-19 vaccines, which are essential for achieving herd immunity and controlling the pandemic in Thailand.

Increase in COVID-19 Vaccination Acceptance Among Thai Citizens

As the pandemic progressed and more information became available, public perception toward COVID-19 vaccination improved significantly. Initially, vaccine hesitancy was high due to fears and misinformation, but over time, efforts to promote vaccine safety and efficacy, along with increasing vaccine availability, helped reshape public attitudes. Consequently, the vaccination rate among Thai citizens rose markedly from near zero at the beginning of the campaign to approximately 77.6% of the population receiving at least one dose of the vaccine. This substantial increase reflects the success of public health initiatives, government outreach, and community engagement in building confidence and encouraging widespread vaccination. Achieving high vaccination coverage has been crucial in reducing COVID-19 transmission, severe cases, and mortality, and continues to be a key strategy in Thailand's pandemic response.

Discussion

Perceptions of COVID-19 risks among Thai citizens are highly fluid and tend to change in response to the information circulating within society. A higher perception of risk generally correlates with greater compliance with preventive behaviors and social distancing measures. Furthermore, awareness of the risk is linked to four key factors: demographic characteristics, individual traits, geographical location, and the timing of information dissemination (Cipolletta et al., 2022). The underlying reasons for vaccine hesitancy and acceptance are largely similar across different groups, with low vaccine uptake associated with lower levels of education and awareness, as well as perceived inadequacies in government efforts and initiatives (Shakeel et al., 2022).

Information dissemination during the pandemic can be broadly categorized into two strategies: "air war" and "ground war." The "air war" involves mass media, official statements, and government briefings aimed at delivering authoritative updates and guidance. In contrast, the "ground war" encompasses grassroots communication, community engagement, and interpersonal interactions that influence local understanding. As depicted in Figure 1, these combined channels play a crucial role in shaping public perception and response to the ongoing pandemic (Taisuwan et al., 2018).

In today's digital age, social media platforms have become increasingly influential in shaping public perception. As the reported cases and fatalities rise, social media's role intensifies, often amplifying emotional responses—both positive and negative—among citizens. The

rapid spread of information, whether accurate or misleading, can heighten feelings of fear, anxiety, or complacency, depending on how messages are framed and perceived. This constant influx of reports about high case numbers and deaths contributes to an elevated risk perception, which in turn influences individual behaviors and compliance with health measures (Cuello-Garcia et al., 2020).

The complex interaction between official communications and social media content creates a constantly evolving environment where perceptions are shaped by the tone, credibility, and volume of circulating information. Recognizing how these channels influence public perception is crucial for developing effective risk communication strategies. Such strategies should aim to foster trust, mitigate misinformation, and encourage health-protective behaviors during ongoing and future health crises (Ataguba & Ataguba, 2020; Centers for Disease Control and Prevention, 2002).

The platform's success in engaging the public can be attributed to its effective communication strategy, which emphasizes positive messaging and actively involves diverse age groups. The policy guiding this effort includes maintaining consistency across six social media platforms—ensuring that the same core message is delivered in different formats tailored to each platform. A small team of 1–2 administrators manage these channels, providing regular updates at 06:00 a.m., 11:00 a.m., and as situations evolve. This approach underscores the importance of timely, transparent, and accessible communication (Taisuwan, 2025).

Initially, public perception regarding COVID-19 vaccination among Thai citizens was characterized by high demand, with many believing vaccination was essential even before vaccines were available. However, misinformation about side effects, especially stories claiming severe adverse reactions and deaths, caused significant vaccine hesitancy, leading many to avoid vaccination. Over time, as more information and credible communication campaigns emerged, public confidence gradually increased. The vaccination rate rose from nearly zero at the outset of the campaign to approximately 77.6% of the population receiving at least one dose. This dramatic increase reflects the effectiveness of targeted communication efforts, community engagement, and efforts to counter misinformation. Public perception of preventive behaviors also evolved: awareness of handwashing remained high at around 80%, with some variations in practice; mask-wearing was perceived as important by about 84% when experiencing symptoms, while perception when asymptomatic was slightly lower at around 72%. Adherence to physical distancing was highest at the beginning of the outbreak but decreased over time, with an average adherence rate of about 56%. Meanwhile, perceptions of mask-wearing and handwashing in specific contexts indicate ongoing challenges and the need for continuous education. These dynamics illustrate that effective, transparent, and culturally relevant communication is vital for fostering trust, encouraging preventive behaviors, and increasing vaccine uptake amid an evolving pandemic situation (Taisuwan, 2025; Taisuwan et al., 2018; Tambo et al., 2021).

This study offers valuable insights for healthcare professionals and policymakers aiming to enhance risk communication and health awareness during crises. It highlights several factors that contribute to high engagement levels, notably the role of semi-formal social media interactions that foster a sense of community involvement. Moreover, the introduction of the TRUST concept—encompassing Truth and Transparency, Respect for Audience Diversity, Addressing Uncertainty, Meeting Satisfaction and Support Needs, and Timeliness—serves as a guiding framework for effective communication (Taisuwan et al., 2018).

Key strategies such as simplifying complex data for public understanding and maintaining regular, transparent communication were instrumental in building trust and engagement. The insights from this case underscore the importance of adapting communication strategies to meet the evolving needs of the public during health emergencies, ensuring that messages are credible, relatable, and timely to effectively influence perceptions and behaviors (Tambo et al., 2021).

Conclusion

The effectiveness of many social determinants of health (SDH) in reducing the burden of the COVID-19 pandemic largely depends on effective communication, particularly in crisis and risk communication. Although countries have adopted various communication strategies during the pandemic, successful crisis and risk communication are essential for building trust, credibility, honesty, transparency, and accountability (Ataguba & Ataguba, 2020; Centers for Disease Control and Prevention, 2002). SDH are critical factors influencing health outcomes and inequalities, many of which are outside the direct scope of the health sector. Policies such as social distancing, good hygiene practices, avoiding large gatherings, cancelling social and sporting events, using personal protective equipment, closing schools and restaurants, and implementing country-wide lockdowns are measures promoted to prevent and mitigate COVID-19 transmission—despite not being solely within the health sector.

In times of emergencies and urgent situations, such as the COVID-19 pandemic, social media platforms serve as primary channels for disseminating information, impacting billions of people worldwide. However, these platforms often contain misinformation about the pandemic, which can lead to serious consequences. When used appropriately, social media can be a valuable tool for sharing and accessing relevant information among patients, healthcare providers, and researchers (Cuello-Garcia et al., 2020).

In this study, the success of the TRSC platform described in this case study is attributed to its strategic communication approach, which focuses on positive messaging, consistency across six social media platforms, and regular updates tailored to each channel. A dedicated team of 1–2 administrators ensured timely and reliable dissemination of information, providing updates at 06:00 a.m., 11:00 a.m., and as the situation evolved. This case offers valuable insights for healthcare professionals and policymakers aiming to improve risk communication and enhance public health awareness during crises.

Key factors contributing to high engagement include the adoption of semi-formal social media interactions that foster community involvement and the application of the TRUST framework—covering Truth and Transparency, Respect for Audience Diversity, Addressing Uncertainty, Meeting Satisfaction and Support Needs, and Timeliness. Simplifying complex data for public understanding and ensuring consistent, timely communication were crucial strategies.

The findings underscore the importance of establishing public trust through a combination of formal and semi-formal communication channels, emphasizing the need for two-way interactions. Regular updates and proactive communication of changes are crucial to accurately reflect current conditions. Additionally, providing accessible sources of information—such as hotlines, mobile apps, and social media platforms—allows individuals to seek assistance and remain informed. Overall, tailoring communication strategies to meet public needs during health crises is vital for fostering trust, engagement, and effective

response efforts. Furthermore, global solidarity requires strengthening governance, encouraging community participation, and building trust to enhance early pandemic preparedness and response. Promoting effective risk communication and community engagement (RCCE) interventions necessitates significant improvements in government health systems and proactive security measures, along with fostering community and individual resilience through confinement, trust, and supportive solutions (Taisuwan et al, 2018; Tambo et al., 2021).

Future Research Suggestions

1. Evaluating Long-Term Impact of Social Media Strategies: Future studies could investigate the sustained effects of social media communication on public trust, compliance with health measures, and behavior change over extended periods beyond the initial crisis phase.
2. Comparative Analysis of Communication Platforms: Research could compare the effectiveness of different social media platforms and communication formats (e.g., videos, infographics, live sessions) in enhancing risk perception and engagement among diverse demographic groups.
3. Assessing Behavioral Outcomes: Investigate the direct impact of social media messaging on health-related behaviors, such as vaccination uptake, mask-wearing, and social distancing adherence.
4. Crisis Communication in Future Pandemics: Comparative studies across different health crises can identify best practices and lessons learned to refine risk communication strategies for future pandemics or emergencies.

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Informal Education Development Through Capacity Building With Emphasis on Environmental and Sustainability Behaviour: Case of Pindad Defense Industry Manufacturing, Indonesia

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Abstract

Indonesia is one of the developing countries that focuses on manufacturing industry activities, such as Pindad which is a national defense and security product manufacturing industry. This paper discusses the relationship between informal education through capacity building with the concept of environmental management and sustainability, by conducting Group Interactive Workshop and Periodical Discussion. The fact that there is regeneration age gap, this paper discussed the importance of development of human resources (SDGs 4), especially millennials who are the driving force in managing environmental impact from manufacturing activities. Therefore, it has considered urgent to accelerate the knowledge improvement for better environmental performances. The results shows that more than 40 millennials with an approximately gender balance of 50:50 (SDGs 5) have participated in capacity building activities in the field of integrated environmental management knowledge of production activities consisting of several production divisions (SDGs 9), including the Special Vehicle Division, Weapons Division, Heavy Equipment Division, and Infrastructure and Service Infrastructure Division. From this activity, innovations were produced in related fields with emission reduction results of 16.9 tons of CO_2-eq (SDGs 13), reduction in wastewater load of 0.0014 tons of TSS (SDGs 14), 3R of Solid Waste of 215 tons of scrap (SDGs 12), and 3R of Hazardous Waste of 0.64 tons of paint dust (SDGs 12). This paper also discussed the contribution of the authors as leaders (SDGs 17) in each environmental stream plays a key role in maintaining the knowledge update to each production division, aligning with sustainability.

Keywords: defense industry, capacity building, sustainable development goals

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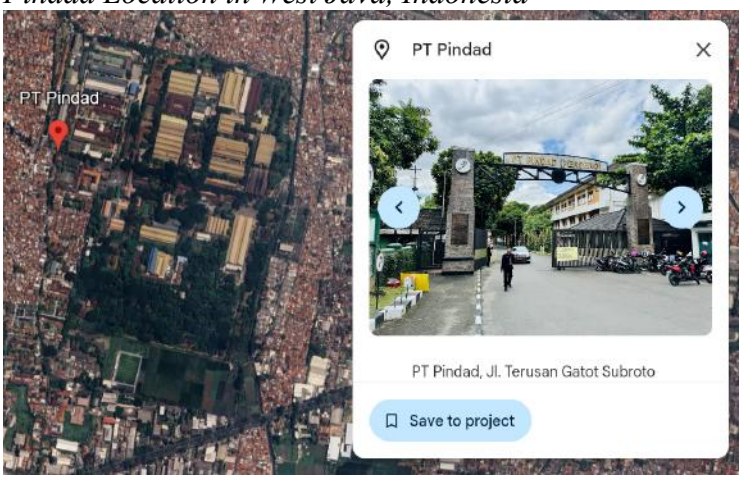
Introduction

PT Pindad is a strategic state-owned enterprise in Indonesia engaged in manufacturing defence and commercial products (Pindad, 2025). With facilities located in West and East Java, the company serves as a vital arm of Indonesia's defence industry (see Figure 1). However, in response to increasing global concern over environmental degradation and climate change, Pindad recognized the urgent need to embed sustainability principles into its operational culture.

Figure 1
Pindad Location in West Java, Indonesia



This initiative takes a progressive stance by targeting millennials—a demographic that constitutes a significant portion of Pindad's workforce. It addresses generational gaps in environmental literacy and utilizes informal education as a tool for empowering workers. The informal approach allows for a more adaptive, collaborative, and interactive environment for learning, breaking away from rigid formal training structures.

This study evaluates the impact of such an initiative on environmental performance and workforce engagement by emphasizing the synergy between environmental innovation and human capital development aligned with the United Nations Sustainable Development Goals (UN SDGs).

Literature Review

Capacity building and informal education have been increasingly recognized as effective strategies for advancing sustainability, especially in industrial sectors (Gunningham et al., 2003). According to UNESCO (2018), informal education can complement formal training by leveraging peer learning, experiential activities, and on-the-job exposure. Within corporate settings, this often manifests in knowledge-sharing workshops, periodical discussions, innovation hubs, and community-of-practice models.

In the defence industry, environmental performance has traditionally taken a backseat to operational efficiency and national security concerns (Permatasari et al., 2022). However, studies by the International Journal of Environmental Research (2020) note that sustainability practices, when institutionalized, do not hinder productivity but rather promote innovation and cost savings.

Moreover, the intergenerational dynamics of workforce transformation—particularly engaging millennials—have emerged as a crucial aspect of organizational learning. Millennials tend to be more environmentally conscious and technologically adept, making them ideal agents of change in industries seeking sustainable transition (PwC, 2021).

Methods

This study uses a combined-methodological approach using quantitative environmental metrics and qualitative assessments of employee participation and innovation outcomes. Key components of the program included:

- **Interactive Workshops**: Held monthly, involving case studies, role-playing, and problem-solving tasks related to environmental scenarios.
- **Thematic Discussions**: Conducted weekly and biweekly, focusing on specific sustainability topics such as emission control, energy audits, and waste segregation.
- **Division-based Projects**: Participants were grouped according to their operational divisions and tasked with proposing and implementing at least one green innovation.

Data collection tools included attendance records, innovation logs, internal audit reports, pre- and post-activity surveys, and interviews with environmental coordinators. Impact was measured over a 12-month period (2024–2025).

Results and Discussion

The results of the program are categorized into three main impact areas: environmental performance, employee capacity, and organizational innovation.

Environmental Performance

- **Energy Efficiency**: A comprehensive energy audit led to the identification of inefficient equipment and improved scheduling of machine operations. This saved 7,843 GJ of energy and approximately $15,500 in electricity costs. (see Figure 2)

Figure 2

Operational Activities Embedded With Energy Efficiency Program

Source. Herliani et al. (2024)

- **Emission Reduction**: Process innovations reduced carbon emissions by 16.9 tons of CO2-equivalent. (see Figure 3)

Figure 3

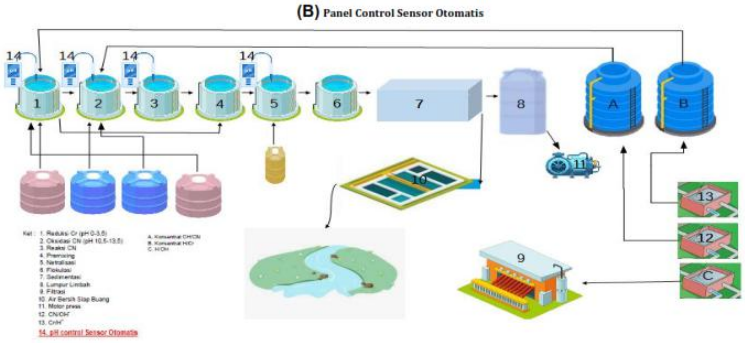
Cleaner Production Based Emission Reduction Program Developed by Pindad

Source. Ritaudin et al. (2024)

- **Water Management**: Installation of an RO-based water recycling system allowed 60% of wastewater from testing units to be reused. This resulted in a decrease of 0.0014 tons of TSS. (see Figure 4)

Figure 4

Reverse Osmosis Innovation Technology for Wastewater Treatment



Source: Arafat et al. (2024)

- **Solid Waste**: A 3R approach applied across four production units processed 215 tons of metal scrap for reuse and recycling. (see Figure 5)

Figure 5

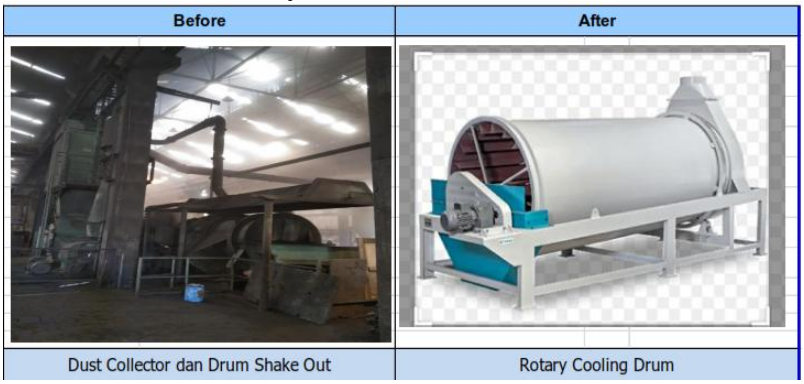
Metal Scrap Utilization for Product Optimization

Source. Permadi et al. (2024)

- **Hazardous Waste**: Development of localized paint-dust collectors minimized 0.64 tons of hazardous waste from painting booth process. (see Figure 6)

Figure 6

Paint-Dust Collectors for Hazardous Waste Minimization



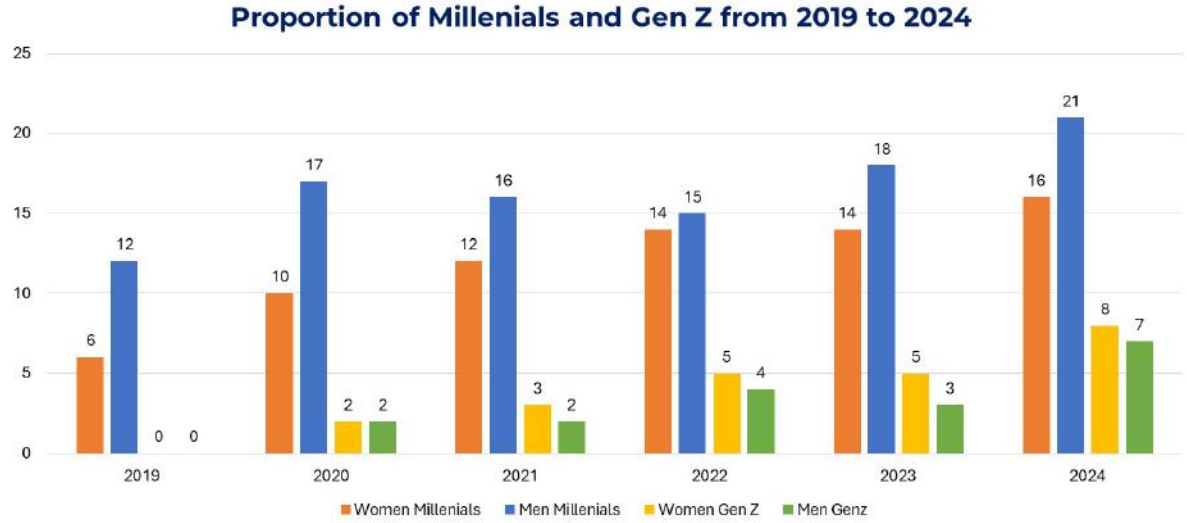
Source. Dewantara et al. (2024)

Human Capital Development

Participation rates remained above 85-90% across all events. Informal education improved baseline knowledge scores by 50-80% (measured through pre-and post-activity quizzes). Feedback indicated strong interest in practical, hands-on learning methods. Importantly, millennial participants expressed increased motivation and ownership of environmental goals, identifying strongly with company values and SDG alignment. As this paper focusing on the activities and the proportion of youth generation, here is the proportion of each champion participants as depicted in Figure 7.

Figure 7

Proportion of Millennials and Gen-Z Involvement in Capacity Building Activities



Source. Roshaliha et al. (2025)

The graph illustrates a notable rise in the participation of millennials and Gen Z individuals over the period from 2019 to 2024. The data also reveals a balanced growth in participation between female and male employees, underscoring Pindad's commitment to sustainability and equality in its capacity-building initiatives. Going forward, we expect this initiative to be

implemented optimally, yielding meaningful benefits for the younger generation in the manufacturing sector.

Innovation and Knowledge Sharing

Here are several new internal innovations were submitted for intellectual property protection, including:

- Portable of Dust Suction Devices and Painting Dust Collectors
- Innovation of Shoulder in the E-Clip Railway Rail Fastening System
- 3R Multi Production Division: Automation of Water Treatment and Distribution Processes to Recycle Water for Rain Testing
- Reuse of Wastewater Effluent with Reverse Osmosis (RO) Mechanism

One of capacity capacity-building activity is depicted in Figure 8.

Figure 8
Capacity Building Activity in Strengthening Environmental Sustainability

Source. Kristina et al. (2024)

Knowledge-sharing mechanisms such as online platform/ digital bulletin boards and peer-led tutorial videos were introduced. These tools enabled rapid dissemination of best practices and reinforced a collaborative learning environment.

Organizational Impact

Beyond individual capacity, the program fostered a broader cultural shift. Management began to prioritize environmental metrics in strategic decisions, and sustainability indicators were incorporated into performance reviews. Environmental compliance scores improved during external audits, and the program received recognition from the Indonesian Ministry of Environment and Forestry for innovative environmental education in manufacturing industry. Pindad's sustainability efforts were recognized by national institutions and organizations during the same year as depicted in Figure 9.

Figure 9
BUMN Track and Indonesian Shared Value Institute (ISVI) 2024

Source. Pindad (2024)

Pindad received a prestigious 4-star (Gold) award in the Social Pillar category at the 4th TJSL & CSR Award 2024, presented by BUMN Track and Indonesian Shared Value Institute (ISVI), in recognition of its outstanding social responsibility initiatives.

Challenges and Limitations

These activities and initiatives, however, also having challenges and limitations so far, such as:

- **Sustainability of Engagement**: Maintaining interest beyond the pilot phase is a concern. Strategies such as gamification and recognition awards are under consideration.
- **Integration with Formal Systems**: Informal efforts need to be institutionalized to ensure long-term continuity.
- **Resource Constraints**: Initial implementation required upfront investment in training materials, devices, facilitation, etc.

Conclusion

We conclude some points, they are:

- The capacity-building initiative at Pindad demonstrates that informal education can be a powerful lever for environmental sustainability in the industrial sector. It successfully addressed the generational knowledge gap, empowered young employees, and achieved measurable improvements in energy, waste, and emission metrics.
- The program proves that sustainability and productivity can coexist through education and innovation. By harnessing the creativity and values of the millennial workforce, companies like Pindad can lead the transition toward more sustainable industrial practices.

Recommendations

The are also some of recommendations we would like to follow up in the future, such as:

- Scale the program to reach more employees across divisions and ranks.
- Establish a Sustainability Learning Center to house training modules and serve as a think-tank.

- Formalize links between informal learning outputs and company KPIs.
- Collaborate with external educational institutions and NGOs for content enrichment.
- Conduct longitudinal studies to track long-term behavioural and environmental impacts.

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Collaborative Research Narratives in Counselling

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Abstract

This paper examines the collaborative reflective process between the research supervisor and the student researcher. Using a descriptive analysis approach, we found that this process can involve critically thinking through the personal or client narrative that the student may want to plan to explore in research, then acting on this plan with participants to find common community narratives, using reflective practices to develop into appropriate themes for critical discussion in the research findings. This collaborative reflective process between student and research supervisor could be called collaborative research narratives. Thus, building upon co-operative inquiry principles of collaborative and reflective critical thinking, action research cycles, and narrative inquiry, we explore the concept of enhanced community narratives through the collaborative process of supervision for enriched social research. We contribute to the literature in three ways. First by examining existing literature on research supervision and the current landscape and knowledge in the field. Second, we align reflective process as a key element of supervisor and provide evidence of research outcomes consistent with reflective processes. Third, this paper proposes collaborative research narratives as pertinent to student supervision.

Keywords: collaborative research narratives, supervision, higher degree research, reflective practice, psychotherapy, counselling

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Introduction

Counselling supervision of research students, involves a collaborative reflective process, where the supervisor engages with the student to plan their research by finding a worthwhile issue of concern that resonates with their own identity narrative (McAdams, 1997, 2019) or narratives from their community work with clients, in order to explore with research participants, an enhanced collective narrative (Rappaport, 2000) that might benefit the community.

Using a descriptive analysis methodology, this paper identifies socially critical phenomena and, in doing so, answers questions about who, what, where and to what extent (Loeb et al., 2017). The method of analysis proposed is the descriptive narrative as the questions to be answered are transposed into this article to discuss research supervision (who) in counselling (what) in education settings (where) for student progression (to what extent).

Building upon co-operative inquiry principles of collaborative and reflective critical thinking, action research cycles, and narrative inquiry, we explore the concept of enhanced community narratives through the collaborative process of supervision for enriched social research.

We contribute to the literature in three ways. First by examining existing research on Higher Degree by Research (HDR) supervision and the current landscape and knowledge in the field. Second, we align reflective process as a key element of HDR supervisor and provide evidence of research outcomes consistent with reflective processes. Third, this paper proposes collaborative research narratives as pertinent to HDR supervision.

Research Supervision Overview

An overview of research supervision in counselling indicates that HDR supervision is multifaceted. For instance, Lee (2019) examined different conceptual approaches to supervising and teaching research students. Using a teaching and learning framework the author categorised research supervision into five stages:

1. **Functional**: Focusing on project management
2. **Enculturation**: Student focus is on joining a disciplinary community
3. **Critical thinking**: Here the student focus is analysing own work
4. **Emancipation**: The student has autonomy to self-develop and question their work
5. **Developing a quality relationship**: The relationship with the supervisor is nurtured, reciprocal and the student feels heard and cared for

However, Lee (2019, pp 33) critiqued her own framework describing it as “offering a tidy reconciliation of a process which is undeniably messy and individual”. Lee’s research provides an excellent but broad view of academic supervision. Although relevant to the current study, we find that there is potential for a more relatable framework for psychotherapy and counselling research supervision.

Similarly, Maxwell and Smyth (2010) argued for a research management matrix based on their work on three core themes in HDR supervision: learning and teaching process; developing the student; and producing the research project/outcome as a social practice. They theorised that a research management matrix provides opportunity to manage the research student’s time, milestones and relationships. However, although efficient, this framework

focuses on student completions. We suggest that in the field of counselling and psychotherapy a more collaborative and reflective framework may be considered.

Bager-Charleson et al. (2021) conducted psychotherapy and counselling research supervision using a range of approaches. These included survey, interviews and free response to collect data. The authors examined constructive and non-constructive HDR supervision within the counselling profession. Supervisors and supervisees reportedly reflected on what each had learned from the supervision experience. According to the supervisees, trust, knowledge and containment are important concepts within this process. Supervisors also shared similar views. Interestingly the researchers found that supervisees reportedly valued research experience, empathy and containment. They argued that a research supervision model for counselling psychotherapy programs should be relational in nature, based on containment, compassion and clarity (Bager-Charleson & McBeath, 2022).

de Kleijn et al. (2015) interviewed higher degree research supervisors, they were asked to consider students' characteristics and its alignment to specific needs, including research supervision strategies. This approach suggests that students are supported based on the supervisor's assessment of the supervisee. The authors argued that supervision strategies are "adapted" to specific students' needs. They concluded that the supervisors have a big part in gauging their student's capacity to complete the research thesis. This indicates that the role of the supervisor is quite broad and complex with an overarching requirement to remain adaptable.

Collaborative Reflective Supervision

The research process needs to be collaborative. A collaborative process between the research student and the supervisor, who plan and reflect the research together, to in turn, collaborate with participants in the research process to develop new understandings on the topic of interest.

Thus, the supervisor needs to provide a role model of a collaborative approach with the student, by engaging in reflective practices with the student, showing integrity and respect, as really a form of specialist teaching. Firth and Martens (2008) argue that supervision is a specialist form of "teaching" complete with its own institutional roles and responsibilities.

Supervision is a sophisticated, high-level teaching process in which learning is central. The model used, the supervisors' relationships and the experiences form the basis for reflection process connected to, among others, communication theory and social-psychological explanatory models. Emilsson and Johnsson (2007) argue that the five requirements of supervising research students, were: trust, theories, tools, training and time. Allen et al. (2020), also argued for the importance of supportive supervision describing this as proactive with a focus on increasing positive behaviours.

Other research within the field of medicine found that students expect their research supervisors to be knowledgeable, approachable, reasonable and supportive (Yousof et al., 2019). Meanwhile, the supervisor will expect their research students to be able to: work autonomously, be critical thinkers, who are enthusiastic, motivated, sociable and have the mastery of purpose (Yousuf et al., 2019).

Adams (2017), emphasised the importance of the supervisor in the research process, to encourage cycles of planning and reflection, in his workshops which focussed on de-mystifying a research thesis.

Reflective Process

Supervision in counselling psychotherapy may occur using a reflective practice framework.

Schon's (1983) notion of reflective practice, entails thinking about our actions critically to help improve practice. The emphasis is on the need to move towards a more inquiring, social and reflective approach to problems. A reflective approach in HDR supervision ideally aligns with using reflective processes. The goal is to move towards a more inquiring, social and insightful approach to problems, using facets of theoretical approaches within reflective practice, such as framing and reframing.

Drawing on Schon's theory we outline three relevant steps. The first step is the development of the idea of "thinking before and while doing" (Parsons, 2009). This step introduces HDR supervisor and supervisee activities as well as giving support to individual research skills. The second stage encourages reflection through the lens of self and others (Brookfield, 1995). The final stage is the reflective process employed to assist all parties in the supervision process reach the desired outcome using critically reflective models (Thompson & Thompson, 2023).

In the first step the aim is to encourage the HDR candidate to approach their research as independent thinkers. Galea (2012) pointed out this approach may lead to autonomous learning.

Step two focuses on the role of the supervisor and the supervisee and the assessment of new approaches to improving the HDR training experience for all parties. Brookfield (1998) suggested that the reflective process include the use of specific lenses—those of learners, colleagues and researchers in addition to our own individual autobiographies—to form a critically review.

Within a reflective process the third stage focuses on the importance of the roles of peers, supervisors and autobiographical reports for the critically reflective practitioner (Knowles et al., 2007). Significantly, the review process may vary from institution to institution. However, the commonality is that all HDR candidature have to go through specific milestones and reviews for the tenure of their research program.

The emphasis of the reflective process is on the active reflection on action as they happen within this context the research student explores a suitable topic of interest with the supervisor, that is meaningful to the student and of some value to the broader community. The student and supervisor engage in a continuous reflective process, with each step of the research, in an active research cycle, of planning, acting and reflection. Thus, supervision is not a solitary endeavour, rather a social and collaborative process that takes place within dynamic and complex contexts.

Collaborative Action Research Cycle

A social research methods approach uses action research cycle, with spiral steps, first developed by Lewin (1946). The action research cycle involves continuous spirals of planning, action, and reflection. Hence, the supervisor supports the research student to plan the research, act to conduct an appropriate research method, and reflect on the findings to explore common themes, community narratives (Rappaport, 1995).

Bradbury and Reason (2003) have explored in depth, the underlying principles of action research as: grounded in lived experience; developed in partnership; addressing significant problems; working with, rather than simply studying, people; developing new ways of seeing/theorising the world and leaving infrastructure in its wake (Dick, 2023).

Collaborative Planning of Meaningful Narrative

The supervisor critically explores with the student a meaningful narrative of interest, with a critical thinking lens. The social research process in about being curious about your topic of interest, in conversation between the supervisor and student, with critical thinking, not just the banking of knowledge (Freire, 1970).

This collaborative process is a form of co-operative inquiry, according to Heron and Reason (2001), who describe the research process as working "with" rather than "on" people. We work with people who have similar concerns and interests to ourselves, in order to: understand your world, make sense of your life and develop new and creative ways of looking at things and learn how to act to change things you may want to change and find out how to do things better. Jackson (2001) proposes that the critical thinking model works through three stages: problematising; finding connections; and uncovering perceptions / the shape of the answer.

Firebaugh (2008) proposes seven rules of social research: there should be the possibility of surprise in social research; look for differences that make a difference, and report them; build reality checks into your research; replicate where possible; compare like with like; use panel data to study individual change and repeated cross-section data to study social change; and let method be the servant, not the master.

The supervisor encourages the student to develop a research topic around a personal narrative or phenomena from their own lived experience or from the personal narratives or case studies, from their clients or their own previous research. Discovering our own life narratives of self-identity is an important part of our own personal growth (McAdams, 1997, 2019).

Incidentally, this concept of people seeking to understand their life narratives, has also been developed into a strength-based counselling approach (White, 2007).

Social research is about exploring our own life narratives and the personal narratives of others, to develop a further understanding of our topic. Gair and van Luyn (2017) argue that the focus is on hearing and amplifying narratives.

Social research is undertaken to develop more meaningful understanding of our lives, our mental health and sense of wellbeing. According to Tracy (2010): high quality qualitative methodological research is marked by (a) worthy topic, (b) rich rigor, (c) sincerity, (d)

credibility, (e) resonance, (f) significant contribution, (g) ethics, and (h) meaningful coherence (Tracy, 2010, as cited in Denzin & Lincoln, 2018).

Denzin and Lincoln (2018) argued that qualitative research involves an interpretive and naturalistic approach leading to a process of "making meaning".

Collaborative Action With Participants for Formation of Narratives

Social research can take particular forms to find the narratives or particular phenomena of interest for research. Creswell and Poth (2018) explore the philosophical underpinnings, history, and key elements of five qualitative inquiry approaches: narrative research, phenomenology, grounded theory, ethnography and case study.

Hermeneutic phenomenology, also known as interpretive phenomenology, originates from the work of Martin Heidegger (Neubauer et al., 2019) who explored the concept of human beings as actors (Lopez & Willis, 2004).

Hermeneutic phenomenology (Laverty, 2003; Reiners, 2012), then, seeks "to understand the deeper layers of human experience that lay obscured beneath surface awareness and how the individual's lifeworld, or the world as he or she pre-reflectively experiences it, influences this experience" (Bynum & Varpio, 2018). Hermeneutic phenomenology studies individuals' narratives to understand what those individuals experience in their daily lives, in their lifeworlds (Neubauer et al., 2019).

In sociology, and other social science disciplines (e.g., psychology, anthropology, communication, education), narrative inquiry was an outcome of social constructionism, developed by Berger and Luckmann (1966), which presented lived experience as a social epistemology stemming from shared meanings (Wolgemuth & Agosto, 2019). These shared narratives of meaning, that are researched and evaluated can be transformative (Mertens, 2009). Wolgemuth and Agosto (2019) stated that bringing these unheard stories to light is relevant to our work.

Mishler (1986) introduced narrative as a central mode of human cognition that offers insight into individual and collective identity and experience. The narrative turn signalled academics' attunement to the importance of story and the belief that people's lives are forged through stories.

Collaborating in supervision with the student for a research narrative cycle. Hence described as narratological devices of plot, point of view, authorial distance, and character, and examine how these concepts can be used when writing with qualitative data (Holley & Colyar, 2012).

In research supervision, we work with the student, planning and reflecting on a topic that relates to their own narrative or client work narratives or a community concern narrative, to find common community narratives to improve our counselling practices in the community. Connelly and Clandinin (1990), describe our lives as storied. Stories embody knowledge accumulated and experience gained over time. Narrative inquiry is one way of making sense of that knowledge and experience (Bruce et al., 2016). Nasheeda and colleagues explore the narrative analysis concept as important stories from our past and present leading to narrative analysis (Nasheeda et al., 2019).

Co-creating stories with study participants allows the researcher to live alongside the participant and listen to their stories (Nasheeda et al., 2019). Butina (2015) also defines the narrative research approach as collaborative in nature (Butina, 2015).

Collaborative Reflection for Community Narratives

In social research, there can be a collaboration with community member participants, to find common community narratives of concern, and perhaps explore ways to support community members with appropriate counselling, for ways forward. Rappaport (1995) developed the concepts of empowerment and community narratives, especially in his article on community narratives (Rappaport, 2000).

Harper et al. (2004) describe a theoretical framework of personal and social change initiated through the use of community narratives. Narrative theory and its components, including description and critical analysis of community and setting narratives, dominant cultural narratives, and personal stories are defined, and the art of storytelling in research is described (see also Bruce et al., 2016).

Short and Healy (2017) in writing about co-operative inquiry, speak of writing "with" research participants, not "about" them, and becoming immersed in the topic as a touchstone of co-operative inquiry methodology. That is, people are attentive to themselves, their beliefs, their own lens, their practice and their intuitions and actions, and engaging in a process of critically evaluating them (Heron & Reason, 2001).

Wadsworth (2011), has undertaken social research to find the community narratives, as described in her work. Wadsworth was one of the first to be involved with a team doing social research with mental health patients in Royal Park in the 80s, rather than previous researchers who only questioned the doctors and nurses, the caregivers. It was important to hear about the lived experience of the patients themselves. (Wadsworth & Epstein, 1998).

One of the authors' Julie Morsillo, in her PhD research using community-based participatory action research (Duijs et al., 2019; Wallerstein, 2020), to explore with groups of vulnerable youth, ways for them to strengthen their positive identity narrative and find a voice in collaborating with local communities with creative projects to make meaningful connections (Morsillo, 2003, 2004; Morsillo & Fisher, 2007, 2009; Morsillo & Prilleltensky, 2007).

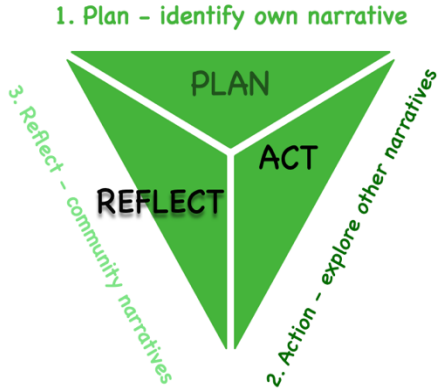
Thus, the importance of collaboration of the researcher with community members for rich qualitative research drawing out personal and community narratives, has been shown in research over the last few decades. So perhaps these concepts could be applied to the collaboration between the research supervisor and the research student, to: plan a personal narrative of importance for research; to then act together to explore the concept with research participants: in order to find and reflect upon the themes of common community narratives.

Narrative Research Cycle

This collaboration process or cycle, of the supervisor with the research student, to plan the personal narrative for research, and considering action together to explore with participants, and reflect upon common community narratives, could be framed as a narrative research cycle, of: plan, act and reflect (see Figure 1).

1. **PLAN a narrative** to explore collaboratively with the student for an inspiring narrative or **super vision** - a vision of a topic of interest and relevance to explore with appropriate participants.
2. **ACT of find more narratives,** where the student collaborates with participants to develop a comprehensive narrative with inter-views to inter-relate with relevant participants with lived experience or practitioners working with lived experience to explore different view-points.
3. **REFLECT to understand** the common **community narratives,** by exploring the themes with the student, to collate rich data from participants to find immersive appropriate themes, overall concerns or interests, and related or unrelated sub-themes that inter-relate to make sense of the data, to promote more knowledge and understandings of the issue.

Figure 1
Narrative Research Cycle



Conclusion

This paper has sought to show the importance of a collaborative reflective process between the research supervisor and the student researcher. This process can involve critically thinking through the personal or client narrative that the student may want to plan to explore in research, then acting on this plan with participants to find common community narratives, using reflective practices to develop into appropriate themes for critical discussion in the research findings.

This narrative research cycle can be a spiral of reflective cycles, when the student collaborates with the supervisor, to continually engage in planning the next phase of the research, followed by acting on that plan and then reflecting on the plan in that particular phase of the research. The phases of developing the topic, of working on the method, the ethics proposal, developing the findings themes, and writing up the paper. So the final cycle of writing the research paper, should have a clear informed meaningful topic narrative, with the method of action with participants to reflectively explore any common community narratives, and critically discuss these themes with a relevant conclusion.

This concept of research supervisor working reflectively and collaboratively with the student to find and explore the personal narrative to form common community narratives, in a narrative research cycle, based on the action research cycle, may be a helpful reflective way of viewing the research supervision process.

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Synonyms of *Basar* in Sahih Bukhari

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Abstract

Synonymy, while generally understood as words with similar meanings, often carries subtle connotations that reflect deeper linguistic and semantic layers, highlighting the significance of specific terms within a language. Although much research on synonymy focuses on translation between languages, the study of synonyms in Prophetic sayings remains underexplored. This study investigates the synonyms of the word *basara* in Sahih Bukhari, seeking to uncover its semantic depth and linguistic nuances. The term *basara* and its related expressions encompass diverse meanings, ranging from physical vision to metaphorical insight. However, while *basara* is often used interchangeably with other terms, its precise connotations and contextual variations have not been thoroughly analyzed. This research identifies the synonyms of *basara* within selected Hadiths, examines their contextual applications, and analyzes their denotative and connotative meanings. Employing a qualitative approach rooted in corpus analysis, the study systematically explores occurrences of *basara* and its synonyms in Sahih Bukhari. Findings reveal that *basara* is synonymous with terms such as *ra'a*, *nazara*, and *shahida*. Each synonym, however, displays unique nuances depending on the thematic and situational context of the Hadith. For example, *ra'a* primarily denotes visual perception, while nazara often signifies deliberate contemplation. These results highlight the intricate semantic layers of Arabic and the stylistic precision of Prophetic speech. The study's findings provide valuable insights into the linguistic and interpretive frameworks of Quranic and Hadith studies, contributing to a deeper understanding of Arabic semantics and enriching Islamic scholarship.

Keywords: synonymy, Hadith, semantics, Sahih Bukhari, lexical variation

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Introduction

Synonymy, a fundamental concept in semantic field theory, explores how words with similar core meanings differ in nuance, connotation, and contextual usage. In Arabic, the phenomenon of synonymy (*tarāduf*) reflects the language's lexical richness and stylistic depth, particularly within classical and religious texts. Classical scholars such as Sibawayh and Ibn Fāris debated the existence of true synonyms, often arguing that each term carries a distinct semantic value shaped by its contextual deployment (Osman Mohamed Gharib, 2015). This distinction is especially crucial in Islamic texts, where linguistic precision serves theological, legal, and rhetorical purposes. The Quran, for instance, exhibits deliberate variation in word choice, which contributes to both stylistic elegance and interpretive depth. Similarly, the Hadith literature that comprising the sayings, actions, and approvals of the Prophet Muhammad (peace be upon him) relies on carefully chosen vocabulary to convey complex layers of meaning, often through synonymous expressions (Brown, 2009).

Despite the well-documented use of synonymy in the Quran, its occurrence in Hadith literature remains under examined. While some studies have addressed lexical variation in Prophetic speech, there has been little focused attention on how synonymous terms function within specific semantic fields. A particularly overlooked area is the use of the term *basar* (بصر, sight/vision) and its near-synonyms such as *ra'a* (رأى), *nazara* (نظر), and *shahida* (شهد) in Sahih Bukhari, one of the most authoritative collections of Hadith. These words, though often translated similarly, differ significantly in usage: ra'a typically denotes physical seeing, nazara implies deliberate observation, and shahida involves bearing witness, often with legal or eschatological overtones. Yet the interpretive implications of such variations have not been systematically explored within Hadith studies.

This study seeks to address this gap by examining the usage of *basar* and its synonyms in Sahih Bukhari, with the aim of clarifying their contextual meanings and functional distinctions. Through qualitative semantic analysis and close reading of selected Hadiths, the research investigates how each term is employed to convey different modes of perception, ranging from sensory experience to intellectual reflection and legal testimony. The study reveals that the Prophet's linguistic choices are far from arbitrary; rather, they serve to guide the audience's understanding with theological and ethical precision. By uncovering the semantic depth and interpretive function of synonymy in Prophetic sayings, this research contributes to Arabic linguistic scholarship and enhances the methodological tools available to scholars of Hadith and Islamic theology.

Literature Review

Synonymy, a cornerstone of semantic-field theory, describes the relationship between lexical items that share a core meaning yet diverge in connotation, stylistic register, or pragmatic scope. Kamus Dewan (2013) illustrates this subtlety in Malay: *basah* and *lembap* both denote wet, yet only *basah* fits meteorological contexts (*jalan itu basah selepas hujan*), whereas *lembap* suits humidity substances (*baju itu masih lembap*). Even metaphorically, *lembap* can signal slow, underscoring how context selects among near-equivalents.

The term synonym originates from Greek (syn "together" + onoma "name") and entered modern linguistics via Latin and French. Western and Malay scholars like Verhaar (1978), Asmah (1982), and Lyons (1995) concur that perfect interchangeability is almost non-existent; most synonyms are merely proximate. Classical Arabic philologists sharpened this

debate: Sibawayh and Fakhr al-Dīn al-Rāzī defended true synonymy (*tarāduf*), while Ibn Fāris and Thaʿlab rejected it, insisting each lexical form carries an exclusive semantic hue.

Multiple forces generate synonym sets. Dialectal divergence yields pairs such as American bus versus British coach; borrowing introduces doublets like Malay *kereta* and *motokar*; social register distinguishes *wafat* (prophets' demise) from *mangkat* (royal passing). Metaphorical extension, phonological drift, and descriptive epithets further diversify vocabularies: Arabic offers *al-manzil*, *ad-dār*, and *al-maskan* that indicate "house," yet each coloured by historical nuance or functional emphasis (Norfarhana Ahmad Ghafar & Hishomudin Ahmad, 2023).

If synonymy displays the language's semantic precision, Ṣaḥīḥ al-Bukhārī exemplifies methodological rigour. Imam Muḥammad ibn Ismāʿīl al-Bukhārī (194–256 H) sifted roughly 600,000 reports over sixteen years, accepting some 7,563 narrations (about 2,600 without repetition) that satisfied his stringent criteria: unbroken chains of trustworthy transmitters, freedom from hidden flaws, and textual consistency (Al-Bukhari, 1980).

Structured into ninety-seven books, Ṣaḥīḥ al-Bukhārī opens with "The Revelation" and closes with "Monotheism," spanning creed, ritual, commerce, ethics, history, and the Prophet's biography. Its meticulous architecture where its combined with unrivalled scrutiny of transmitters has secures its rank, in Sunni scholarship, as the most reliable work after the Qurʾān (Lucas, 2004). Thus, while synonymy illuminates Arabic's expressive breadth, Ṣaḥīḥ al-Bukhārī anchors that breadth in authenticated Prophetic discourse, guiding both academic inquiry and daily Muslim practice.

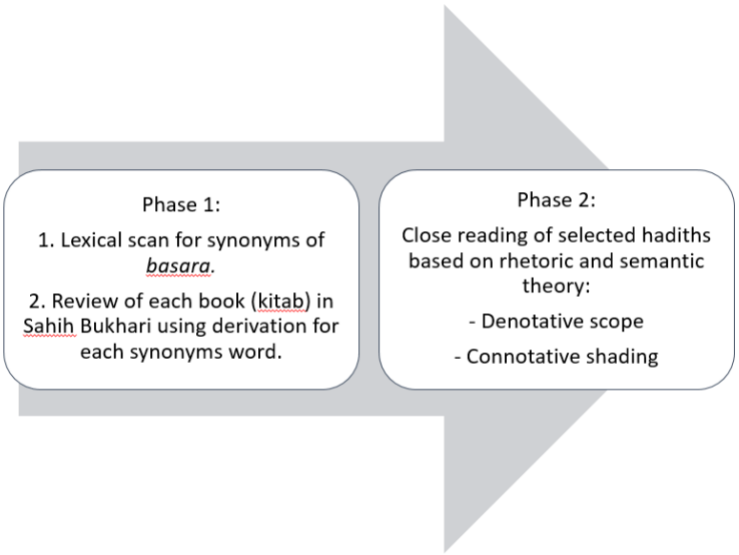
Building on earlier discussions of synonymy in Ṣaḥīḥ al-Bukhārī, recent work has mapped the denotative and connotative profiles of he verb naẓara (**نظر**), often rendered as "to look," demonstrates a semantic spectrum extending from physical sight to spiritual contemplation, deep reasoning, and even nominative use, as documented in 65 usages across 43 Hadiths in 27 books of Ṣaḥīḥ al-Bukhārī (Norfarhana Ahmad Ghafar et al., 2025). Similarly, the term baṣar (**بصر**) and its derivatives, examined in a parallel study, encompass not only literal vision but also theological depth, such as inner insight, epistemic awareness, and divine attributes, found in 17 Hadiths and classified into eyesight, spiritual perception, and symbolic referents (Norfarhana Ahmad Ghafar et al., 2024).

Through a two-phase qualitative design; textual extraction followed by semantic categorisation, the study shows that while the literal sense "to look/see" dominates, nearly half the occurrences function metaphorically, signalling inner vision, critical reflection, or the absence of divine mercy. This layered pattern confirms that Prophetic diction deploys ostensibly synonymous verbs with great precision, allowing a single lexical root to index multiple epistemic stances and ethical cues depending on context, thereby enriching exegetical depth and underscoring the need for semantic sensitivity when interpreting Hadith discourse.

Methodology

This study employs a qualitative, text-analytical design centred on Ṣaḥīḥ al-Bukhārī, selected for its canonical authority and lexical breadth in Prophetic discourse. The investigation proceeds in two sequential yet interdependent stages, defined as Phase 1 and Phase 2, as shown in Figure 1.

Figure 1
Two Phases in of Analysis



Phase 1 – Data Identification and Extraction

An initial lexical scan isolated candidate verbs synonymous with baṣara (**بصر**, "to see/perceive"). Drawing on classical Arabic dictionaries and modern lexicographic sources, three principal equivalents were established: raʾā (**رأى**), naẓara (**نظر**), and shahida (**شهد**). Using these criteria, each book (kitāb) of Ṣaḥīḥ al-Bukhārī was systematically reviewed and extracted.

Phase 2 – Contextual-Semantic Analysis

The selected narrations were then subjected to close reading informed by traditional Arabic rhetoric and contemporary semantic theory. For each synonym, the analysis traced:

a) Denotative scope – the baseline meaning (e.g., physical sight vs. judicial witnessing);
b) Connotative shading – emotive or evaluative overtones triggered by co-text.

Result and Discussion

This study classifies the Hadiths containing synonyms of *basar* into two distinct categories based on the number of synonymous terms present within each narration. The first category consists of Hadiths featuring pairs of synonymous words, accounting for twenty-five instances. The second category includes Hadiths in which three synonymous terms appear together within a single narration, with a total of three such occurrences identified.

Table 1
The Pair of Synonyms

Word and its synonym	Count
بصر – رأى	1
بصر – نظر	1
شهد – رأى	7
شهد – نظر	4
رأى – نظر	12
TOTAL	25

Table 1 indicates that the most frequently occurring synonym pair is raʾā (رأى) and naẓara (نظر), which appears in twelve Hadiths, reflecting a strong semantic affinity between the two terms. The pairing of raʾā with shahida (شهد) follows, with seven occurrences, while naẓara and shahida appear together in four instances. Less frequently, raʾā is paired with baṣara (بصر), and naẓara with baṣara, each combination occurring only once. These Hadiths are distributed across a wide range of thematic categories in Ṣaḥīḥ al-Bukhārī, including acts of worship, ethical conduct, interpersonal relations, prophetic narratives, and core theological concepts—underscoring both the linguistic versatility and interpretive depth of these synonymous expressions.

For example, in Hadith number 7047 from Sahih Bukhari, a nuanced semantic interplay between baṣara (بصر, insight) and raʾā (رأى, sight) is evident within the context of prophetic dream interpretation (Shihab al-Din Abi al-Abbas Ahmad Muhammad as-Syafi'e al-Qastalani, 1996). The narration recounts a dream experienced by Prophet Muhammad (peace be upon him), in which he witnesses individuals receiving recompense based on their earthly actions. Here, raʾā denotes immediate sensory perception, reflecting the vivid visual elements of the dream, while baṣara signifies a deeper, interpretive understanding that allows the Prophet to grasp the symbolic and moral implications embedded within the vision. This distinction underscores the dual nature of true dreams (*ruʾyā*) in Islamic thought—recognized as one of the forty-six parts of prophecy (Al-Qaradawi, 2000)—which require both external observation and internal discernment. The interplay of raʾā and baṣara thus illustrates the harmonious relationship between literal seeing and spiritual insight, both of which are essential for decoding divine communication and extracting ethical meaning from prophetic experiences.

Table 2
The Triplet of Synonyms

Word and its synonym	Count
بصر – رأى – شهد	1
بصر – رأى – نظر	1
شهد – نظر – رأى	1
TOTAL	3

Table 2 outlines the occurrences of the term *basar* (بصر) in conjunction with its three primary synonyms across selected Hadiths in Sahih Bukhari. The data reveals three distinct triadic combinations, each occurring only once: *basar–raʾā–shahida* (بصر – رأى – شهد), *basar–raʾā–naẓara* (بصر – رأى – نظر), and shahida–naẓara–raʾā (شهد – نظر – رأى). These unique groupings are each found in different Hadiths, appearing respectively in the thematic books of the Virtues of Madinah, the Prophetic Commentary on the Qur'an, and the Interpretation of Dreams.

The Hadith depicting the interrogation of the deceased in the grave weaves a nuanced semantic tapestry through the use of three near-synonyms—*shahida, naẓara, and raʾā*. After burial, every soul is questioned by the angels Munkar and Nakir, and its fate hinges on the answers given (Badr al-Din Abi Muhammad Mahmud al-'Ainiy, 2001). Here, *shahida* extends beyond simple acknowledgment to signify a solemn testimony of faith, as the departed declares adherence to the Prophet Muhammad's (peace be upon him) message. *Naẓara*, by contrast, conveys an intense, deliberate gaze, capturing the focused vision of one's ultimate destination whether Paradise or Hell and thereby highlighting the gravity and immediacy of divine judgment. Complementing these, *raʾā* denotes the initial, sensory act of seeing, the first apprehension of the afterlife's realities. Together, these three lexical choices construct a layered narrative that emphasizes Islam's core themes of accountability, authentic belief, and the inescapable justice of God's final reckoning.

Conclusion

This study highlights how Sahih Bukhari deploys a carefully layered synonymy around baṣar (بصر) and its near-equivalents—raʾā (رأى), naẓara (نظر), and shahida (شهد)—to calibrate meaning: raʾā frames raw sensory perception, naẓara signals reflective scrutiny, shahida registers testimonial certainty, and baṣar conveys inward spiritual insight. By charting these terms across diverse narrative settings, from dream interpretation to eschatological questioning, the study demonstrates that seemingly interchangeable verbs in Prophetic speech actually perform discrete semantic and rhetorical tasks, thereby enriching exegetical precision and deepening appreciation of the linguistic–theological nexus in Hadith discourse.

Implications include sharpening Arabic semantic theory, offering finer-grained tools for Hadith commentators, and alerting translators to the doctrinal weight carried by subtle lexical choices. Limitations stem from the study's qualitative scope, its restriction to a single Hadith collection, and reliance on close reading rather than quantitative frequency analysis, which may overlook broader usage patterns.

Recommendations for future research are three-fold: (1) extend the analysis to other canonical compilations and to Qurʾānic usages to test the consistency of these semantic roles; (2) integrate corpus-linguistic or computational methods to capture larger distributional trends; and (3) explore how medieval and contemporary exegetes have interpreted these verbs to trace the diachronic evolution of their theological resonances. Such avenues would deepen our understanding of Arabic synonymy and further illuminate how the Prophet's lexical precision continues to guide both scholarly inquiry and devotional practice.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

AI-assisted technology was used in the preparation of this manuscript. Specifically, OpenAI's ChatGPT (GPT-4) was employed to assist with language refinement, structural editing, and enhancing academic clarity. The use of the tool was limited to improving the expression of ideas already formulated by the author, organizing content according to academic conventions, and proofreading for coherence and consistency. No content was generated independently by the AI; all substantive arguments, interpretations, and data analysis were conducted and verified by the author. The AI tool functioned solely as a language and editorial aid.

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Political Language in Austria and Slovakia Under the Sign of Alternative Truths

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Abstract

A clear trend toward populist and nationalist parties is evident in many European countries. This development is part of a larger pattern of political polarization also observed in Austria and Slovakia. In these countries, the Freedom Party of Austria (FPA) and the Slovak National Party (SNP) have achieved considerable success in recent elections. This study examines the language and rhetoric of these two parties based on their official Facebook communications from 2021 to 2024. Particular attention is paid to statements based on so-called "alternative truths"—claims that appear factual but lack evidence or are manipulative due to oversimplification and selective presentation. Methodologically, the analysis combines corpus-based evaluations with sketch engine, qualitative coding, and discourse analysis methods. A total of 5,347 posts were analyzed, including text posts, text-image combinations, and shared posts by party representatives. Our study focuses on widespread posts about topics such as the Coronavirus pandemic, migration, national sovereignty, and international organizations. The study demonstrates how linguistic strategies such as emotionalization, polarization, and simplification reinforce certain narratives. Despite linguistic and cultural differences, the hypothesis is that similar rhetorical strategies occur in the populist discourse of both parties. These strategies serve to mobilize supporters, criticize elites, and construct binary patterns of interpretation. The goal is to reveal the mechanisms of linguistic manipulation in digital political communication.

Keywords: populist rhetoric, alternative truths, linguistic manipulation, Facebook communication, corpus analysis

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Introduction

The communicative strategy of persuasion is typical of political language, as political actors are concerned with convincing their audience of a certain opinion to gain popularity, win votes, and ultimately come to power. Persuasion can be achieved through arguments, appeals, and open, rational rhetoric, but it can also be achieved covertly through emotionalization, distortion, framing, and similar means, so that one can speak of linguistic manipulation. Manipulative linguistic strategies are characteristic of populist rhetoric, which has increased significantly in Europe after the financial crisis in 2008 and especially after the migration crisis in 2015. In our article, we analyze those communicative strategies that have a manipulative character and work specifically with disinformation, alternative facts, and conspiracy narratives. The analysis is based on the examples of the Freedom Party of Austria (FPA) and the Slovak National Party (SNP).

Both parties can be described as conservative, right-wing nationalists to right-wing populists. The period from 2021 to 2024 was chosen for the analysis. This period includes a series of crises such as the COVID-19 pandemic, the war in Ukraine, the energy crisis, and inflation etc. Several studies point to a close link between crisis phenomena and the rise of populism, which means that the period is suitable for examining the language of populism. The period chosen also allows comparisons to be made between different phases (crisis, calm, new crises, election campaign). Both parties were in government opposition during the analyzed period, and their rhetoric intensified in the phases of election campaigns in 2023 (SNP) and 2024 (FPA). The SNP has been part of the Slovakian government since September 2023, and the FPA also recorded an election success in September 2024, which gave it the mandate to form a government in January 2025, even if it was subsequently unable to form a coalition. In order to be able to work based on comparable data, the years 2021 and 2022 are first used for both parties, and then the period from January to September of the respective election year is taken into account. In both countries, the elections took place in September. A total of 33 months is therefore examined for each party.

Since social media play an essential role in today's political communication, our study focuses on texts published by both parties on their official Facebook channels (Slovenská národná strana, n.d.; Freiheitliche Partei Österreichs, n.d.). The text corpus consists of a total of 5347 Facebook posts, including 2677 posts by the Slovak National Party (2021: 906 posts, 2022: 914 posts, 2023: 857 posts and 2670 posts by the Freedom Party of Austria (2021: 882 posts, 2022: 900 posts, 2024: 888 posts). The analysis included all text posts and images with text; the content of video posts was not analyzed. Posts from direct party members and election candidates that were shared via the party's official Facebook page were also included in the analysis. For the SNP, these shared posts account for up to 43 percent of all posts, for the FPA, only 3.6 percent. All of the evidence included represents direct and official communication between the party and the public.

Our methodology includes computational analysis using Sketch Engine and combines a quantitative and qualitative approach. Our procedure for analyzing the created corpus consists of four steps. In the first step, Sketch Engine is used to identify the most frequent keywords; in the second step, thematic clusters are formed, and the thematic focuses are compared; in the third step, alternative facts and obvious disinformation are identified and compared.

Den Vorteil der Korpusanalyse in dem politischen Kontext verbinden wir mit dem Ansatz, den Ammalie Kutter (2017) folgend beschreibt:

> Corpus analysis does not present texts according to their linear or intertextual composition. Instead, it highlights patterns of regular use of single words or word clusters as they appear in a large collection of texts. Whether showing these words in situ or quantified abstraction, this reading provides us with a bird eye view of the use of specific words across all the texts contained in a corpus. In addition, the display of word clusters reveals patterned semantic, syntactic, and so on, relationships between words. This provides us with an additional layer of interpretation, which cannot be gained otherwise. (p. 183)

With the term *alternative truths*, we are partly inspired by the term *alternative realities* used by Götz-Votteler and Hespers (2019, p. 12), who subsume under this term *fake news* (obvious false reports intended to damage political opponents), *alternative facts* (false statements by members of the public or representatives of institutions) as well as *conspiracy theories*.

Regarding the analysis of the discourse, we also rely on the work of van Dijk (2017) and his view that socio-political manipulation involves dominance and power abuse and is usually ideological and can be linked to ideological polarization (pp. 226–231).

Identification of Keywords in the Political Discourse of SNP and FPA

Two independent corpora were created in the Sketch Engine tool. The corpus of Facebook posts of the Slovak National Party comprises 448980 tokens, 376697 words, and 28703 sentences, while the corpus of texts of the Freedom Party of Austria consists of 172293 tokens, 147629 words, and 10485 sentences. Despite a comparable number of analyzed Facebook posts, an asymmetry in the size of the corpora can be observed, which results from the fact that the FPA works with significantly more video posts. As our analysis is strictly text-based, this type of post could not be analyzed, and only the text parts of these posts, if available, were included in the text corpus.

The first step was to identify the individual keywords. Sketch Engine uses the reference corpus German Web 2023 (deTenTen23) for the German language and Slovak Web 2023 (skTenTen23) for the Slovak language as a basis for comparison. The original results had to be filtered manually for our analysis. All words relating to the names of the authors of the Facebook posts and the names of their political representatives or their political party were filtered out of the list of keywords, as these are fundamentally of no significance and are irrelevant for the further thematic comparison. The repetitive keywords (e.g., identical words with different grammatical endings and forms) were also grouped together. The 50 most frequent keywords for both parties are shown in Tables 1 and 2.

Table 1

50 Most Frequent Single-Word Keywords in the SNP Corpus

SKETCH ENGINE

	Lemma		Lemma		Lemma		Lemma
1	Sputnik	14	padnutý	27	lotéria	40	rozhádaný
2	pronárodný	15	pitevný	28	Ódor	41	ambasáda
3	demisia	16	Čaputová	29	očkovací	42	servilnosť
4	zvrchovanosť	17	liberálny	30	nekompetentnosť	43	koaličný
5	Heger	18	Kollár	31	Korčok	44	referendum
6	sorosovský	19	prozápadný	32	Matovič	45	Covid
7	prezidentka	20	Slavín	33	štvorkoalícia	46	OĽANO
8	proslovenský	21	zdražovanie	34	sebestačnosť	47	proamerický
9	mimovládky	22	vatra	35	očkovať	48	vulgárnosť
10	úradnícky	23	Sulík	36	koalícia	49	marazmus
11	liberálny	24	Nordstream	37	expremiér	50	dezoláti
12	dražoba	25	NRSR	38	Remišova		
13	nekompetentný	26	národniar	39	neočkovaný		

Table 2

50 Most Frequent Single-Word Keywords in the FPA Corpus[1]

SKETCH ENGINE

	Lemma		Lemma		Lemma
1	Nehammer	18	Impfpflicht	35	ÖVP-Nehammer
2	schwarz-grün	19	Asylwerber	36	rot-weiß-rot
3	Einheitspartei	20	Scheinopposition	37	Asylzahl
4	ÖVP	21	Corona-Politik	38	Bundespräsidentschaftswahl
5	Volkskanzler	22	FPÖ-Facebookseite	39	Massenmigration
6	Impfzwang	23	U-Ausschuss	40	Volksbegehren
7	Corona-Wahnsinn	24	VdB	41	ungeimpft
8	türkis-grün	25	Asylpolitik	42	Kanzler
9	Nachschauen	26	Nationalratswahl	43	Systempartei
10	EU-Wahl	27	EU-Wahnsinn	44	Afghane
11	ÖVP-Innenminister	28	Neutralität	45	Grenzschutz
12	freiheitlich	29	ORF2	46	ORF
13	Österreicher	30	SPÖ	47	Kostenlawine
14	Ungeimpfte	31	Asylstopp	48	COFAG
15	ÖVP-Kanzler	32	Migrationspolitik	49	Teuerungswelle
16	Teuerung	33	Pressekonferenz	50	schwarz-rot-grün-pink
17	Russland-Sanktion	34	Massenzuwanderung		

[1] English translation of the keywords: 1. Nehammer, 2. black-green, 3. Unity Party, 4. ÖVP (political party), 5. People's Chancellor, 6. Compulsory vaccination, 7. Corona madness, 8. turquoise-green, 9. Look up, 10. EU election, 11. ÖVP Interior Minister, 12. liberal, 13. Austrians, 14. Unvaccinated, 15. ÖVP Chancellor, 16. Inflation, 17. Russia sanction, 18. Compulsory vaccination, 19. Asylum seekers, 20. Sham opposition, 21. Corona policy, 22. FPÖ Facebook page, 23. Investigation committee, 24. Van der Bellen, 25. Asylum policy, 26. National Council election, 27. EU madness, 28. Neutrality, 29. ORF2, 30. SPÖ (political party), 31. Asylum stop, 32. Migration policy, 33. Press conference, 34. Mass immigration, 35. ÖVP-Nehammer, 36. red-white-red, 37. Asylum number, 38. Federal presidential election, 39. Mass migration, 40. Referendum, 41. Unvaccinated, 42. Chancellor, 43. System party, 44. Afghans, 45. Border protection, 46. ORF, 47. Cost avalanche, 48. COFAG, 49. Wave of inflation, 50. black-red-green-pink.

The initial identification of the most prevalent keywords is the basis for the following parts of the analysis. This is followed by a comparison of Slovak and Austrian discourse from a thematic perspective, which is discussed in the following section.

Comparison of Thematic Clusters

To enable a thematic comparison, the individual keywords were sorted into thematic clusters, which then allowed a comparison of dominant topics between the respective national political discourses. The keywords of the SNP can be grouped into the following thematic clusters:

- national sovereignty (pro-national, pro-speech, sovereignty, nationalist, self-sufficiency, campfire, national monument, Slavin)
- critique of liberalism (liberal, liberals, pro-Western, Sorosian, anti-national, extra-governmental, vulgarity, disgust, desolates)
- criticism of the government and elites (resignation, Heger, president, Čaputová, incompetent, bureaucratic, fallen, Kollár, Sulík, NRSR, Ódor, incompetence, Korčok, Matovič, coalition, ex-prime minister, Remišová, coalition, referendum, OĽANO, quadruple coalition, divided)
- The economic and social crisis (inflation, rising prices, chaos)
- geopolitical narratives (Nordstream, embassy, servility, pro-American)
- COVID-19 and vaccination (Sputnik, vaccine, unvaccinated, COVID, lottery, autopsy, vaccinate)

By its very nature, the SNP emphasizes the protection of national identity, emphasizes traditions and history, celebrates the Slovak National Uprising during World War II, and emphasizes the national cultural institution called Matica slovenská. It sees the government itself and its representatives as a danger and a threat to sovereignty, criticizes their incompetence, the instability and division of the coalition, and calls for a referendum and the formation of a new national government. For this reason, the party calls for the unification of national forces and seeks a coalition of pro-national parties before the elections. It uses the current economic situation and inflation, the decline in the living standards of Slovaks, to criticize the government. It also exploits the migration crisis, warning against mass migration and opposing the acceptance of refugees. On the global geopolitical scale, it suspects the United States and the European Union of manipulating and oppressing Slovakia and uses anti-American and anti-Brussels rhetoric. Regarding the war in Ukraine, the SNP calls for an end to the war and argues against unilateral support for Ukraine. It speaks negatively about the handling of pandemics, criticizes the measures taken, questions the coronavirus itself and vaccination, or promotes the Russian Sputnik vaccine. SNP also combines various points of criticism with accusations of media bias and calls for “objective” reporting.

Some shifts in preferred topics can be observed in the individual years analyzed. In 2021, the theme of pandemics and vaccination, criticism of vaccination policy, and the chaos in the measures taken dominated. There are hints of conspiracies about the origin of COVID and warnings against compulsory vaccination. There is also strong anti-government rhetoric directed, for example, against political representatives such as Matovič, Sulík, or Čaputová. There is also a strong appeal to national sovereignty. In 2022, the focus is on the war in Ukraine, criticizing the Western view of this conflict and seeking a friendly relationship with Russia. More prominent are also economic themes - in particular inflation and rising energy prices, and deteriorating living standards, expensive medicines, etc. By the end of 2022, a narrative of uniting national forces and forming a common bloc of political parties begins to emerge. The dominant tone of 2023 is one of electoral mobilization, with a growing attack on

progressive and liberal parties, as well as elites and the media. The rhetoric against the opposing candidates, such as the political parties Hlas, KDH, Progressive Slovakia, etc., is escalating. Opponents are often labelled as traitors to the nation.

The keywords of the FPA can be grouped into the following thematic clusters:

- COVID-19 / vaccinations (compulsory vaccination, corona madness, unvaccinated, corona policy, unvaccinated),
- National identity and protection (Austria's national chancellor, Austrians, red-white-red, neutrality),
- Migration and asylum policy (Asylum seekers, asylum policy, asylum stop, migration policy, mass immigration, mass migration, border protection, Afghans, asylum numbers),
- Government criticism and system parties (black-green, turquoise green, ÖVP, SPÖ, system party, unity party, ÖVP-Nehammer, ÖVP-Chancellor, ÖVP-Interior Minister),
- Inflation and economic crisis (Inflation, Russia sanctions, EU madness),
- Media criticism (ORF2, FPÖ Facebook page, FPÖ TV),
- Election campaign and mobilization (EU election, National Council election, federal presidential election, referendum, press conference).

The topics addressed by the FPA included criticism of coronavirus measures, lockdowns, and compulsory vaccination. Corona is portrayed as a fraud, a lie, or a staging, and the WHO pandemic treaty is seen as a threat to national freedom. The emphasis on national unity draws attention to illegal immigration, calls for a halt to asylum, and propagates a strong anti-migration policy. Austrian identity, the values of Western culture, Christian values, and love of one's homeland are emphasized. Similar to the SNP, the government is criticized, and the FPA is stylized as the only opposition force against an aloof political system. A great deal of scepticism is expressed towards the EU, and national sovereignty and independence are opposed to EU centralization. In the context of the crisis and inflation, social criticism in particular is voiced. The FPA presents itself as a protective force for hard-working people. Public media are repeatedly attacked as propaganda machines in the posts. In 2024, strong campaigns are run for Herbert Kickl, with the narrative “everyone against Kickl.”

From a chronological perspective, topics such as Covid policy, accusations against the coalition government and its failures, migration, and economic concerns dominated in 2021. The first hints of conspiracy theories in connection with the WHO and the elites also emerge. In 2022, it was COVID-19 and compulsory vaccination, incidents involving migrants, a wave of inflation, and anti-EU rhetoric. In 2024, massive confusion narratives spread about a secret global health dictatorship plan. Extreme focus on inflation, energy prices, and fears of social decline. Mobilization themes emerge as part of the election campaign - these include migration and crime, economic existential fears, and the culture war. The contributions are characterized by apocalyptic language (*total loss*, *Austria's downfall*) and scandalization of the other parties.

Analysis of the Use of Alternative Truths

In the presentation of most of the topics mentioned, Facebook posts regularly appear in which the facts presented do not always correspond to the real facts. Both parties also integrate so-called alternative facts and disinformation into their narratives, which they use to create alternative truths that are also manipulative in nature.

In order to identify particular alternative truths, we need to look at how they are produced and subsequently instrumentalized in a particular political discourse. Let's take a look at one example from the SNP:

> The Slovak National Party calls on the government of Eduard Heger to resume negotiations on the supply of Sputnik. We have experienced the disgrace of Slovakia returning Sputnik. Fortunately, the Russian Federation has left us without penalties and sanctions. In the summer months, the Chairman of the Slovak National Party held talks with Industry Minister Manturov, who assured him that the Russian Federation was capable of supplying Sputnik again at any time if it was of interest to the Slovaks. Sputnik can help to increase vaccination rates. The patient should be able to get the medicine regardless of whether the medicine is from the West or the East. The policy should not apply to medicines. If a medicine is effective and has the confidence of the patient, it does not matter what latitude it comes from. The Slovak National Party is using the example of Hungary to show that Sputnik is effective and helps people. We emphasise that vaccination must be voluntary and that, before vaccination, a Slovak citizen should have a blood test to measure antibodies and, above all, outpatient treatment should be strengthened. It is also important to raise the salaries of healthcare workers, just as the SNP has raised the salaries of teachers. If the Czechs have managed to raise the salaries of healthcare workers by 27% in one year, the Slovak Republic must do the same. (Slovenská národná strana, 2021)

In this post from December 4, 2021, the Slovak National Party criticizes the Slovak government's handling of the Sputnik vaccine and advocates for renewed negotiations with Russia to secure its supply. Emphasizing the vaccine's potential to boost vaccination rates, SNP argues that medical treatments should be judged by effectiveness rather than geopolitical origin. The party promotes voluntary vaccination, antibody testing, and improved outpatient care, while also highlighting the need for increased healthcare worker salaries in line with regional examples. The text constructs several alternative truths:

a) We have experienced the disgrace of Slovakia returning Sputnik. Fortunately, the Russian Federation has left us without penalties and sanctions.

The fact is: Slovakia did not violate the treaty with the Russian Federation; therefore, there was no reason to apply sanctions. The claim gives the impression that Russia “generously forgave” the fine, thereby positively framing Russia and at the same time stigmatising the government's decision not to use the Sputnik V vaccine, which was not approved by the EMA (European Medicines Agency). It serves to mobilise emotionally against “Western” policies and to give the impression that Slovakia has made a “mistake.”

b) Sputnik can help to increase vaccination rates.

This is a speculative claim with no evidence. There are no known studies from Slovakia showing that the Sputnik V vaccine significantly increased public interest in vaccination at a time when distrust of vaccination was generally high. The statement is suggestive - it presents a hypothesis as fact.

c) The policy should not apply to medicines. If a medicine is effective and has the confidence of the patient, it does not matter what latitude it comes from.

In this case, it is a simplification of the problem and an alternative truth. In reality, drugs and vaccines have to pass scientific and regulatory scrutiny - it is not just about "patient trust." The statement denigrates the role of the European Medicines Agency and the Slovak State Institute for Drug Control and other professional authorities and misleads the public into thinking that "trust" is enough when choosing a vaccine. The policy on medicines is not a question of origin, but of safety, efficacy, and approval by the relevant authorities.

d) The Slovak National Party is using the example of Hungary to show that Sputnik is effective and helps people.

In this case, the deployment is based on the selection of selective data. Hungary did use Sputnik, but did not have publicly available, transparent data on its effectiveness compared to other vaccines. This statement ignores the wider context: Sputnik has not been approved by the European Medicines Agency and has not been widely used in EU countries. Typical of disinformation narratives: choosing a "friendly" country (Hungary) as a model while ignoring opposing views.

e) a Slovak citizen should have a blood test to measure antibodies.

This is an unscientific recommendation. Such testing is not standardly recommended by any professional authorities, as the antibody value does not guarantee immune protection. It is a misleading recommendation that may discourage people from getting vaccinated, as they will think that they "no longer need" the vaccine. This is a common strategy of disinformation actors who use "scientific-sounding" suggestions without any basis in reality.

f) just as the SNP has raised the salaries of teachers

This narrative is repeated in a number of other posts, yet it is a twisting of the merits, as the salary increases were the result of a number of actions by the coalition government, not just the SNP.

Similarly, different alternative truths can also be identified in the posts of the FPA:

> The fact that large numbers of people feel compelled to get vaccinated to avoid testing harassment, to avoid losing their jobs, to avoid being excluded from social life, to avoid being the victim of bullying, to be allowed to move around freely, etc., is a disgrace and, in my view, should have legal repercussions for those responsible for this. I see the government's announcement of the introduction of a general coronavirus vaccination requirement from the beginning of February 2022 as a major deception and the last possible threat. We know this from leaked government information. It sounds like an ultimatum with the message: get vaccinated now, otherwise we'll force you to anyway. Resistance is pointless. But the government is just playing poker. Because it knows a few things very well: the more people who are not impressed by this threat, the harder it will be for them to implement the vaccination obligation. [...] The government knows the problem of the avalanches of objections that will arise, right up to the highest courts. It is fully aware of the problems under EU law in connection with the definition of 'compulsory vaccination'. It would have to run the risk of entire areas of the working world being paralyzed by protests and resistance actions. There would be an international outcry if

> people were imprisoned in Austria for exercising their right to physical integrity. (Kickl, 2021)

The following aspects have a conspiratorial character or can be described as alternative truths:

a) We know this from leaked government information.

There is no publicly verifiable evidence of such “leaked” policy papers or ultimatums on mandatory vaccination to support this claim. Invoking secret sources without evidence is speculative and typically used in conspiracy theory rhetoric.

b) I see the government's announcement of the introduction of a general coronavirus vaccination […]as a major deception and the last possible threat

The introduction of compulsory vaccination in Austria was decided politically, but later suspended and repealed. There is no evidence that the announcement was merely a threat; the allegation of deliberate deception is unfounded.

c) There would be an international outcry if people were imprisoned in Austria for exercising their right to physical integrity.

The imprisonment of vaccination refusers has never been a law or political reality in Austria; the idea that citizens are sent to prison because of this is an unfounded exaggeration and fear rhetoric.

In the context of vaccination, this next example also reveals further inconsistencies:

> A few days ago, the Health Committee held a hearing with experts on the referendum on ‘vaccine freedom.’ Our Member of the National Council, Gerald Hauser, confronted the President of the Medical Association, Szekeres, who acted in a more than simply PURPOSEFUL manner in the committee anyway, with the statement of the WHO Director for Europe that ‘vaccination does not end the pandemic! (FPÖ, 2021)’

a) Hans Kluge's statement is presented as if even the WHO had admitted that vaccination is useless or ineffective, which is not the case. This is a classic disinformation strategy of abbreviation. The original quote says: “We also need to be conscious of the fact that vaccines alone will not end the pandemic” (Kluge, 2021). What is meant is that although vaccination is a key means of controlling the pandemic, it is not the only one.

b) The text also defames experts. Instead of arguing on the merits, the president of the Medical Association is discredited across the board, even though he was one of the advocates of evidence-based measures during the pandemic.

c) In addition, a suggestive presentation of the referendum is sought. The term *vaccination freedom* suggests that such freedom did not previously exist, although vaccinations were never made mandatory for the entire population in Austria. There can therefore be no question of withdrawing the freedom to vaccinate.

These examples alone demonstrate that alternative truths are closely linked to linguistic manipulation. Tables 3 and 4 show the most typical foci of manipulation in our analyzed corpus.

Table 3
Focal Points With Disinformation and Alternative Facts by SNP

Topic	**Typical manipulation**
Covid-19 / vaccinations	Trivialization of Covid, scare tactics against vaccinations
Migration	Migrants stylized as a threat
Western institutions	USA/EU portrayed as secret oppressors
Ukraine war	Ukraine as the culprit, Russia as the victim
Elites and media	Media and politics demonized across the board

Table 4
Focal Points With Disinformation and Alternative Facts by FPA

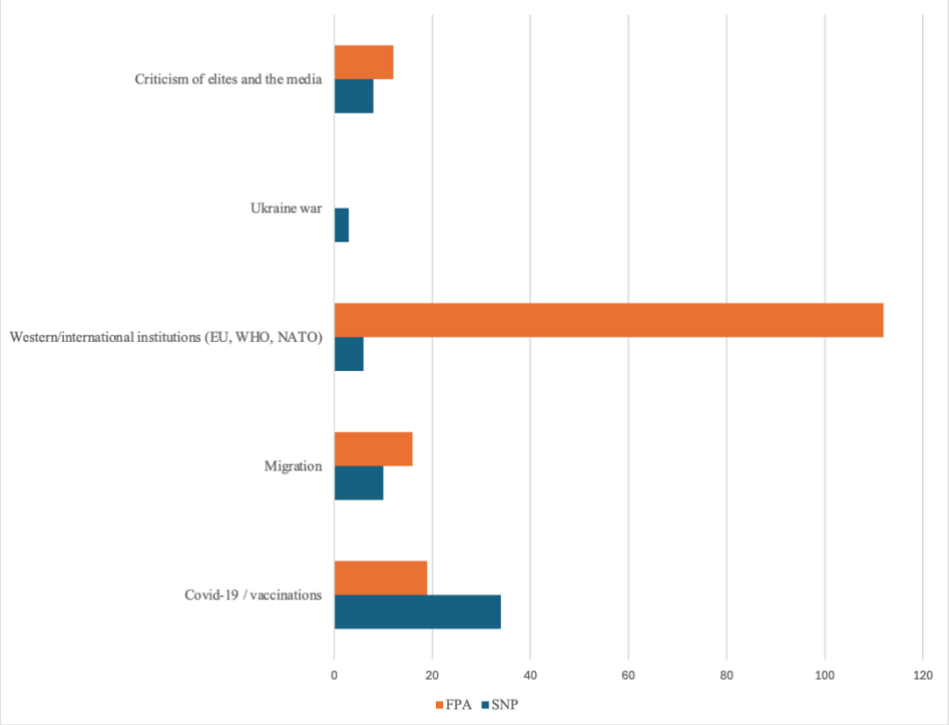
Topic	**Typical manipulation**
Covid-19 / vaccinations	Anti-vaccination rhetoric, trivlization of pandemic
Migration	Population substitution narrative
International institutions	EU/WHO as conspiracy actors
Elites and system	System Party and elite conspiracy

Table 3 shows the most typical focal points of manipulation in the texts by the SNP. We find disinformation about vaccinations, which are allegedly unsafe and dangerous, and even weaken natural immunity. Governments and elites allegedly use the pandemic to oppress the population (they use terms such as *vaccine mafia* or *pandemic fraud*). When it comes to migration, migrants are portrayed as a threat to security and national identity, and migration is described as a planned and organized invasion. The narrative that the EU and the USA are systematically controlling or colonizing Slovakia and that NATO and the EU are acting against national interests borders on a conspiracy narrative. In the Slovakian context, the war in Ukraine is also addressed, with Ukraine being portrayed as the main culprit of the war and Russia being positioned as the guarantor of peace and victim of the West. In the final focus, the media are interpreted as tools of foreign powers, and politicians and experts are described as traitors and manipulators.

The FPA (see Table 4) is also spreading disinformation about vaccinations, which are portrayed as ineffective, dangerous, and part of a higher plan, while state measures in the context of the pandemic are presented as a deliberate deprivation of liberty. Migration is mainly described as mass immigration and a flood of asylum seekers. It is assumed that this is a plan to replace the native population. These statements show characteristics of conspiracy theories. The same applies to criticism of international institutions such as the EU, WHO, or NATO, which threaten national sovereignty and are allegedly involved in secret plans for global control. It is claimed that coordinated attacks on the population are taking place without any concrete evidence.

In general, fear and uncertainty are spread, complex political contexts are simplified, and national identity is defined by supposed external threats. FPA uses targeted conspiracy narratives even more systematically than SNP. On both sides, the contributions work with strongly emotional terms and use simplistic depictions and blame. Figure 1 shows a comparison of the instrumentalization of disinformation and alternative facts by SNP and FPA.

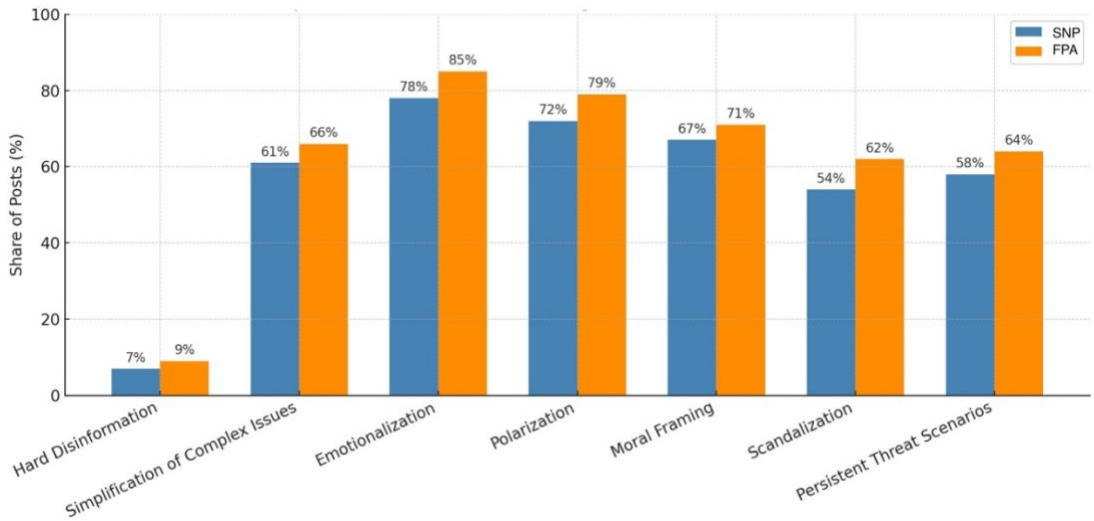
Figure 1
Comparison – Disinformation and Alternative Facts by SNP and FPA



Over 55% of SNP posts are related to Covid-19 and vaccinations, with migration and criticism of the elite being secondary. The war in Ukraine is also discussed to a lesser extent. Over 70% of FPA posts deal with international institutions. COVID and migration make up a significantly smaller proportion than in SNP.

Explicit disinformation was identified in only 7 to 9% of the posts. In contrast, rhetorical features predominate, using polarization and exaggeration in particular, but also other rhetorical devices. These comprise around 60 to 80% of the posts. The most common manipulative strategies of both parties in comparison can be seen in Figure 2.

Figure 2
Comparison of Manipulative Rhetorical Strategies of SNP and FPA



Conclusion

This analysis revealed that both the SNP and the FPA frequently use alternative truths in their digital communications on Facebook. These truths are often closely linked to manipulative language strategies based on emotionalization, moralization, simplification, polarization, and scandalization. Analysis of thematic clusters shows that both parties target specific topics, such as the Coronavirus pandemic, migration, national identity, and criticism of the elite. Subsequent analysis of disinformation reveals that SNP contributions are dominated by content related to the Coronavirus and anti-Western narratives, while the FPA systematically relies more on conspiracy theories and anti-EU statements. Further analysis indicates that emotional and manipulative rhetoric is present in over 60% of posts. Direct disinformation was detected in only 7-9% of the posts; however, rhetorical techniques of populist linguistic manipulation, such as constructing enemy images, black-and-white thinking, appeals to authority, frame shifting, generalization, stigmatization, and othering, are central elements of both parties' communications. Thus, the analysis confirms the initial hypothesis that, despite linguistic and cultural differences, both parties use comparable persuasive patterns. These patterns are strongly contextualized but structurally similar. Future studies should investigate semantic prosodies and discursive networks to more precisely capture the strategic use of political language in the digital space. Following these analyses, it would be useful to examine the contexts and concordances of keywords in the context of disseminating alternative truths, a topic we would like to address in future studies.

Acknowledgments

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Ending Tuberculosis in Thailand's Prisons by 2030: Aspirations vs. Challenges

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Abstract

Tuberculosis (TB) remains a significant global public health challenge, particularly in prisons, where inmates face a disproportionate burden. In Thailand, prisons are hotspots for both TB and multidrug-resistant TB (MDR-TB), with increased transmission risks from staff, visitors, and released inmates. This article aims to: 1) assess the current TB situation through intensified case finding and diagnosis in prisons; 2) identify social determinants of health that improve monitoring and treatment for TB; and 3) evaluate diagnosis and treatment success rates among inmates. We used a mixed-methods approach, involving trained prison healthcare volunteers who administered a standardized questionnaire based on the International Standards for Tuberculosis Care and the Guidelines for Control of Tuberculosis in Prisons. High-risk individuals were referred for confirmatory testing, including chest X-rays and sputum AFB tests, while confirmed cases received treatment in local hospitals until recovery or release. From 2021 to 2024, we screened 351,737, 259,278, 280,921, and 363,825 new arrivals and existing inmates, achieving TB confirmation rates of 1.06%, 0.91%, 0.89%, and 0.89%. Our treatment success rate has consistently exceeded 90%. The Royal "Good Health, Good Heart" project, initiated under the patronage of His Majesty the King, aims for comprehensive TB and MDR-TB screening and treatment by 2030. This initiative seeks to ensure nearly complete coverage in TB prevention and control, particularly for new arrivals, emphasizing the need for targeted strategies that consider social determinants of health to achieve the goal of "Ending TB by 2030."

Keywords: ending tuberculosis, prison health, screening, social determinants of health, the royal Good Health, Good Heart project

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Background

Tuberculosis (TB) remains one of the most urgent public health challenges worldwide, despite being a preventable and treatable disease (World Health Organization [WHO], 2023). In 2023, TB likely regained its position as the leading cause of death globally from a single infectious agent, highlighting its continued threat to public health (WHO, 2024). Over 10 million people are diagnosed with TB each year, and this figure has been steadily increasing since 2021. Recognizing the severity of this crisis, the international community—including the United Nations and the WHO—has set ambitious targets to end the TB epidemic by 2030. Achieving this vision demands comprehensive strategies that address social determinants, enhance detection and treatment, and prioritize high-risk populations.

Thailand ranks among the 30 countries with the highest TB burden worldwide and is also listed among the 30 high TB/HIV burden countries, reflecting the significant overlap of these epidemics within its population. However, Thailand is not included among the 30 countries with the highest prevalence of multidrug-resistant TB (MDR-TB), indicating a comparatively lower reported rate of drug-resistant strains. Nonetheless, TB remains a significant public health concern, particularly among vulnerable groups such as incarcerated populations (Dadu et al., 2021; Reichard et al., 2003).

Prisons and correctional facilities are recognized as critical hotspots for TB transmission, due to overcrowded living conditions, limited healthcare access, and often insufficient infection control measures (Adebisi et al., 2022; Cords et al., 2021). In Thailand, 143 prisons have become focal points for TB and MDR-TB, with approximately 280,000 inmates experiencing disproportionately high infection rates compared to the general population (The Global Fund, 2024). The risk of transmission is further amplified by interactions with staff, visitors, and the high turnover of inmates through releases and transfers. These factors not only facilitate the spread of TB within prisons but also pose a threat to community health, making prison health a vital component of national TB control strategies (Gygli et al., 2021).

This paper explores the current landscape of TB within Thailand's prisons, examining the challenges and opportunities in achieving the national goal of ending TB by 2030. It will identify gaps between aspirations and realities, analyze existing policies, and propose strategies to strengthen TB control efforts within correctional facilities. Ultimately, addressing TB in prisons is essential not only for safeguarding inmate health but also for advancing broader public health objectives and ending the TB epidemic across Thailand.

Objective

This article aims to:

1) assess the current TB situation through intensified case finding and diagnosis in prisons;
2) identify social determinants of health that improve monitoring and treatment for TB; and
3) evaluate diagnosis and treatment success rates among inmates.

Method and Methodology

A mixed-methods approach was employed, combining qualitative and quantitative data collection. Trained prison healthcare volunteers administered a standardized questionnaire

developed in accordance with the Guidelines for the Control of Tuberculosis in Prisons (Division of Tuberculosis, 2023) and the Consolidated Guidelines on Tuberculosis. Module 2: Systematic screening for tuberculosis disease (World Health Organization [WHO], 2021). Individuals identified as high-risk for TB were referred for confirmatory diagnostic procedures, including chest X-rays and sputum acid-fast bacilli (AFB) tests (Pramart & Prommas, 2023).

Findings

Screening and Diagnostic Data (2021–2024)

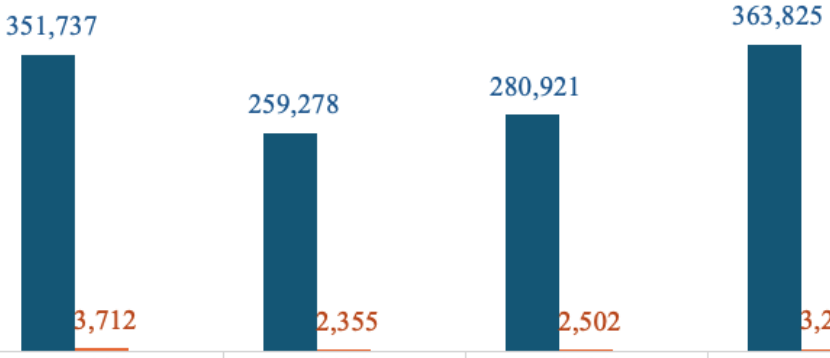
Between 2021 and 2024, significant efforts were made to enhance TB screening, diagnosis, and treatment within the prison system (Division of Tuberculosis, 2025). During this period, a total of 1,255,761 individuals—comprising both new arrivals and existing inmates—were screened for tuberculosis across various facilities. The annual screening numbers were 351,737 in 2021, 259,278 in 2022, 280,921 in 2023, and 363,825 in 2024. The screening process incorporated initial symptom assessments and, for high-risk individuals, confirmatory diagnostic tests such as chest X-rays (CXR) and sputum acid-fast bacilli (AFB) tests.

To improve early detection, the screening interval was reduced from 30 days to just 14 days upon arrival, facilitating more timely diagnosis. Any identified TB cases were registered for treatment within 1–2 weeks, ensuring prompt intervention. Additionally, suspected or confirmed TB cases were quarantined separately in designated rooms to prevent transmission within the prison populations.

Further details and trends are illustrated in Figure 1. The data show that the proportion of confirmed TB cases among those screened remained relatively stable over the years, with confirmation rates of approximately 1.06% in 2021, 0.91% in 2022, 0.89% in 2023, and 0.89% in 2024 (Division of Tuberculosis, 2025). This consistency indicates a steady prevalence of active TB within the inmate population despite intensified screening efforts.

Figure 1

TB Screening, TB Confirmation, and Percentage of TB Cases



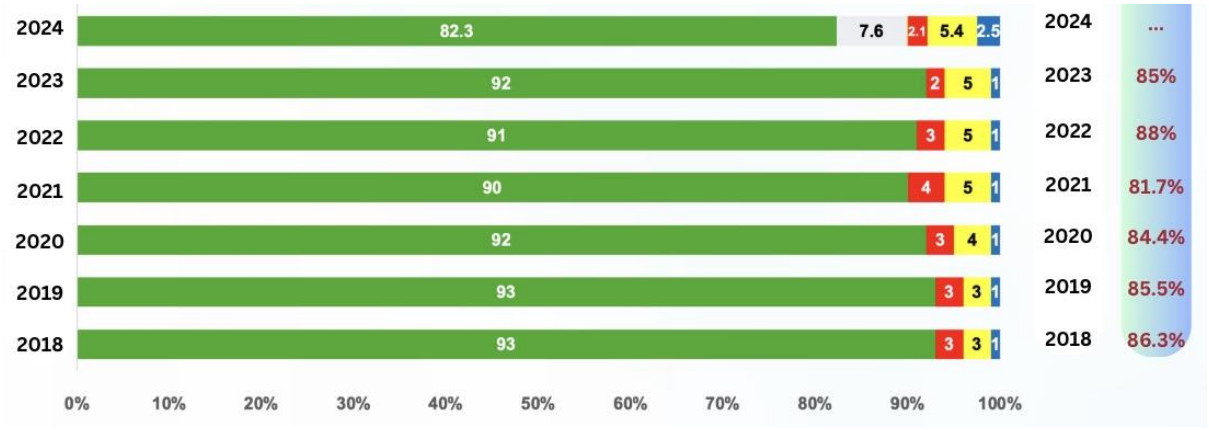
	2021	2022	2023	2024
TB screening	351,737	259,278	280,921	363,825
TB confirmation	3,712	2,355	2,502	3,246
% TB	1.06	0.91	0.89	0.89

Treatment Success Rate in Prison

Throughout this period, the treatment success rate in prisons has consistently exceeded 90%, demonstrating effective management and adherence to treatment protocols. Specifically, the success rates were approximately 90% in 2021, 91% in 2022, 92% in 2023, and 82.3% in 2024 (Division of Tuberculosis, 2025). The slight decline in 2024 is mainly attributed to the ongoing confirmation of TB cases at the end of the year, which temporarily affected reported success rates. In comparison, the TB treatment success rate in communities has been consistently lower, ranging from 81% to 88% between 2018 and 2023 (Division of Tuberculosis, 2025), as shown in Figure 2.

Figure 2

TB Treatment Success Rates in Prisons and Communities



These figures underscore a positive trend of steady treatment success within both the inmate population and the broader community, highlighting the effectiveness of the targeted interventions in prisons. The intensified screening and prompt treatment initiatives have contributed to maintaining low and stable prevalence rates, while also ensuring that those diagnosed with TB receive timely and effective care.

Discussion

The implementation of more frequent and systematic TB screening, notably reducing the screening interval to 14 days upon prison entry, has been instrumental in enabling early detection and containment of TB within correctional facilities. The integration of chest X-rays and other diagnostic tools has enhanced the accuracy of case confirmation, allowing for prompt identification and swift initiation of treatment (Haeusler et al., 2022).

The consistently high treatment success rates observed in prisons reflect the effectiveness of comprehensive healthcare strategies, including active case finding, quarantine measures for suspected or confirmed cases, and immediate treatment initiation (Kelemework et al., 2019). These coordinated efforts not only improve individual patient outcomes but also substantially reduce the risk of TB transmission in the densely populated prison environment (Dara et al., 2015; Lange et al., 2018).

Nevertheless, the slightly lower and more variable success rates in the community highlight ongoing challenges related to treatment adherence outside the prison setting (Martinez et al., 2023). To address these issues, continued efforts are necessary to strengthen community-

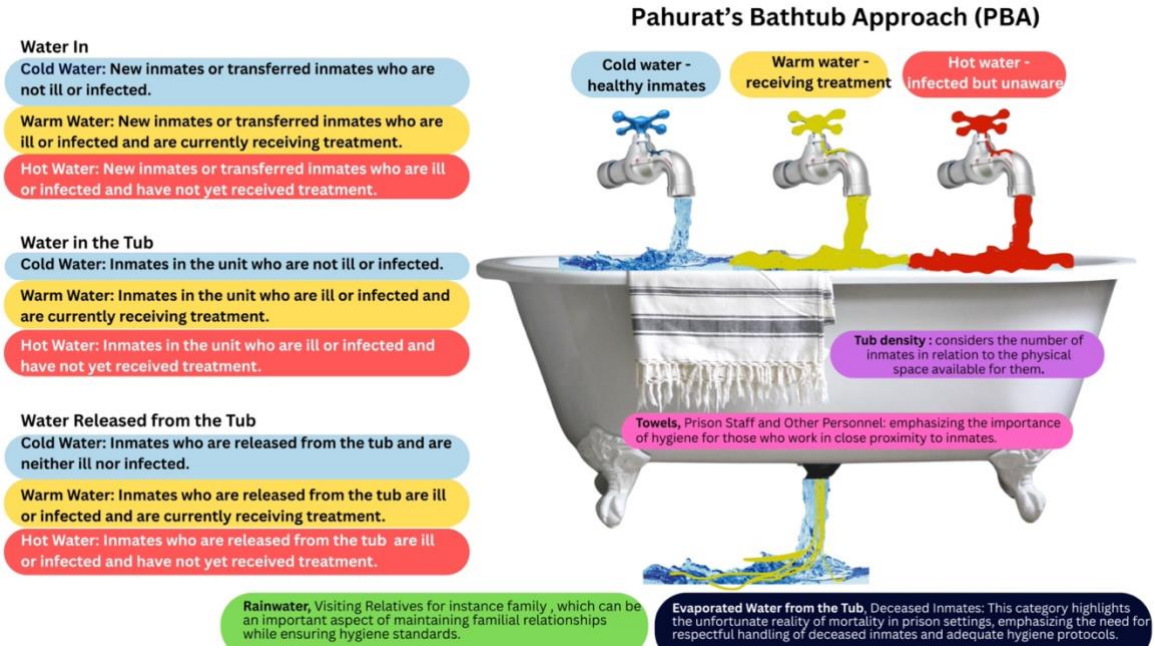
based TB control programs, improve access to diagnostic and treatment services, and tackle social determinants that contribute to TB transmission (Placeres et al., 2023).

Collectively, these findings demonstrate that targeted screening, rapid diagnosis, and effective treatment protocols within prisons can serve as a model for TB control and contribute to broader public health objectives. Sustaining and expanding these initiatives will be critical for further reducing TB prevalence both within correctional facilities and in the wider community (Stuckler et al., 2008; World Health Organization, 2021).

Future Research

The Pahurat's Bathtub Approach (PBA) offers a comprehensive framework for health management within correctional facilities through systematic assessments at key stages: intake, during detention, and pre-release. This model classifies inmates into three health statuses—Cold Water, Warm Water, and Hot Water—to facilitate targeted interventions as illustrated in Figure 3.

Figure 3
Pahurat's Bathtub Approach-PBA



Maintaining prisoners in the Cold Water category, indicating no current health threats, emphasizes the importance of proactively addressing social determinants of health. By focusing on prevention and health promotion, the PBA aims to sustain a healthy prison population and prevent the progression of latent or undiagnosed conditions (Taisuwan & Chotthanapund, 2025).

For those in Warm Water, ongoing care and treatment are essential to effectively manage existing health issues. Meanwhile, individuals in Hot Water—those unaware of their infection—require targeted screening and treatment to prevent disease transmission and support their successful reintegration into society (Taisuwan & Chotthanapund, 2025).

A key component of the PBA is universal screening of all new arrivals with chest X-ray (CXR), ensuring early detection of TB and other health conditions. Any abnormalities identified are addressed with treatment within 1–2 weeks, aligning with best practices for infectious disease control (Haeusler et al., 2022). Additionally, inmates will undergo annual CXR screenings, with re-screening within six months prior to release to identify and address any emerging health concerns (Haeusler et al., 2022).

Overall, the Pahurat's BathTub Approach underscores a proactive, staged, and comprehensive strategy for health management in correctional settings. Future research should evaluate its effectiveness in reducing disease transmission, improving health outcomes, and supporting successful reintegration, while also exploring strategies to address social determinants influencing health within these populations (Taisuwan & Chotthanapund, 2025).

Conclusion

The adoption of more frequent and systematic TB screening, including reducing the interval to 14 days upon prison entry, has proven crucial in enabling early detection and effective containment of TB within correctional facilities. The integration of chest X-rays and other diagnostic tools has improved case confirmation accuracy, facilitating prompt treatment initiation (Haeusler et al., 2022). These measures, combined with comprehensive healthcare strategies such as active case finding, quarantine protocols, and immediate treatment, have resulted in high treatment success rates in prisons (Kelemework et al., 2019). This integrated approach not only enhances individual health outcomes but also significantly reduces TB transmission risks in densely populated prison environments (Dara et al., 2015; Lange et al., 2018).

However, the observed variability and slightly lower success rates in the community highlight persistent challenges related to treatment adherence and access outside correctional settings. Addressing these issues requires ongoing efforts to strengthen community-based TB control programs, improve diagnostic and treatment services, and confront social determinants that contribute to TB spread (Martinez et al., 2023).

Overall, targeted screening, rapid diagnosis, and effective treatment within prisons demonstrate a viable model for TB control that can contribute to broader public health goals. Sustaining and expanding these initiatives are essential for further reducing TB prevalence both within correctional facilities and in the wider community.

The Pahurat's BathTub Approach (PBA) offers a comprehensive framework for health management in correctional settings through systematic assessments at key stages—intake, during detention, and pre-release. By classifying inmates into three health statuses—Cold Water, Warm Water, and Hot Water—the model enables targeted interventions that promote prevention, ongoing care, and treatment for undiagnosed infections. Maintaining prisoners in the Cold Water category underscores the importance of addressing social determinants of health to prevent disease progression (Taisuwan & Chotthanapund, 2025). Regular screening with chest X-rays, prompt treatment of identified abnormalities, and re-screening before release support a proactive, staged strategy that aims to sustain a healthy prison population and facilitate successful reintegration.

Future research should focus on evaluating the effectiveness of the PBA in reducing disease transmission, improving health outcomes, and supporting reintegration, while also exploring strategies to mitigate social factors influencing health within correctional populations.

Lastly, His Majesty King Maha Vajiralongkorn Bodindradebayavarangkun's leadership—embodying the legacy of compassion established by his father—has significantly advanced prison healthcare through the Royal "Good Health, Good Heart" project launched in December 2019 (Ministry of Justice, 2024). This initiative has enhanced healthcare infrastructure, including biomolecular laboratories, portable X-ray machines, and PPE, thereby strengthening TB prevention and control efforts. By striving for near-complete coverage, especially among new arrivals, and emphasizing the importance of addressing social determinants of health, this program aligns with the national goal to "End TB by 2030" (World Health Organization, 2021). These efforts exemplify a holistic approach to healthcare equity and disease control within correctional settings.

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Beyond Textual Boundaries: Innovative Practices in Contemporary East Asian Textual Art

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Abstract

This research investigates the transformation of textual elements in experimental calligraphy and visual poetry in East Asia from the 1960s to the present, examining their transition from traditional written symbols to contemporary artistic imagery. Drawing on Kohei Sugiura's "Three Stages of Textual Spirit" theory (symbolic, imagistic, and spiritual) from his work "The Spirit of Text" the study explores how artists break conventional textual boundaries to forge new visual languages. Through comparative methodology, this work examines key pieces from Japan's Concrete Poetry movement and Chinese experimental calligraphy, illuminating East Asian textual art's development within a global framework. Two fundamental questions guide the research: first, how experimental calligraphy and visual poetry establish novel artistic expressions by deconstructing and reconfiguring traditional text; second, how these innovative approaches mediate between modernity and indigenous cultural traditions. The research contributes fresh theoretical perspectives to contemporary East Asian textual art discourse while exploring the creative potential of text in cross-cultural artistic endeavors.

Keywords: East Asian textual art, visual poetry, experimental calligraphy, Sugiura's Three Stages, textual deconstruction

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Research Background and Motivation

The researcher's engagement in graphic visual design and layout since 2019 has fostered a profound interest in the visual presentation of text within diverse cultural contexts. Practical design experience frequently prompted reflections on how to integrate the formal language and cultural connotations of text to achieve both meaning conveyance and perceptual stimulation in visual compositions. These experiences shifted the focus from text as a mere linguistic carrier to its potential as a manipulable symbolic element within visual culture.

Figure 1

Wu Rong-di's "Family Admonitions of Zeng Guofan", Four-Panel Screen (1931)

Note. This four-panel work, measuring 130.5 × 34.8 cm each, is part of the collection at Taoyuan Museum of Fine Arts. Photo by ANPIS FOTO Wang Shih-Pang. Image courtesy of Taoyuan Museum of Fine Arts.

Figure 2

Huang Hua-Cheng, "Theatre Magazine"

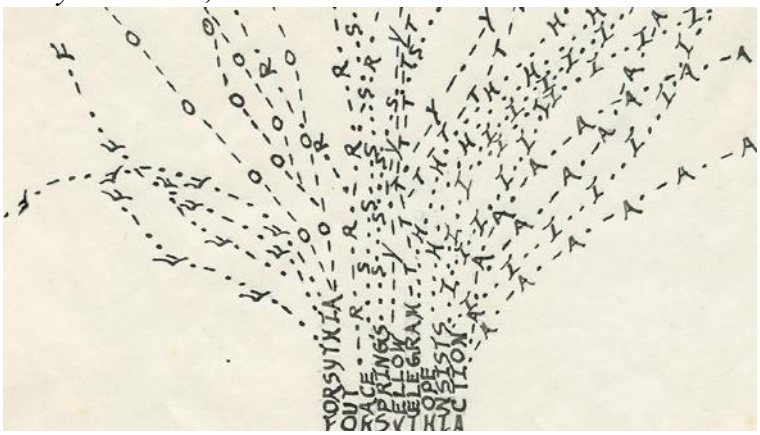
Note. This image showcases Huang's experimental approach to typography and layout, characterized by the disruption of conventional readability and the emphasis on text as a visual and spatial element. From BIOS Monthly, The Forgotten Prophet in the Margins of History: Huang Hua-Cheng's Anti-Art and Artistic Return (2021).

Concurrently, the researcher's Japanese language background, coupled with familiarity with the structural distinctions among Hiragana, Katakana, and Kanji, has cultivated a strong interest in the application of text within East Asian linguistic systems. For instance, the semantic shift of the term "新聞" (newspaper) in Chinese and Japanese contexts exemplifies

the intimate connection between linguistic systems and cultural cognition. This observation further prompted the researcher to consider: when text detaches from its grammatical and semantic functions to transform into a purely visual form, how does it reconstruct meaning and evoke viewing experiences? And how does it, as a component of contemporary art, challenge our understanding of language and expression?

Figure 3

Mary Ellen Solt, "American Concrete Poet"



Note. This image presents the poet and critic known for her significant contributions to concrete poetry, particularly through her influential anthology, Concrete Poetry: A World View. From Mary Ellen Solt, by Venezianews.it (n.d.). Retrieved from https://venezianews.it/en/who/mary-ellen-solt/

With this deepening interest in textual art, the researcher further focused during graduate studies on how text, as a medium in contemporary art, participates in the articulation of thoughts, emotions, and culture. Particularly, forms such as Visual Poetry, Concrete Poetry, experimental calligraphy, and Conceptual Art demonstrate that text has transcended linguistic boundaries, becoming a perceptible and manipulable artistic material. It serves as a vehicle for cultural critique, bodily action, and the intertwining of perception.

Within this context, the research investigates how East Asian artists challenge the boundaries among "text," "language," and "art" through the deconstruction and recomposition of textual elements. By employing strategies such as semiotic translation, spatial arrangement, and cultural displacement, text becomes a core medium for responding to the tensions between modernity and indigenous cultures, thereby forging trans-contextual visual forms of expression.

This study integrates Kohei Sugiura's "Three Stages of Textual Spirit" theory, the critical perspective of Conceptual Art on language and signs, and the theoretical propositions of Concrete Poetry and Visual Poetry concerning the spatial manipulation of text. This framework constructs a composite analytical approach applicable to contemporary East Asian textual art:

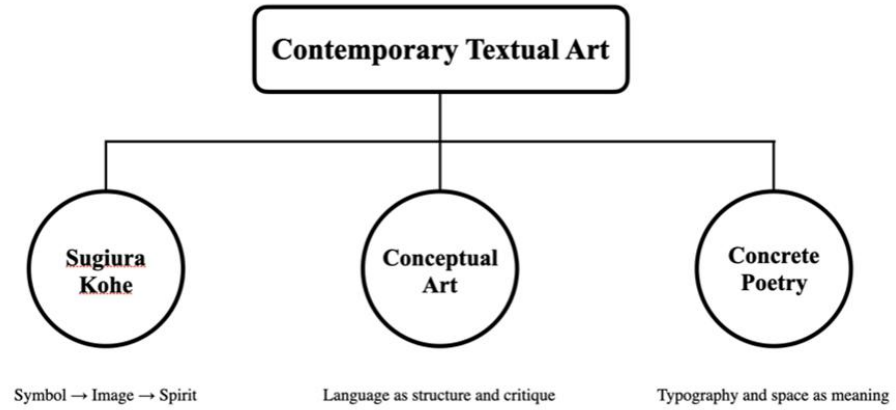
- **Sugiura Kohei's Theory of "Symbolic–Imagistic–Spiritual":** Provides a culturally profound perspective for observing the evolution of text, revealing its trajectory from functional symbol to artistic image.
- **The Critical Perspective of Conceptual Art:** Guides us to focus on the underlying thought processes and linguistic institutions behind artistic actions, prompting the act of writing to transform into a vehicle for cultural critique.
- **The Spatial Theory of Concrete Poetry and Visual Poetry:** Emphasizes "typographical space as structure" and "non-linear narrativity," breaking free from the

linear sequence of language and shifting towards dynamic spatial and visual construction.

This study considers these three elements as interconnected axes of inquiry: Kohei Sugiura's theory provides the cultural depth, Conceptual Art serves as the critical logical fulcrum, and visual poetics offers the spatial formation strategy. Together, they form a multi-layered analytical framework ("viewing mechanism" or "interpretive lens") to dissect how contemporary East Asian artists develop new manifestations of visual language through textual practices.

Figure 4

Conceptual Framework of Textual Art Analysis: Integrating Sugiura Kohei's Theory, Conceptual Art, and Visual Poetics



Note. This diagram illustrates the interrelationship among Kohei Sugiura's Theory of "Symbolic–Imagistic–Spiritual," the Critical Perspective of Conceptual Art, and the Spatial Theory of Concrete and Visual Poetry, forming a multi-layered analytical framework for contemporary East Asian textual art.

Research Questions

Based on the aforementioned research background and theoretical concerns, this study employs a comparative analysis approach. Through textual analysis and the comparison of art works, it investigates how East Asian artists utilize text as a visual element and develop new visual languages through forms such as Visual Poetry, Concrete Poetry, and experimental calligraphy.

In alignment with Kohei Sugiura's "Three Stages of Textual Spirit" theory, this study proposes two core research questions:

Core Research Questions

Question 1: The Visual Transformation Mechanism of Text

How do East Asian artists develop new artistic forms of expression by deconstructing and reconfiguring traditional text, thereby breaking through the linguistic boundaries of symbols? How does this transformation process embody the evolutionary stages of "symbolic–imagistic–spiritual" as articulated by Kohei Sugiura?

Question 2: Response Strategies to Modernity and Local Culture

How do these experimental textual art practices, through visual strategies, respond to the tension between modernity and local culture? As a cross-cultural medium, how does text embody and reinterpret East Asian cultural characteristics within a globalized context?

Specific Dimensions of Inquiry

To comprehensively address the core questions outlined above, this study will conduct its analysis from the following three dimensions:

1. **Formal Innovation Dimension:** How does the visuality of text in Visual Poetry and Concrete Poetry transcend the grammatical structure of language, exhibiting non-linear modes of expression?
2. **Cultural Fluidity Dimension:** As a visual language, how does text reflect the fluidity of language and the transformation of symbols within East Asian culture?
3. **Cross-Cultural Practice Dimension:** How does East Asian textual art, within a globalized context, develop visually distinctive forms of expression with local characteristics?

The Symbolism of Calligraphy and East Asian Culture

During the geopolitically tense 1960s, East Asia (Japan, Taiwan, China, and Korea) was profoundly impacted by the political opposition of the two major blocs, the United States and the Soviet Union, leading to heightened ideological divisions and social unrest. Amidst political suppression and societal transformation, many artists began to address issues of poverty, war, and politics, using their works to respond to the era. Concurrently, modern art concepts emerged, prompting artists to explore non-traditional media, including video art, installation art, and even integrating calligraphy with contemporary visual arts to forge new avenues of expression.

Prior to this period, while calligraphy possessed artistic qualities, it primarily served practical writing functions and upheld traditional literati aesthetics, not yet fully integrated into the “contemporary art” discourse shaped by Western modern art movements. Calligraphic works at that time largely emphasized technical refinement and traditional continuity, with creations often constrained by historical and cultural norms, thus lacking substantial dialogue with modern art currents. However, calligraphy, as a core symbolic system of East Asian culture, carries profound historical implications. Since the Wei and Jin Dynasties, calligraphy had progressively moved beyond pure utility, shifting towards an emphasis on personal style and emotional expression, with textual forms becoming a medium for conveying feelings and thoughts.

With the influx of global art trends and the shift towards contemporary visual culture, the artistic context of calligraphy began to expand. The British art critic Herbert Read (1931) once noted that art is not merely visual or plastic expression but also encompasses diverse forms like literature and music, emphasizing that the essence of art lies in the expression of thought and emotion. This perspective inspired contemporary East Asian artists to reconsider calligraphy's mediality and transmedia potential, enabling it to become a significant element in the practice of Conceptual Art, installation art, and even Visual Poetry.

To further understand how calligraphy transforms between tradition and contemporaneity, this study will apply Kohei Sugiura's (1996) *"Three Stages of Textual Spirit"* theory as a theoretical framework, analyzing its symbolic and artistic changes across the following three levels:

- Symbolic: Calligraphic characters, as symbolic carriers, bear specific cultural backgrounds and encoded meanings through their structure and style.
- Imagistic: The spatial composition between strokes, the dynamics of brushwork, and the overall composition generate visual imagery that transcends semantic layers, evoking perception and emotional resonance in the viewer.
- Spiritual: Through calligraphic practice, artists internalize personal thoughts, cultural interpretations, and contemporary consciousness into their works, forming a spiritual dimension that extends beyond the symbolic and imagistic.

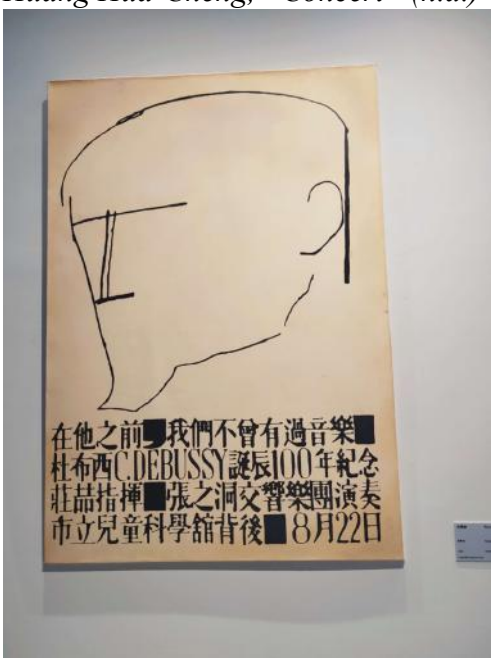
Through this three-tiered analysis, this study can not only gain a deeper understanding of the transformation process of East Asian textual art within the contemporary art field but also observe how artists expand the possibilities of calligraphy as a contemporary visual language through the deconstruction and recombination of symbols.

The Deconstruction of Calligraphy: From "Writing" to "Form-Making"—A Case Study of Huang Hua-Cheng

Traditional calligraphy has long emphasized writing techniques, character structure, and personal style in brushwork, serving as a vehicle for cultural transmission and aesthetic cultivation. However, with the introduction of modern art concepts, calligraphic practice began to break free from the confines of writing techniques, evolving towards more plastic and visual forms of expression. This blurred the boundary between "readability" and "visibility," opening up a new type of scriptural space situated between language and image.

Figure 5

Huang Hua-Cheng, "Concert" (n.d.)



Note. This work exemplifies Huang's pioneering approach to visual poetry, where text is not merely read but seen as a dynamic graphic composition. From The Room Life, Huang Hua-Cheng (n.d.). Retrieved from https://theroomlife.com/huang-hua-cheng/

Huang Hua-Cheng's Experimental Calligraphic Practice

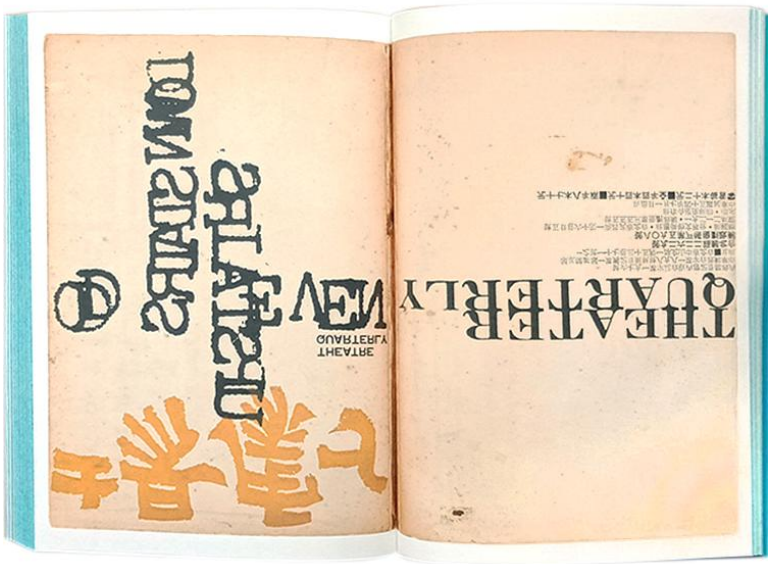
The work of Taiwanese artist Huang Hua-Cheng (1935–1996) in the 1960s provides a crucial case study for understanding the transformation of East Asian calligraphy from traditional writing to contemporary art. As the founder of *Theatre* magazine and a significant promoter of modern art in Taiwan, Huang Hua-Cheng's artistic experiments demonstrated strong cross-media characteristics. Calligraphy and text became his core means of challenging traditional aesthetics and cultural authority. He treated Chinese characters as manipulable visual elements, reconstructing calligraphy's linguistic, spatial, and spiritual dimensions through arrangement, deconstruction, and cross-media experimentation.

Visual Experimentation With Text

In his *Textual Composition* series, Huang Hua-Cheng boldly deconstructed and recomposed Chinese characters, liberating their original linguistic function and transforming them into purely visual elements. These textual forms no longer conveyed fixed semantics but entered the visual art context through their formal qualities, demonstrating the openness and polysemy of textual symbols. This prompted viewers to oscillate between reading and seeing. This operation echoes Ferdinand de Saussure's (1983) revelation of the arbitrary nature of the "signifier/signified" and responds to Jacques Derrida's (1978) emphasis on the concept of *différance*—where the meaning of text no longer originates from fixed referents but is continuously generated through the slippage of the signifier. In Huang Hua-Cheng's creations, characters were fragmented, recombined, and displaced, preventing viewers from deriving meaning through linear reading. Instead, meaning required visual perception for reconstruction, thereby embodying the fluidity and instability inherent in language itself.

Figure 6

Huang Hua-Cheng, Experimental Book Design From "An Open Ending"



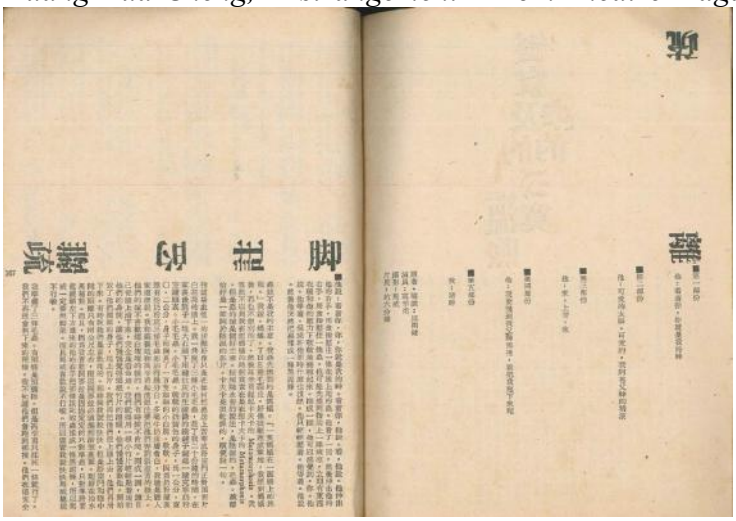
Note. This image illustrates Huang's radical approach to textual layout, where elements are fragmented and reconfigured to challenge conventional reading, transforming text into a dynamic visual composition. From Taiwan Art To Go, An Open Ending: Huang Hua-Cheng (n.d.). Retrieved from https://www.taiwanarttogo.com/products/preorderan-open-ending-huang-hua-cheng

Deconstructing the Authority of Traditional Calligraphy

In the layout design of *Theatre* magazine, Huang Hua-Cheng employed non-traditional arrangements such as horizontal writing, slanted alignment, and circular arrangements, breaking the habitual formats of Chinese script. This visual subversion was not merely an innovation in design technique but also a critique of calligraphic tradition and cultural power structures. As stated in the inaugural concept of *Theatre* (Huang, as cited in Chiang, 2020), "We want to create new forms of expression, so that text is no longer just a tool for carrying meaning, but an artistic element with independent vitality." Huang Hua-Cheng utilized layout strategies such as obscuring paragraphs with black blocks and disrupting character spacing, thereby making viewers co-creators in the reading process rather than passive recipients of meaning. Reading, in this context, ceased to be a decoding act and transformed into participation in a visual experience where language and image interwove.

Figure 7

Huang Hua-Cheng, "Estrangement" From Theatre Magazine



Note. This image exemplifies Huang's radical manipulation of text, where characters are fragmented and spatially dislocated to create a sense of estrangement and challenge conventional linear reading, emphasizing the visual form over semantic content. From BIOS Monthly, The Forgotten Prophet in the Margins of History: Huang Hua-Cheng's Anti-Art and Artistic Return (2021). Retrieved from https://www.biosmonthly.com/article/10669

Practice as Linguistic Action

Beyond experiments in typography and composition, Huang Hua-Cheng concretely integrated language and the body in a 1965 performative installation. He exhibited an installation composed of school desks, mannequins, and a tombstone on the streets of Ximending, Taipei. After being dispersed by the police, he relocated to continue the performance beneath the Fu Bell at National Taiwan University. This action involved no recitation of poetry, yet it presented a self-standing tombstone inscribed with "No urinating or defecating here." This phrase, superficially absurd, in fact, through contextual displacement, stimulated the audience's contemplation on the public nature of language. Here, language ceased to exist merely as a symbolic system and transformed into a spatial event and bodily practice, becoming an extended act of the scriptural entity itself.

The Transformative Process From Symbolic to Spiritual

Applying Kohei Sugiura's (1996) "Three Stages of Textual Spirit" theoretical framework from *The Spirit of Text*, Huang Hua-Cheng's practice can be viewed as a quintessential case of calligraphic language transformation:

Symbolic Layer: While retaining the basic structure of Chinese characters, allowing viewers to recognize their Chinese origin, Huang Hua-Cheng broke the stable relationship between text and meaning through deconstruction and recombination.

Imagistic Layer: Through non-traditional spatial arrangement and composition, text became a purely visual image. Its strokes and structures transformed into a plastic language, stimulating viewers' perception and emotional resonance.

Spiritual Layer: Huang Hua-Cheng infused his personal reflections on modernity and his consciousness of cultural critique into his calligraphic experiments, elevating the works beyond mere visual interest to become profound responses to traditional culture and the structure of modern society.

Innovative Application of Material Language

Huang Hua-Cheng's emphasis on "material language" also constitutes a significant characteristic of his experimental calligraphic practice.

Figure 8

The 1966 "Modern Poetry Exhibition" in Taipei

Note. This photograph captures the ephemeral installation, initially planned for Ximending and later relocated to National Taiwan University, featuring works by artists like Huang Hua-Cheng, Long Ssu-liang, Huang Yung-sung, and Chang Chao-tang.From Taiwan International Documentary Festival, In the Form of a Human Landscape (n.d.). Retrieved from https://www.tidf.org.tw/zh-hant/films/63935

He integrated text into heterogeneous media such as installations, publications, and layouts. Through printing traces and the interplay of text and image, he achieved a material re-shaping of calligraphy, breaking through the material limitations of traditional brush-and-ink writing and endowing calligraphy with a new material syntax. This cross-media practice demonstrates the response strategies of Taiwanese modern art in the globalized context of the 1960s, further embedding calligraphy within the vocabulary of contemporary art.

Defining Diverse Case Studies and Positioning Huang Hua-Cheng

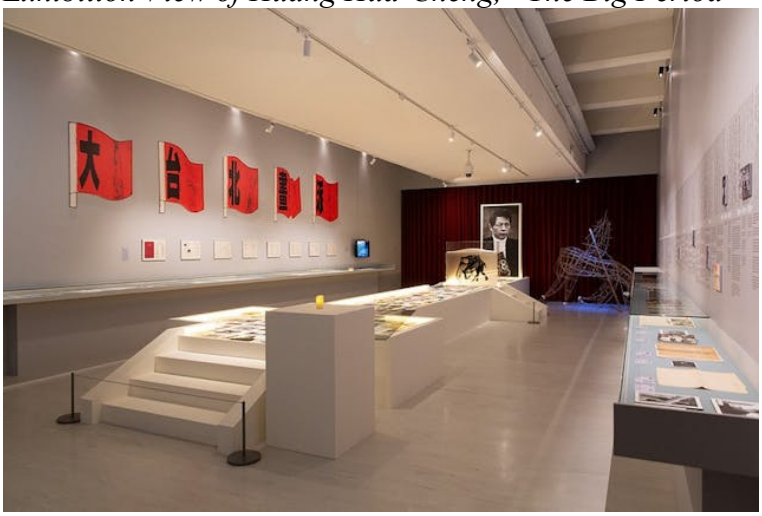
Through the case study of Huang Hua-Cheng, it can be observed that the deconstruction of contemporary calligraphy is no longer merely a formal innovation. Instead, it encompasses a comprehensive practice that includes cultural identity, the experience of modernity, and the reconstruction of artistic language. His works demonstrate the potential for calligraphy, as a symbolic system, to be reinterpreted and reshaped, embodying the cross-media and concept-driven creative trends in contemporary art.

Furthermore, Huang Hua-Cheng's practice helps define the scope of this study's core concept— "diverse case studies of contemporary East Asian calligraphy":

- **"East Asia":** Refers to regions centered around the Chinese character cultural sphere, including China, Japan, Korea, and Taiwan. Although calligraphic traditions vary in style across these regions, they all share Chinese characters as a common cultural symbolic system and artistic expressive tradition.
- **"Contemporary":** Denotes the time frame from the 1960s to the present. During this period, calligraphic creation has transcended the aesthetic framework of traditional literati styles, actively incorporating modernism and contemporary art vocabulary, showcasing experimental and interdisciplinary creative characteristics.
- **"Calligraphy":** Although undergoing deconstruction and recomposition, it still utilizes brushwork and character forms as core carriers for symbolic operations. In the contemporary context, calligraphy has expanded to encompass artistic practices involving visual form-making, spatial composition, and media experimentation.
- **"Diverse Case Studies":** Refers to calligraphic creation practices undertaken by artists across various East Asian regions using different strategies. These include, but are not limited to, diverse forms of expression such as linguistic deconstruction, visual form-making, corporeal writing, and cross-media experimentation, thereby shaping a rich and heterogeneous landscape of contemporary calligraphic practice.

Figure 9

Exhibition View of Huang Hua-Cheng, "The Big Period"



Note. This image captures a scene from Huang Hua-Cheng's "farewell exhibition" held during his lifetime, which conceptually served as his own funeral. From Bo Wu Zhi Dao Editorial Team, The Forgotten Prophet in the Margins of History: Huang Hua-Cheng's Anti-Art and Artistic Return (2021). Retrieved from https://www.tmaroc.org.tw/2021-article01/

Huang Hua-Cheng is one of the representative figures among these. His experimental calligraphic practice not only mirrors the cultural exploration within Taiwan's modern art context of the 1960s but also resonates with the cross-regional and cross-media development trends of contemporary East Asian calligraphy, serving as a crucial entry point for understanding the transformation of contemporary calligraphy.

The Visual Poeticization of Calligraphy: From Writing to Arrangement

In contemporary East Asian calligraphic practice, text has evolved from “form-making” towards more structural and spatial arrangement strategies, gradually forming an artistic trend in dialogue with Visual Poetry. The visual poeticization of calligraphy not only involves transformations in textual forms but also focuses on how language generates new reading experiences and poetic meanings through spatial composition. This visual poeticization fundamentally questions the relationship between language and meaning, emphasizing the dynamic generation of text within typography, composition, and reading rhythm. Viewers no longer “read” language in a linear fashion but “participate” in the visualization process of language through spatial perception.

Compared to the formal experiments discussed in the “diverse case studies” of East Asian calligraphy, visual poeticization shifts towards a more macro-level aesthetic of arrangement, forming a cross-cultural creative dialogue with the international Concrete Poetry movement. The theoretical framework of visual poetics provides a crucial reference system for contemporary East Asian calligraphic arrangement practices, enriching the cultural context of contemporary calligraphy's cross-media transformation.

The Concrete Poetry movement, which emerged in the 1960s, provided a crucial international context for understanding the visual poeticization of calligraphy. As Mary Ellen Solt (1970) noted in *Concrete Poetry: A World View*, “Concrete poetry is international not because it is translated, but because it is built.” This perspective emphasizes a shift in poetics from semantic centrality to spatial construction, where the poem becomes a viewable artifact, and the interplay of typography and image constitutes the core of poetic practice. This shift resonates with Jacques Derrida's (1978) concept of the “slippage of the signifier” in language—when semantics become unstable, typography and composition, conversely, become the fulcrum for new poetic structures.

The aesthetic of Concrete Poetry is founded on two principles: Typographical Space as Structure, meaning that the layout space itself constitutes the structural logic of the poem; and Non-linear Narrativity, where poetic lines break free from temporal sequence, guiding the viewer's reading experience through visual rhythm.

Figure 10

Augusto de Campos and Julio Plaza, "Poemobiles" (Detail), 1974

Note. From Artsy, Augusto de Campos: Poemobiles (Detail) (n.d.). Retrieved from https://www.artsy.net/artwork/augusto-de-campos-poemobiles-detail

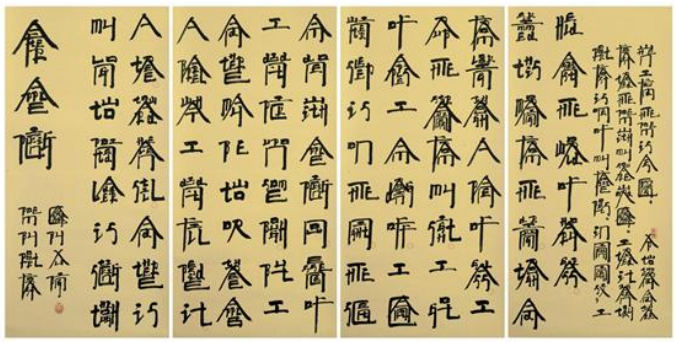
Visual Logic of Arrangement Techniques

Compared to the formalization of calligraphy, arrangement strategies place a greater emphasis on the spatial relationships and visual organization among textual elements. In the process of visual poeticization, East Asian calligraphy exhibits several typical arrangement characteristics:

- **Subjectification of Space:** Space is no longer merely a background for text but an active element in the generation of meaning. Through the design of whitespace, character spacing, and line spacing, artists create tension and a sense of breathing.
- **Multi-directional Reading Paths:** Breaking the traditional writing patterns of Chinese characters, diverse arrangement methods (such as radial or spiral) are employed to guide viewers in constructing meaning through visual exploration.
- **Rhythm and Cadence:** By varying the density of text and the strength of brushstrokes, a visual sense of rhythm is created, imbuing the static image with dynamic temporality.

Figure 11

Xu Bing, "Robert Frost After Apple Picking" (2011)



Note. This work, rendered in water-based ink on grass paper, showcases Xu Bing's "Square Word Calligraphy" system, which transforms English text into a visual form resembling traditional Chinese characters. It prompts viewers to re-engage with the act of reading and exemplifies the artist's exploration of linguistic and cultural boundaries through visual art. From CAFA Art Museum, Xu Bing's Solo Exhibition "Between Heaven & Earth" Opened at CAFA Art Museum (2022, December 26). Retrieved from https://cafa.com.cn/en/news/details/8321630

Case Analysis: Spatial Poetics From Xu Bing to Gu Wenda

Xu Bing's *Book from the Sky* (1987–1991) series employs large-scale typography of pseudo-Chinese characters, creating a visual context that is both familiar and alien. Confronted with these meaningless yet highly character-like images, viewers are compelled to enter a non-linguistic state of reading. This "reading frustration" prompts viewers to shift from semantic comprehension to visual immersion, serving as a quintessential example of the visual commodification of language. His extensive compositional strategy transforms calligraphic works into a practical field of Spatial Poetics.

Gu Wenda's *Mythos of Lost Dynasties* series, conversely, utilizes the flow of ink and the random distribution of fragmented text to create a poetic space reminiscent of an archaeological site. Blurred and fragmented characters become metaphors for temporality and cultural memory, transforming the visual reading process into an act of interpreting history and symbols.

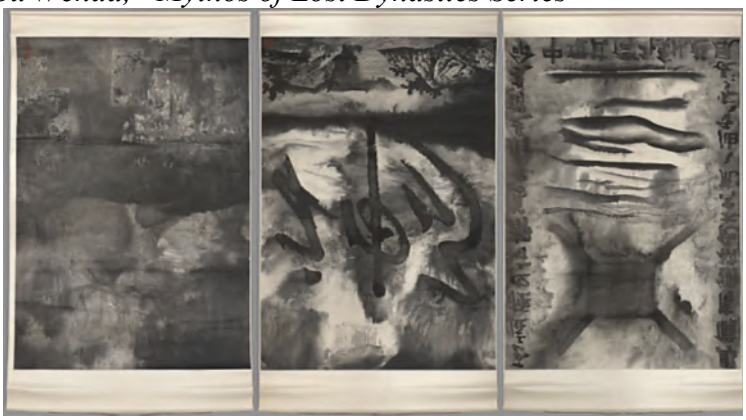
Figure 12

Xu Bing, "Book From the Sky" (1987–1991)

Note. This monumental installation features thousands of invented, unreadable Chinese characters, challenging viewers' conventional understanding of language, meaning, and cultural authenticity. From The Blanton Museum of Art, Xu Bing: Book from the Sky (n.d.). Retrieved from https://blantonmuseum.org/exhibition/xu-bing-book-from-the-sky/

Figure 13

Gu Wenda, "Mythos of Lost Dynasties Series"



Note. This work explores themes of cultural memory, linguistic fragmentation, and historical remnants through the interplay of blurred ink and deconstructed Chinese characters, evoking an archaeological aesthetic. From The Metropolitan Museum of Art, Gu Wenda: Mythos of Lost Dynasties: The Fall of Icarus (n.d.). Retrieved from https://www.metmuseum.org/art/collection/search/77530

The visual poeticization profoundly alters the traditional definition of "reading" as a semantic act, transforming it into a sensory engagement and spatial operation:

- **From Linear to Networked:** The reading path shifts to a non-linear network, where viewers must navigate the page, actively seeking visual rhythm and meaning.
- **From Understanding to Experience:** The focus of reading moves from "deciphering meaning" to "perceiving space," with visual perception becoming a crucial dimension of poetic generation.
- **From Individual to Participatory:** The viewer's eye movement and participation become dynamic elements in the generation of poetic meaning, enhancing the interactivity of the work.

This transformation in reading experience responds to the concept of "interface semiotics" in contemporary semiotics (Pan, 2021)—where text is no longer interpreted as static content but generates meaning through interaction as a dynamic interface.

Significance of Cross-Cultural Poetic Dialogue

The practice of visually poeticizing East Asian calligraphy has not only expanded calligraphy's own artistic grammar but has also forged a cross-cultural dialogue with the international Concrete Poetry movement. Building upon the cultural specificities of East Asian calligraphy, such as brush-and-ink techniques and the structure of Chinese characters, it has absorbed and transformed the spatial poetics concepts of Concrete Poetry. This integration presents an artistic style that simultaneously possesses cultural distinctiveness and openness to international contexts.

Within a globalized context, this cross-cultural poetic dialogue not only enriches the artistic vocabulary of contemporary calligraphy but also offers new avenues for the construction of contemporary cultural identity. As a medium for visual poetics, calligraphy demonstrates a powerful capacity for cultural self-renewal in contemporary East Asian art, establishing itself as an undeniable innovative force in global artistic discourse.

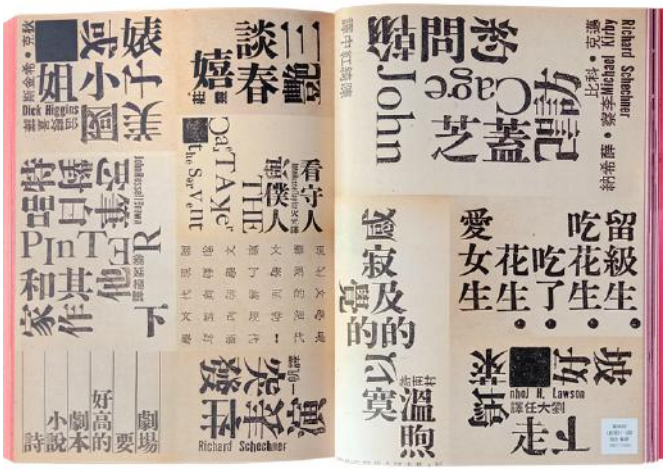
Research Methodology: Comparative Analysis Centered on Huang Hua-Cheng

This study employs a comparative analysis approach, focusing on the calligraphic and visual poetic practices of Taiwanese artist Huang Hua-Cheng. Through a case study of Huang Hua-Cheng and a comparison with the practices of Chinese artists Xu Bing and Gu Wenda, the research aims to deepen the understanding of contemporary East Asian textual art and Huang Hua-Cheng's visual language strategies

The analysis in this chapter will proceed along three levels:

1. Deconstruction and Transformation of Linguistic Structure: Examining how the readability of text and the mechanism of semantic transmission are transformed.
2. Layout and Arrangement Strategies: Analyzing how text enters visual poetics, transforming into images and spatial structures.
3. Translation and Intervention in Cultural Context: Focusing on how artists, through linguistic operations, respond to social, historical, and cultural identity.

Figure 14
Huang Hua-Cheng, "Black Block Poem"



Note. This work demonstrates the artist's radical experimentation with textual disruption, where blocks of black obscure segments of text, challenging traditional readability and highlighting the visual materiality of language. From An Open Ending: Huang Hua-Cheng (p. 88), by Chiang, H. (Ed.), 2020. Copyright 2020 by Taipei Fine Arts Museum.

Huang Hua-Cheng: Poetic Strategies From Linguistic Interference to Cultural Arrangement

Huang Hua-Cheng's prolific work spanned text, poetry, design, and performance art. His linguistic experimentation transcended mere formal exploration, profoundly engaging with the institutional and cultural dimensions of language. He extracted text from its linguistic system, transforming it into visual structures and critical symbols. For instance, in his black block poems and in *Theatre* magazine, he extensively employed techniques such as obscuring, line breaks, misplacements, horizontal writing, and repeated characters. These methods disrupted grammatical coherence, causing the text to enter a state of being "viewed" rather than "read."

Huang Hua-Cheng's poetic concerns were also manifested in his strategy of contextual displacement. A notable example is his 1965 performance art piece where he used a self-standing tombstone inscribed with "No urinating or defecating here." This act transformed public language into a personal ritual, shifting language from a purely functional role to a symbolic action. This displacement strategy detached text from its social function, allowing it to become a poetic device imbued with corporeality and temporality.

Comparison With Xu Bing: From Anti-Semantics to the Construction of Visual Logic

Compared to Huang Hua-Cheng's contextual displacement and grammatical disruption, Xu Bing's *Book from the Sky* (1987–1991) undertakes a more thorough semantic detachment. Xu Bing created a vast quantity of unreadable "pseudo-Chinese characters" and employed a neat typographic layout mimicking the format of ancient texts, compelling viewers to focus on the form of writing amidst the failure of reading. This operation, where one "understands the form but not the content," echoes Huang Hua-Cheng's semantic obscuration.

However, a key difference remains in their strategies toward language: Xu Bing handles text with massiveness and homogeneity, pursuing structural aesthetics and visual consistency. Huang Hua-Cheng, conversely, emphasizes semantic fragmentation, rhythmic disorder, and

visual interruption, more akin to an improvisational rhythm of arrangement and viewing. Huang Hua-Cheng's practice more closely resembles "poetic aftershocks following the dissolution of language," constructing poetic fissures and seams through rupture and redirection.

Comparison With Gu Wenda: From Installation Perception to Cultural Archaeology

Gu Wenda's *Mythos of Lost Dynasties* series constructs an installed language of cultural memory through blurred ink traces, fragmented characters, and historically imbued symbols. He integrates calligraphy with archaeological imagery, rendering language not as a "description" of history, but as its "remnant." Viewers do not decipher, but rather observe, surmise, and infer the origins and meanings of the text.

Huang Hua-Cheng also engaged with the relationship between language and history, yet his emphasis lay more on the subversion of contemporary contexts. He did not simulate historical memory but directly extracted vocabulary from social language (such as slogans and public notices) for appropriation and ironic re-configuration. Thus, Gu Wenda's linguistic operation represents a historical distance and residual perception, whereas Huang Hua-Cheng's signifies an immediate intervention and cultural displacement. Huang Hua-Cheng's approach is more anti-timely and direct, aligning more closely with the strategic practices of anti-cultural poetics and language theater.

Through comparative analysis, it is evident that both Xu Bing's typographic visual poetics and Gu Wenda's cultural memory installations demonstrate the transformative potential of text as a visual element. However, Huang Hua-Cheng's creations possess a tripartite characteristic of linguistic interference, typographic disruption, and contextual provocation, positioning him uniquely within visual poetics. His act of writing is not merely a deconstruction of linguistic form but an ongoing protest against linguistic order and cultural discourse.

Huang Hua-Cheng proposed a logic of writing that lies between poetry, design, and installation—a cultural strategy that liberates calligraphy from its reliance on brushwork, semantics, and structure. His practice proves that text need not be understood; it can also be viewed, engaged with, misread, and in these processes, construct poetic energy.

Figure 15

Huang Hua-Cheng, Untitled (detail) (n.d.)

Note. This image, likely a detail from one of Huang Hua-Cheng's experimental works, demonstrates his innovative approach to integrating text and visual elements, transforming characters into graphic forms that challenge conventional interpretation. From Taiwan Art To Go, An Open Ending: Huang Hua-Cheng (n.d.). Retrieved from https://www.taiwanarttogo.com/products/preorderan-open-ending-huang-hua-cheng

Conclusion

Through an analysis of diverse case studies in contemporary East Asian textual art, this research posits that contemporary East Asian textual practices are not merely simple transplantations of Western Conceptual Art. Instead, they are rooted in the cultural characteristics of Chinese character culture—namely, the "separation of form and meaning," "temporality of brushstrokes," and "visual expressiveness"—thereby developing visual poetic strategies with their own distinct contexts.

Through a comparative analysis centered on Huang Hua-Cheng, complemented by contrasting cases of Xu Bing and Gu Wenda, this study demonstrates that contemporary artists employ methods such as deconstruction, obscuration, displacement, and recomposition. These approaches drive a fundamental transformation of text from "readability" to "visibility," expanding the expressive scope of both calligraphy and poetics. The transformation of text across symbolic, imagistic, and spiritual layers has not only fostered new viewing experiences but has also enriched the creative vocabulary of contemporary East Asian art.

These artistic creations demonstrate East Asian artists' active responses to and reinterpretation of the contemporary context. They do not "withdraw" from language but rather transform it into a poetic space for viewing, questioning, deconstructing, and constructing. Semiotic displacement, semantic *différance*, and cultural trans-translation render text a perceptible, visible, and explorable composite sign, creating multi-layered, non-linear experiential interfaces for the viewer.

In a cultural environment interwoven with globalization and digitalization, the development of East Asian calligraphy and its visual poeticization offers new perspectives for contemporary visual culture studies. Future research could further explore the interactive relationship between calligraphy and digital media, as well as AI-generated texts, thereby expanding its possibilities in contemporary art and cultural practice.

Usage of Generative AI & AI-Assisted Technologies Statement

In the preparation of this manuscript, AI-assisted tools were utilized for English translation and text proofreading. Specifically, Google Gemini and ChatGPT were used to refine grammar, punctuation, and phrasing for clarity and conciseness, and to check for spelling errors.

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Entrepreneur as the Least Wanted Job Among Generation Z: The Role of Internal Locus of Control and Resiliency

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Abstract

In this study, low entrepreneurial intention among Generation Z was indicated by a preliminary survey on young people's preferred future occupations. Previous research showed that there is a research gap in the effect of internal locus of control on entrepreneurial intention. According to Social Cognitive Theory, individuals with an internal locus of control are better equipped to face crises and adapt to new conditions, which is closely related to resilience. Highly resilient individuals are able to thrive in difficult and challenging situations, traits that are important for entrepreneurs. Resilience can increase an individual's confidence in their intention to start a business. This quantitative cross-sectional study explores resilience as a mediator between the influence of internal locus of control and entrepreneurial intention. The population of this study were Generation Z in Denpasar, with a sample size of 379 participants selected using purposive sampling. The inclusion criteria were individuals aged 17 years and older who had not yet started any formal employment. Data were collected using Connor-Davidson Resilience Scale, Internal Locus of Control Instrument, and Entrepreneurial Intention Instrument. Path analysis was used to analyze the data. The results support the hypotheses, indicating that internal locus of control and resilience significantly influence entrepreneurial intention. Additionally, resilience significantly mediates the effect of internal locus of control on entrepreneurial intention. These findings suggest that fostering entrepreneurial intention can be achieved by providing challenging and self-motivating activities in schools and universities to help students build self-confidence and improve their ability to handle various situations effectively.

Keywords: entrepreneurial intention, resilience, internal locus of control, Generation Z

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Introduction

MSME are important economic pillar because the economic resilience of a developing country, especially Indonesia, is predominantly supported by the performance of MSMEs. So that sustainable MSMEs are the hope of all groups, both from the government, society, and MSME owners themselves. Since the Covid-19 outbreak phenomenon, it is hoped that many people will start choosing to become entrepreneurs because of the many layoffs that occurred during the crisis. With their decision to become entrepreneurs, they are able to determine the fate of their own businesses and can try to revive their businesses when a crisis occurs.

Gen Z is the youngest generation to enter the workforce who has different characteristics from Gen X and Gen Y. Gen Z are individuals born between 1997-2012 (Arum et al., 2023). Gen Z has the characteristic of not liking complex rules and is more likely to disengage or leave an organization when such regulations conflict with their personal values or preferences (Kusumawati et al., 2021). Those characteristics should make Gen Z prefer to work as entrepreneurs rather than being employees in a company, because basically entrepreneurs determine their own rules in running their business.

However, based on a preliminary study of 100 young people in Denpasar, Bali aged 19-24 years regarding their decisions about future jobs, 26% chose to become entrepreneurs, 40% chose to work in private companies, and the remaining 34% chose to become civil servants. This shows that entrepreneurial intention in Gen Z is still low in the preliminary study. Entrepreneurial intention refers to an individual's conscious aspiration or commitment to initiate a business venture in the future (Thompson, 2009). Before finally starting a business, someone must start with an intention to become an entrepreneur. Intention can arise from an interest in something particular.

To run a business that has many challenges, individuals must dare to view and solve problems in their business life as something they can control. This indicates that successful entrepreneurial activity requires an individual to possess a strong internal locus of control, reflecting the belief that outcomes are primarily determined by one's own actions and decisions. Internal locus of control allows individuals to be more courageous and innovative in taking risky steps in starting and developing their business (Ani & Kurniawan, 2023).

An internal locus of control refers to an individual's belief that the outcomes and events in their life are predominantly influenced by their own actions, decisions, and personal efforts, rather than by external forces (Hernandez et al., 2022). When an individual believes that he is the determinant of his own destiny, then the possibility of someone choosing a job as an entrepreneur will be higher.

H1: Internal locus of control has a positive effect on entrepreneurial intention.

Empirical studies have demonstrated a positive and statistically significant relationship between an internal locus of control and entrepreneurial intention (Auna, 2022; Nurdwiratno et al., 2023; Tentama & Abdussalam, 2020; Zulfa, 2021). However, there are studies that show different results, that internal locus of control does not significantly influence entrepreneurial intention (Tirtayasa et al., 2021). Because of this research gap, researchers have turned the attention toward identifying potential mediating variables that could clarify this relationship. Addressing this gap is crucial for developing a more comprehensive

theoretical framework and for designing targeted interventions aimed at fostering entrepreneurship.

According to Social Cognitive Theory, individuals with a strong internal locus of control are generally better equipped to face crises and adapt to new conditions, which is closely related to resilience. According to this theory, humans actively motivate and regulate their behavior while constructing social systems to organize, structure, and give meaning to their lives (Abdullah, 2019). Internal locus of control is a driver of the existence of individual abilities that will create resilience in individuals (Oktaviana, 2013). The ability of individuals to continue to rise despite experiencing difficulties is called resilience (Amelia et al., 2024). This is in line with the findings of Wulansari et al. (2024), Dipayanti and Chairani (2012), and Arsini et al. (2023) who have demonstrated that internal locus of control exerts a positive influence on resilience.

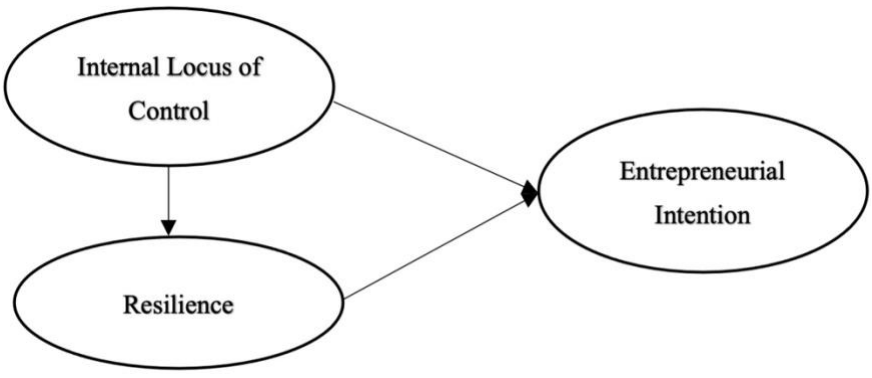
H2: Internal locus of control has a positive effect on resilience.

Resilience is a broad competency that encompasses the capacity for adaptive self-regulation and flexibility in response to both internal and external pressures (Farkas & Orosz, 2015). Resilience is related to emotional maturity. Individuals with high resilience have a positive self-image (Prawita & Heryadi, 2023). These individuals will certainly find it easier to deal with stressful situations that occur in their lives. Individuals with high resilience will view challenges at work as positive conditions that can make changes for the better. Meanwhile, individuals with low resilience will consider stressful work as something negative that makes them disturbed and uncomfortable. Entrepreneurship requires high resilience, because in order to build a sustainable business, individuals must be able to survive in difficult and challenging conditions. Individuals exhibiting high levels of resilience are more likely to demonstrate a stronger intention to pursue entrepreneurship. This finding aligns with prior research, which indicates that resilience has a significant positive impact on entrepreneurial intention (Sasmita & Afriyenti, 2023). Even though there are previous research findings that indirectly correlates internal locus of control, resilience and entrepreneurial intention, the role of resilience as mediating variable is rarely found as topic research. Therefore, researchers want to analyze how resilience mediates the effect of internal locus of control on entrepreneurial intention.

H3: Resilience has a positive effect on entrepreneurial intention.

H4: Resilience mediates the effect of internal locus of control on entrepreneurial intention.

Figure 1
Research Model



Methodology

This is quantitative cross-sectional research which studies about resiliency as mediator between the influence of internal locus of control to entrepreneurial orientation. Population of this research were Generation Z in Denpasar city with a total number of 177,322. Generation Z is individual who were born between 1997-2012. Minimum sample size of 270 were calculated using formula by Isaac and Michael (1981). The total of 379 samples were taken through purposive sampling method, with inclusion criteria of individuals aged 17 years and older who had not yet started any formal employment. Data were collected using questionnaires which consists of 25 items from Connor-Davidson Resilience Scale (CD-RISC), 10 items from Internal Locus of Control Instrument, and 6 items from Entrepreneurial Intention Instrument.

Resilience was measured by CD-RISC which consists of 25 items that measure the construct of resiliency. This scale was developed by Connor and Davidson (2003) and translated into Indonesian by Listyandini and Akmal (2015). The concept of resilience is comprised of 5 key elements, including personal competence, trust, positive acceptance, control, and spiritual influence (Connor & Davidson, 2003). Internal Locus of Control Instrument consists of 10 items, which measured by 5 aspects, such as strong work ethic, high levels of initiative, consistently seeks solutions to problems, think efficiently, and sustained effort and perseverance (Ghufron & Risnawita, 2010). Entrepreneurial intention assessed with instrument which consists of 6 items and 3 aspects of attitude, subjective norm, and perceived behavior control(Ajzen, 1991).

Table 1
Instrument's Validity and Reliability

Variable	Total Item	Pearson Correlation	Cronbach Alpha Coefficients
Resilience	25	0.334 – 0.689	0.873
Internal Locus of Control	10	0.681 – 0.840	0.920
Entrepreneurial Intention	6	0.320 – 0.932	0.872

To examine the relationships between the variables, path analysis was conducted on the data utilizing the Statistical Package for the Social Sciences (SPSS) software, which facilitated the estimation of direct and indirect effects within the proposed model. Before the data was analyzed, researchers tested the reliability and validity of all the three instruments through a pilot test with 30 respondents. It showed that Connor-Davidson Resilience Scale, Internal Locus of Control Instrument, and Entrepreneurial Intention Instrument were reliable instruments with Cronbach's alpha coefficients of 0.873; 0.920; and 0.872. The results of the validity test also showed that all items in the three instruments were valid because the correlation with the total score values are above 0.3 as can be seen in Table 1.

Results and Discussion

The results of the normality test, conducted using the Kolmogorov-Smirnov Test, yielded a significance value of 0.200. This value is above 0.05, which means that the distribution of residual data in this study is normally distributed. The results of the multicollinearity diagnostic test reveal that there is no significant multicollinearity present within the regression model of this study, suggesting that the independent variables are not highly correlated with one another because the results of data processing show a Tolerance value >

0.01, which is 0.545 and a VIF value < 10, which is 1.834. The results of the heteroscedasticity test, conducted using the Glejser Test, indicate the absence of heteroscedasticity, as the significance values for each variable exceeded the threshold of 0.05, with values of 0.546 and 0.919, respectively. After passing the classical assumption test, the data was then processed with path analysis.

Table 2
Relationship Between Variables

Variable Relationship	Significance Value	Beta
Internal Locus of Control to Entrepreneurial Intention	0.000	0.530
Internal Locus of Control to Resilience	0.000	0.674
Resilience to Entrepreneurial Intention	0.000	0.420

The testing of H1 reveals that internal locus of control exerts a positive and statistically significant effect on entrepreneurial intention, with a significance value of 0.000 ($p < 0.05$) and a beta coefficient of 0.530. These findings suggest that an increase in an individual's internal locus of control is associated with a corresponding increase in their entrepreneurial intention, indicating a direct positive relationship between the two variables. Internal locus of control is an individual's ability to interpret events that occur in their lives as a consequence of the individual's own attitudes and behavior. This characteristic makes individuals more innovative in determining their own destiny. Therefore, individuals possessing an internal locus of control are more likely to harbor entrepreneurial intentions as entrepreneurs are individuals with creative minds who are responsible for themselves to design how the company will run. Internal locus of control is believed to motivate individuals to take the initiative and take risks in entrepreneurship (Ani & Kurniawan, 2023). This finding is consistent with prior research conducted by Tentama and Abdussalam (2020), which indicated that entrepreneurial intention tends to rise when individuals are provided with entrepreneurship education that fosters key entrepreneurial traits, such as an internal locus of control. Furthermore, a comparative study among Indonesian and Norwegian students by Kristiansen and Indarti (2004) revealed that individuals with a strong internal locus of control are more likely to exhibit heightened entrepreneurial intention.

The testing of H2 reveals that internal locus of control has a positive and statistically significant effect on resilience, with a significance value of 0.000 ($p < 0.05$) and a beta coefficient of 0.674. This shows that a high internal locus of control in an individual makes him/her more resilient. Individuals who predominantly think using internal locus of control will certainly be better able to rise from adversity when facing stressful situations. This happens because individuals with internal locus of control will focus on things they can do to improve the situation rather than blaming circumstances or other external factors. This shows a high level of resilience in the individual. This is in accordance with (Hartini et al., 2023) research results which showed that internal locus of control allows individuals to take ownership of these events and their responses to them, enabling them to choose adaptive behavioral methods to deal with them in the moment. An individual with an internal locus of control possesses characteristics such as a positive outlook on their success, effective problem-solving abilities, a strong work ethic, and the capacity for critical thinking. These traits enable individuals to navigate challenges more effectively, enhancing their ability to recover and thrive following a crisis (Cazan & Dumitrescu, 2016). Previous study conducted

by (Felicia et al., 2022) also stated that internal locus of control has a positive and strong relationship with resilience among adolescents.

Testing of H3 shows that resilience has a positive and significant effect on entrepreneurial intention with a significance value of < 0.05, which is 0.000 and a beta value of 0.420. This shows that individuals who have high resilience will have high entrepreneurial intention. Individuals who can easily rise from adversity will be more confident in running a business as a business owner. Individuals must be able to solve problems and adapt to changes that occur so that the business they run can survive. Therefore, Generation Z who have high resilience will be more confident in deciding entrepreneur as the job they want to do in the future. This finding aligns with previous research by Emrizal and Primadona (2023), which demonstrated a positive and significant effect of entrepreneurial resilience on entrepreneurial intention. Similarly, Cruz et al. (2022) found that higher levels of resilience are associated with an increased perception of control over entrepreneurial intention. Additionally, other scholars, such as Bullough et al. (2014), have highlighted that resilience plays a crucial role in personal decision-making when entrepreneurs seek to overcome adverse economic conditions and pursue business ventures.

Testing of H4 based on calculations using the Sobel test obtained a calculated t value of 6.06 which is higher than t table of 1.97. This shows that resilience significantly mediates the influence of internal locus of control on entrepreneurial intention, where the mediation that occurs is partial mediation because all relationships between variables are proven to be significant. Internal locus of control is the basis of the mindset that makes individuals resilient. When a crisis occurs in their lives, individuals will focus on internal matters rather than external factors so that individuals will recover more quickly from adversity. These important traits enhance their capacity to recognize and capitalize on entrepreneurial opportunities (Wu et al., 2023), because entrepreneurs are responsible for determining the future fate of their own companies. Business cycles also show that there will always be a phase where businesses become less strong due to changes that continue to occur in the environment. Resilience is essential for navigating new challenges, particularly for newly established ventures, which require the implementation of strategic approaches that facilitate their long-term sustainability and growth (Capera, 2024). Generation Z who are used to rising from adversity, will have a high level of interest and feel that choosing a job as an entrepreneur is easier. The findings of previous research suggest that resilience enhances entrepreneurial intention (Ukil & Jenkins, 2022).

Conclusion

All the hypotheses in this study are accepted, where internal locus of control significantly positively influences entrepreneurial intention; resilience significantly positively influences internal locus of control; resilience significantly positively influences entrepreneurial intention; and resilience significantly mediates the influence of internal locus of control to entrepreneurial intention in Generation Z in Denpasar.

These findings have important implications for aspiring entrepreneurs and educational institutions that offer entrepreneurship training, highlighting the need to foster resilience and a strong internal locus of control within the current Generation Z to enhance their entrepreneurial capabilities. Resilience and an individual's mindset during the learning process in educational settings play a critical role in determining the speed at which they can successfully start a business. Teachers and lecturers in educational institutions are responsible

for guiding students to fully develop their potential by providing challenging and self-motivating activities which are designed to help students manage their emotions and focus on overcoming challenges. By fostering these skills, students can improve their competencies and knowledge, thereby approaching entrepreneurship with greater determination, focus, and a higher potential for success. Furthermore, to reach the optimal output, government should start to arrange access of educational psychologist to give the appropriate training directly to the students or through the teaching staffs.

This study is a cross-sectional study, therefore it observes respondents at a single point in time. To address these limitations, future researchers are recommended to use longitudinal study designs that can better capture temporal relationships and provide stronger evidence for causality. Since the mediation type is partial, this suggests that there are other pathways to strengthen the influence of internal locus of control to entrepreneurial intention. It is also recommended to include additional mediating variables that may provide a deeper understanding of the relationship between the internal locus of control and entrepreneurial intention, such as motivation, self-efficacy, entrepreneurial education, or social support.

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The Ladder of Will: How Desistance Intention Shapes the Course of Crime

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Abstract

Considering inconsistent findings in existing research on crime desistence, this study aims to explore the process of individual desistance from crime. It seeks to identify key factors, their interrelationships, and their sequence of occurrence, as well as to explain the reasons for differing research outcomes. Adopting a qualitative research method, the study involved four participants, all of whom had past criminal records but had not committed any crimes in the five years prior to the interviews. Two participants were drawn from the longitudinal study by Shue et al. (1999) on early prediction of juvenile delinquency, while the other two were cohorts of the longitudinal study group. Through in-depth interviews, the following findings were made: (1) When individuals experience negative life events and associate them with their criminal behavior, these adverse outcomes are perceived as the cost of crime, leading to the development of an intention of desistence from crime. (2) The intention of desistence is a critical factor in successfully stopping criminal behavior, and individuals with varying levels of intentions exhibit different desisting processes. (3) Individuals with strong cessation intentions, often triggered by significant negative life events, display powerful agency and actively take concrete actions to sever criminal behavior. Those with weaker intentions undergo gradual changes in their circumstances, identity, and behavior through the interplay of external and internal factors, progressively reducing the frequency and severity of crimes until cessation is achieved.

Keywords: crime desistance, desistence intention, negative life events, costs of crime, agency

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Introduction

Research on crime desistance is a crucial component of criminology. According to Wolfgang et al. (1972), approximately 6% of offenders are chronic offenders who commit over half of all crimes and have longer criminal careers. However, when this research was published, most scholars focused on these persistent offenders, overlooking that the other 94% of offenders might spend more time in the desistance process after relatively shorter criminal careers. This research topic didn't begin developing until the 1990s, and there is still no comprehensive theory explaining crime desistance.

In criminology, there is no clear definition of desistance. At the same time, research on desistance faces challenges, especially in identifying suitable samples. Official records cannot confirm true desistance, and many desisters are unwilling to participate due to their desire to distance themselves from past crimes. Despite these challenges, understanding the causes and process of desistance is crucial for crime prevention. Most existing studies are cross-sectional, making it hard to determine long-term outcomes. This study uses a longitudinal approach, following participants from youth through adulthood. One group has been followed three times, showing long-term stability. Another group—peers from the same cohort—also desisted but followed different paths.

By comparing these two groups, this study highlights the diversity of desistance trajectories and helps researchers understand how key factors and transition processes differ among various desisting groups. This enables the classification and integration of existing desistance theories, thereby contributing to a more comprehensive understanding of the desistance process.

Literature Review

Major Theories of Criminal Desistance

Research on desistance from crime can generally be categorized into two main perspectives. The first emphasizes internal factors such as human agency, identity transformation, and cognitive change. The second focuses on external influences, such as informal social controls—namely the impact of marriage and employment (Kazemian, 2012). Although each approach prioritizes different key factors, neither can completely exclude the influence of the other in the desistance process.

One prominent theory is Sampson and Laub's (1993) Age-Graded Theory of Informal Social Control, which posits that prosocial states such as marriage and employment can lead individuals to desist from crime gradually and almost unconsciously. In their later revised version (Sampson & Laub, 2003), they also incorporated the concept of "human agency" as an influential factor in the desistance process. However, their overall theory still maintains that external factors are the primary drivers in prompting individuals to desist from crime.

Another influential study comes from Giordano et al. (2002), who developed the Cognitive Transformation Theory based on Symbolic Interactionism. They argue that desistance is a process wherein individuals must first adopt an openness to change. Next, they must be exposed to various "hooks for change." Through experiencing conventional roles and interacting with others, individuals undergo identity and cognitive transformations that gradually lead to desistance. In their study, individual agency plays a role early in the process,

and they assert that cognitive transformation is triggered by "agentic moves." Nevertheless, the core of their argument still emphasizes the role of social interaction in enabling identity and cognitive change that supports desistance.

Paternoster and Bushway (2009), based on rational choice theory, argue that individuals come to a point of desistance after multiple failures and accumulating dissatisfaction with life. They begin to construct a "feared self"—a vision of themselves they dread becoming, such as spending life in prison or losing loved ones. Recognizing this, the individual decides to change their identity and relies on human agency to become the person they aspire to be. This perspective is supported by a longitudinal study conducted by Liu and Bachman (2021), which spanned 20 years. Using survival analysis, they found that individuals with two to six prior offenses who developed a feared self were more likely to exert effort to distance themselves from crime.

Factors Influencing Criminal Desistance

Human Agency

Human Agency is often mentioned in desistance research, but its definition remains unclear. Sampson and Laub (2003) describe it simply as "purposeful action," while Giordano and colleagues offer no clear definition. In contrast, Paternoster and Bushway (2009) define human agency with four properties: intention, forethought, reflexivity, and power. While their model adds clarity, combining these properties into one factor may cause confusion. For example, if a person has intention and foresight but lacks reflexivity or power, do they truly have human agency—and is it enough to support desistance?

Accordingly, this study focuses on "intention," a key part of human agency, defined here as a person's active and conscious desire to stop offending. Though often described in different terms—such as motivation, decision, or proactive behavior—these ideas reflect the same core meaning. However, many studies still treat intention as a yes-or-no trait, which oversimplifies reality. Johnston et al. (2019) and Maruna (2001) are few researchers who consider it as a property that can vary in degree.

Identity

Identity is often linked to desistance. While Paternoster and Bushway (2009) argue that individuals seek a new, ideal self after painful failure, this new identity reshapes their behavior and social ties. Giordano, Cernkovich, and Rudolph (2002) view identity change as a result of positive life events and new social roles. On the other hand, Maruna (2001) believes offenders already see themselves as good, using rationalizations to protect a prosocial self-image.

Cognitive Transformation

Cognitive transformation—specifically how individuals view crime—is a key to desistance. Paternoster and Bushway (2009) argue this change occurs early, as individuals realize the harms of crime and choose to change. Giordano, Cernkovich, and Rudolph (2002) believe cognitive shifts happen later, after engaging in new relationships and roles. Sampson and Laub (1993, 2003) suggest cognitive change, if it occurs, likely happens gradually and later in the process.

Informal Social Control

Sampson and Laub see informal social control (e.g., work, partners) as a core factor throughout the desistance process. Giordano, Schroeder, et al. (2007) highlight the influence of supportive partners in identity, cognitive, and emotional change—most effective in the mid-stage. Paternoster and Bushway (2015) argue self-driven change is the most crucial factor, and informal controls are helpful but not essential.

Research also shows employment or marriage alone doesn't guarantee desistance (Black, 1976). Bushway and Reuter (1997) found jobs don't reduce crime if the person lacks desistance intention. Skardhamar and Savolainen (2012) found employment often follows desistance, not causes it. The impact of work depends on job type, involvement, and meaning to the individual (Weaver, 2015). Giordano Cernkovich, and Holland (2003) also noted that without personal commitment, partner control has little effect. Thus, structural factors like jobs and relationships are potential turning points—but their effects vary by the individual's identity and readiness (Liu & Bachman, 2021).

Methodology

A qualitative research method is adopted. Through detailed and comprehensive narratives provided by the research participants, the study seeks to capture the overall trajectory and nature of the desistance process. This study builds upon the 1999 research conducted by Hsu Chun-Chin and colleagues, which focused on juvenile offenders. A follow-up study was conducted in 2010 with the original participants. The present study targets those juvenile offenders from the 1999 study who had not engaged in any criminal behavior in the five years prior to the interviews. Among this group, a total of 10 individuals met the criteria; however, after being contacted by the researchers via mail and telephone, only two agreed to participate in this study. To increase the number and diversity of participants, two additional interviewees with similar age and background were recruited through purposive sampling. Thus, this study includes a total of four participants—two from the original 1999 study by Hsu et al., and two from the same cohort as the original participants.

Concerning data analysis, this study used a category-content approach from narrative research, interview transcripts were coded and revised. Based on four major factors—human agency, identity, cognitive transformation, and informal social control—the data were re-analyzed to identify core themes. The researcher repeatedly reviewed transcripts to refine categories and capture overlooked or emerging insights. Peer review was also conducted, with feedback used to refine themes. Findings are supported by direct quotes from participants to enhance credibility.

Findings

The life stories of four participants:

DA: Returning to the Right Path After a Brush With Death

DA began engaging in deviant behavior in junior high school. To avoid being bullied, he chose to become a "bad student" and started associating with delinquent peers. Before the age of 18, DA had been arrested by the police four times. The first three arrests were due to

stealing motorcycle parts, driven by curiosity or the desire to modify his own or his friends' motorcycles.

At the time, DA didn't take these actions seriously. Even after being arrested, he remained indifferent due to being released on bail without serious consequences. That changed one day when a friend suggested stealing from a betel nut stall. They were caught in the act, and this time, the judge refused to give DA another chance—he was sent to a juvenile detention center. This experience marked a turning point, prompting DA to reflect on his life and ask himself, "How did I end up like this?" He began to feel shame about his incarceration. After being released, DA resolved to turn his life around and cut ties with his negative peer group.

Since then, DA has not been arrested for any criminal activity. However, the true turning point came when he was 19. While out driving with a friend at night, they saw a police checkpoint. As a prank, the friend performed a drift maneuver in front of the police but accidentally crashed into a parked truck. Panicked, the friend fled the scene. Mistaking them for serious offenders, the police opened fire during the chase. DA was struck multiple times. Though he survived, he had to undergo surgery to remove his spleen and part of his liver. Lying in the emergency room, DA saw the worry and heartbreak on his family's faces. It was in that moment that he truly realized the recklessness and unfilial nature of his past.

After this incident, DA began to live a stable and lawful life. He started to work as an apprentice in a motorcycle shop. Meanwhile, he met a woman and they eventually married. DA started his own motorcycle repair business, a job he has held ever since. His business has become well-established; he often collaborates with the police to repair their motorcycles. Today, he owns three properties, lives with his parents, enjoys a harmonious marriage, and has two children. Concerned about his son potentially going down the wrong path, he even enrolled him in a private boarding school for stricter supervision, showing great dedication to his children's upbringing.

Looking back on his youth, DA admits that he was impulsive and thoughtless. He attributes much of his criminal behavior to the influence of delinquent peers. The Brush with death made him realized the cost of crime and delinquency, and further helped him generate great desistence intention which later leads him to a normal and decent life with happy family and stable work.

DB: Drifting Between Lawfulness and Delinquency

DB's parents divorced when he was little, and his father was authoritarian and often resorted to corporal punishment for discipline. In junior high school, DB lacked interest in academics and developed a strong passion for billiards. After class each day, he would head to the pool hall, where he met many deviant peers and began smoking and driving without a license.

At the age of 13, in order to join his friends on a motorcycle outing, DB stole a motorcycle and was arrested by the police. As it was his first offense, he was not sent to a correctional institution but was instead placed under protective supervision. The experience served as a warning, but it was not enough to completely steer him away from crime.

During summer vacation in junior high, DB began working part-time at a classmate's father's acrylic factory. After graduating, he initially intended to enroll in a vocational high school's auto repair program, but after failing the entrance exam, he decided to enter the workforce

instead. Working later became a turning point for him. With the money he made by his own hands, he bought himself a motorcycle, which let him realize that working is a better way to get what he wants. Since then, work has become his important social control. However, when the factory was shut down, DB was forced to change jobs. Given his love for billiards, he chose to work at a pool hall—a job he held for over a decade. At one point, DB even considered becoming a professional pool player, but he never quite broke through in the professional scene.

Even after entering the workforce, DB continued to commit a few criminal behaviors, like gambling at a night market, assaults following a drunken argument at a karaoke bar, using ecstasy at dance clubs. Luckily, those offences were not formally recorded. Additionally, due to his commitment to work, those incidents were all one-off-event.

At age 28, he met a woman who later became his wife. Getting married was the second turning point for him. DB left the pool hall to become a ventilation system technician for a more stable lifestyle. He and his wife had two daughters. Although their relationship was mostly without conflict, his work required frequent travel, which strained the marriage. At age 39, his wife filed for divorce. Afterward, DB moved in with his father and two daughters. DB devotes himself fully to his children, taking them on outings during weekends and seldom playing billiards anymore. He stated that he would not raise his daughters the way his father raised him, and instead aims to foster open communication with them.

DB's youthful deviance gradually faded as he entered the workforce and marriage. Looking back, he views his teenage theft of a motorcycle as a result of ignorance and lack of legal awareness. That experience helped DB generate a moderate level of desistance intention. While he never committed theft again, his recreational lifestyle still led to gambling, assault, and drug-using. Nevertheless, the continuing interaction with the important others through work and marriage, DB accumulates more and more informal social control in his life. Now, as a single father, DB has shifted his entire focus to his children. His daily life revolves around work and family, and he rarely visits pool halls. Overall, DB has become a relatively stable member of society.

DC: Reborn for Her Daughter

DC's deviant behavior began in junior high school. By the second semester of her first year in junior high, she had almost completely dropped out of school. Around the same time, her older brother left for college in northern Taiwan, and the absence of his companionship pushed DC toward a different path as she began spending time with neighborhood peers her age.

One of those neighbors used drugs and took DC to meet a drug dealer in exchange for free drugs. Naive and unaware, DC used methamphetamine for the first time under pressure, which marked the beginning of her drug use. Her circle of friends quickly became entirely composed of fellow drug users, one of whom eventually became her husband. They met through drug use and legally married when DC became pregnant at the age of 17.

After her daughter was born, DC stopped using drugs. However, her husband became abusive, and just three months into the marriage, she returned to her parents' home with her daughter and later filed for divorce. For the sake of her daughter, DC returned to a normal life, quit drugs, and completed her junior high education. However, after being scammed out of

NT$600,000, she had a serious conflict with her family, which led her to leave home in anger and fall back into drug use. In exchange for free drugs, she agreed to transport them, not fully understanding the severity of the consequences. She was later convicted of drug trafficking and received a heavy sentence—her first incarceration in a correctional institution (she had previously been arrested twice for drug use but was not detained).

DC spent eight long years in prison, missing her daughter's growth and the chance to say goodbye to her beloved father, who passed away during her sentence. His death hit her hard, as he had always been the one who loved her most. It made her realize that family is the most important thing in life. Because of her good behavior, she was granted parole. Before her release, she made a firm decision never to reoffend and began thinking about how to regain her family's trust—especially from her daughter, who had never visited her in prison and even refused to read her letters.

Motivated by this resolve, DC found a job just three days after her release and has held onto it ever since. She works in a food processing factory, a job that brings her a sense of purpose and happiness. She cut off all ties with her former drug-using friends and now lives a simple and disciplined life. Her transformation became evident to her family, and her daughter gradually began to accept her again. Today, DC lives with her mother and daughter. When asked to rate her satisfaction at different stages of life, DC gave her current life a 9 out of 10—saying this is the most satisfying time in her entire life.

Reflecting on the past, DC expressed deep hatred for drugs, believing they ruined her life. She deeply regrets missing the chance to say goodbye to her father during her incarceration. At the same time, she is profoundly grateful to her mother and brother, who took care of her daughter while she was in prison. These two factors helped her truly understand the cost of crime and the importance of family. These two factors helped DC generate a strong desistance intention, which further leads to an active and concrete plan for having a normal life and a powerful human agency to refuse any seduction of drugs.

DD: Entangled in Love and Resentment With Family

DD is the eldest son in a family with one sister and two younger brothers. Growing up, his father was an alcoholic who often became violent after drinking, physically abusing both his wife and children. As a result, DD remembers that the family avoided spending time in the living room whenever their father was home. DD was especially close to his mother and sister, but less so with his younger brothers due to a significant age gap.

Around the age of 21 or 22, while he was serving in the military, a traumatic incident occurred at home: his father, drunk and in conflict with his mother, stabbed DD's sister with a steak knife when she tried to intervene. She lost a kidney as a result, and their father was sentenced to prison. It was around this time that DD began using drugs. To support his drug addiction, DD started stealing and selling motorcycles. Although he was arrested for several times, his two prison sentences were short—less than six months each—and did not lead to meaningful rehabilitation. At the age of 29, DD's sister was physically abused by her boyfriend. Enraged and under the influence of drugs, DD created a homemade explosive and placed it in the boyfriend's car. The blast severely injured the boyfriend's father—resulting in the loss of his hand—and also wounded two police officers. DD was sentenced to life imprisonment for the crime.

Two years into his sentence, DD's father passed away. The fact that he couldn't say goodbye left him with a deep sense of regret. In the years that followed, his mother battled cancer, relapsed, and eventually passed away before DD could be granted parole. Her death was a devastating blow, and at that point, he even lost much of his will to live. Missing parents' funerals made DD deeply reflect on his life, and hence realized how great the cost of crime is. That recognition also came along with the strong desistance intention. He quit smoking, drugs, alcohol, and gambling entirely while in prison. After being granted parole, DD devote himself to work. By staying away from any deviant behaviors and holding a good job, he wants to let his family and late mother proud of him.

Reflecting on his past, DD expresses deep remorse. He believes his life went off track the moment he took his first hit of methamphetamine. The bombing incident, in particular, cost him many valuable years behind bars. Now, DD lives with his two brothers and has cut ties with all negative influences and habits. In his free time, he enjoys exploring good food with his girlfriend. DD describes his current life as simple yet beautiful—free and fulfilling. If he had the chance to start over, he says he would choose to live this kind of life from the very beginning.

Conclusion

Negative Life Events Foster Crime Desistance Intention and Cognitive Transformation

When individuals experience negative life events that are directly or indirectly related to their criminal behavior, these adverse outcomes may become associated with their offenses, transforming into perceived "costs of crime." The greater these costs, the more likely individuals are to develop a desire to desist from crime in order to avoid experiencing such consequences again. As Paternoster and Bushway (2009) suggest, the cost of crime can accumulate over time throughout the criminal trajectory, eventually leading to a "crystallization of discontent" that compels individuals to cease offending.

However, in some cases, a single significant negative life event can serve as a wake-up call, abruptly confronting the individual with the harsh realities and consequences of their criminal actions. This can shatter the illusion or perceived rewards associated with crime and lead to a powerful and immediate intention to desist—what may be described as determination.

Moreover, the costs of crime can reshape an individual's cognitive evaluation of criminal behavior and the lifestyle that facilitates it. Behaviors once perceived as beneficial or worthwhile may be reinterpreted as harmful or unsustainable. In essence, when negative life events become symbolically or emotionally connected to the consequences of crime, they can not only foster the desire to desist but also alter the individual's cognitive framework—no longer viewing crime as a "profitable" choice.

In summary, when adverse life events are internalized as the costs of crime, they may both ignite the motivation to desist and shift the individual's perception of crime and deviance. The greater the perceived cost, the stronger the desistance intention tends to be. Meanwhile, the intention comes along with a clearer recognition of the harm brought by criminal actions.

Desistance Intention as a Key Factor

The intention to desist is a key factor in ending criminal behavior—it acts as the starting point of the desistance process. Without it, crime rarely disappears from an individual's life. While many offenders have thoughts of stopping, the strength of that intention varies, and this difference is crucial to whether they succeed.

When the intention is strong, individuals take proactive and concrete steps toward desistance, increasing their chances of success. In contrast, when intention is weak, motivation is low, strategies are vague, and reliance on external influences grows—making the process less stable and success less likely. If there is no intention at all, desistance depends entirely on external factors, and internal tendencies may even resist positive changes, making desistance highly uncertain and unlikely.

Varying Levels of Desistance Intention Shape Different Desistance Pathways

The development of desistance intention initiates the process of ending criminal behavior. Different levels of intention lead individuals to adopt different paths toward desistance, resulting in diverse desistance trajectories. Key factors such as cognitive shifts, identity change, and informal social control are also influenced by the strength of intention, playing different roles at different stages to help stabilize the desistance process.

Desistance Process of Those With Strong Intentions

A strong intention to desist drives individuals to distance themselves from crime-related people, situations, and environments, and to actively engage in prosocial lifestyles. They overcome obstacles with determination to achieve their goal. This type of desister shows strong willpower, and due to a cognitive shift about crime, often stops offending abruptly—what can be seen as a "cliff-like" desistance. Although they later enter new environments, gain new identities, and build more prosocial beliefs and sources of control, these changes occur after desistance and are not the cause of it.

Desistance Process of Those With Moderate Intentions

Individuals with a moderate level of desistance intention are more influenced by external factors. They do not actively seek crime but also do not avoid risky situations. As Giordano, Cernkovich, and Rudolph (2002) note, they often begin with an open attitude toward life and gradually enter prosocial environments, where they experience positive life events that offer new identities and sources of control. Over time, they stop offending "by default." Their desistance is shaped by external contexts and gradual changes in self-identity and cognition, which in turn influence their choices and behavior. Because many factors are involved, this process often follows a zigzag pattern—crime does not stop immediately but decreases over time until it eventually ends.

Desistance Process of Those With Low Intentions

Individuals with low desistance intention are less likely to stop offending. They tend to maintain their original lifestyles and may even actively seek out crime or risky environments. Although they might encounter positive life events—such as marriage or employment—the lack of intention makes it difficult for them to invest in new roles or sustain a prosocial

lifestyle. As a result, these turning points often fail to lead to true desistance. Even so, desistance may eventually occur, often aligning with Gottfredson and Hirschi's (1990) view that aging reduces criminal opportunities. However, this path is typically slow and unpredictable.

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Spatial Heterogeneity and Village Reclassification for Low-Carbon Transition: A Multi-scale Typology Framework in China

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Abstract

To address China's dual-carbon goals in rural cold zones, this study proposes a multi-scale classification framework for village redevelopment, with empirical focus on the North China Plain. Provincial housing datasets subjected to machine learning clustering reveal three distinct village prototypes differentiated by infrastructural capacity, policy alignment, and technological adoption levels. Geospatial analysis reveals concentrated technology-adoption hotspots in prosperous eastern zones, exhibiting distinct developmental hierarchies, while infrastructure-deficient villages aggregate in northern ecologically fragile zones with elevated seismic risks and incomplete retrofitting. Transitional zone settlements demonstrating policy alignment show regulatory adherence deficiencies that contradict their partial modernization achievements, revealing institutional inertia in adapting national standards to local contexts. Empirical linkages connect deficient regulation implementation, outdated construction materials, and residential emission profiles through causal analysis, advocating for circular economy integration in advanced zones and blockchain-enabled quality tracking in lagging regions. Spatially differentiated governance strategies target northern bioclimatic upgrades and eastern intelligent energy networks for emission reduction prioritization—this framework bridges rural revitalization with climate resilience. The findings challenge deterministic development models, emphasizing adaptive policy calibration to reconcile ecological thresholds with equitable progress in emerging economies.

Keywords: rural housing construction, village classification, machine learning

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Introduction

The decarbonization of rural built environments has emerged as a critical frontier in global climate governance, particularly for emerging economies navigating the dual imperatives of equitable development and planetary boundary compliance. China's pursuit of carbon peaking and neutrality—a policy agenda codified in its Nationally Determined Contributions—has exposed systemic tensions between rural modernization pathways and their unintended climatic externalities. China's rural housing stock contributes substantially to national carbon inventories, with legacy fossil-dependent thermal regulation systems and climate-mismatched vernacular architectures amplifying emission intensities. In cold zones, where suboptimal thermal performance amplifies household energy demands, rural per capita emissions exceed urban equivalents by a factor of 2.3, underscoring the urgency to reconceptualize housing systems as dynamic socio-technical networks rather than static physical assets.

Prevailing analytical frameworks inadequately address the co-evolution of rural housing materiality with place-specific developmental trajectories. Remote sensing-derived typologies, while effective in cataloging spatial distributions of building materials, often neglect the institutional path dependencies engendered by historical policy interventions. Provincial datasets reveal a paradoxical divergence between regulatory achievements and emission trajectories: Regions achieving high earthquake regulation adherence ($\geq 80\%$) show limited penetration of energy-saving renovations ($< 30\%$) in comparative analysis, reflecting misaligned incentives between safety mandates and climate objectives. Such disconnects underscore the need for multi-scalar methodologies that reconcile material stock dynamics with governance hybridity and lifecycle carbon accounting.

This investigation focuses on China's cold climatic zones, where frost-related structural vulnerabilities intersect with elevated heating demands to intensify the carbon-intensity of rural habitats. Grounded in a unique dataset across 126 counties, the study advances a machine learning-driven typology framework that transcends conventional weighted-index models. By applying k-shape clustering to 11 indicators spanning material resilience, energy transition, and regulatory efficacy, the analysis captures nonlinear interactions between policy-sensitive variables and contextual constraints. Analytical frameworks expose how infrastructure renewal successes can coincide with renewable technology stagnation when budgetary allocations compete—a pattern obscured by normative assessment paradigms.

Theoretical contributions emerge in redefining emission mitigation as a process of institutional-material co-evolution, where adaptive governance must reconcile technical standards with socioecological realities. Research outcomes contest linear development paradigms by revealing path-dependent constraints from past policy interventions. Practically, the framework equips policymakers with diagnostic tools to align spatial governance with typology-specific decarbonization leverage points, prioritizing bioclimatic retrofitting in ecologically fragile zones and smart grid deployment in industrializing corridors.

Materials and Methodology

Data Sources and Indicator System

The empirical foundation of this research stems from a multi-year, nationally coordinated survey initiative designed to capture the evolving dynamics of rural housing systems across China's heterogeneous climatic and socioeconomic landscapes. Sampling methodology covered 126 counties, ensuring proportional representation of geographic diversity, developmental gradients, and policy implementation contexts. This methodological architecture systematically integrates institutional statistical records, household-level perceptual surveys, and geospatial audits to triangulate multidimensional assessments of housing safety protocols, regulatory adherence, and modernization trajectories.

An analytical framework comprising 11 validated indicators was developed through iterative consultation with provincial construction authorities and interdisciplinary expert panels. Building structural integrity was quantified using earthquake regulation adherence rates, dangerous residence renovation metrics, and poverty-alleviation housing upgrade statistics. Regulatory robustness assessments quantified standardized design adoption frequencies, construction approval adherence rates, and artisan certification ratios, exposing systemic discrepancies between procedural formality and substantive quality oversight. Development progression was assessed through sanitation access rates and energy-saving renovation completion metrics, and clean energy utilization percentages, with spatial variance attributed to climatic exigencies and localized cultural practices.

Methodological integration of machine learning-driven clustering techniques enabled granular dissection of latent development patterns obscured by conventional weighted-index models. This approach transcended heuristic categorization by exposing nonlinear interactions between policy-sensitive variables and contextual constraints, particularly the inverse relationship between seismic code enforcement rigor and renewable energy adoption rates in transitional economic corridors. The resultant framework establishes a diagnostic-prognostic tool for spatially adaptive policy formulation, aligning technical interventions with regionally embedded carbon mitigation potentials.

Methodology and K-shape Clustering

This investigation advances analytical rigor through time-series clustering, systematically decoding spatiotemporal variances in rural housing evolution. Unlike conventional clustering paradigms that prioritize static feature similarity, the k-shape algorithm was specifically leveraged for its capacity to dissect multidimensional developmental trajectories through dynamic time warping (DTW)-optimized centroid computation. This approach proved indispensable given the non-stationary nature of rural housing transitions, where asynchronous policy implementation cycles and regionally divergent modernization velocities generate nonlinear interactions between structural resilience, regulatory compliance, and energy transition indicators. Algorithm validation using silhouette analysis (maximum score 0.3429) demonstrated effective cluster differentiation through statistical verification, a critical advantage when confronting high-dimensional datasets characterized by collinear policy-sensitive variables.

The k-shape paradigm's unique suitability for this investigation stemmed from three synergistic attributes: First, its DTW-optimized distance metric accommodated asynchronous

progressions in housing modernization metrics—such as delayed seismic retrofitting relative to clean energy adoption—that conventional Euclidean measures would misinterpret as categorical dissimilarities. Second, the algorithm's invariance to variable scaling proved vital in harmonizing disparate measurement units across construction quality indicators, from percentage-based compliance rates to ordinal material resilience rankings. Third, its capacity to identify phase-shifted similarities enabled detection of regionally divergent yet structurally analogous development trajectories, such as northwestern counties achieving equivalent modernization outcomes through alternative sequences of policy interventions. By transcending the limitations of conventional cross-sectional clustering, this approach advanced rural housing analysis from static typology generation to dynamic pathway characterization—a paradigm shift essential for aligning decarbonization strategies with place-specific institutional and material evolution rhythms.

Results and Discussion

Current Status of Rural Housing Construction in National Sample Counties

The empirical assessment of rural housing systems across sampled counties unveiled profound asymmetries in structural integrity, institutional compliance, and technological modernization trajectories. Structural vulnerability manifested most critically in seismic resilience metrics, where adherence to earthquake-resistant design specifications remained critically deficient, with a national median compliance rate barely surpassing single-digit thresholds. This systemic precarity contrasted sharply with near-universal completion rates of poverty-alleviation housing initiatives, wherein over 95% of designated low-income households received retrofitting interventions—a testament to targeted fiscal prioritization. Policy-driven safety enhancements exhibited moderate success, with two-thirds of identified structurally compromised dwellings undergoing remediation, though pronounced interprovincial disparities persisted in material upgrading protocols. The adoption of contemporary construction methodologies revealed incremental progress, as evidenced by cast-in-place concrete utilization rates approximating three-fifths of new builds, yet persistent reliance on non-standardized techniques underscored unresolved tensions between vernacular practices and modern engineering paradigms.

Regulatory performance metrics exposed paradoxical governance dynamics, juxtaposing robust procedural adherence to land-use approvals and completion certifications against fragmented implementation of technical standardization mandates. While administrative compliance rates for statutory construction processes exceeded four-fifths nationally, professionalization of rural construction workforces lagged precipitously—certified artisan participation rates stagnated below one-third in economically transitional regions. This institutional dissonance between bureaucratic formality and operational rigor precipitated cyclical quality assurance failures, particularly evident in material procurement irregularities and thermal envelope performance deficits.

Geospatial analysis revealed hierarchical modernization gradients, wherein basic sanitation coverage achieved 73% penetration yet displayed 22% interregional disparity between coastal and inland zones. Energy transition metrics revealed coevolving contradictions: clean energy adoption plateaued at median rates of 50%, while solar water heater diffusion demonstrated extreme variance (40–80%) contingent upon localized microclimates and generational housing preferences. Insulation retrofitting initiatives achieved moderate success, with penetration rates nearing 60% in economically vibrant eastern corridors, yet

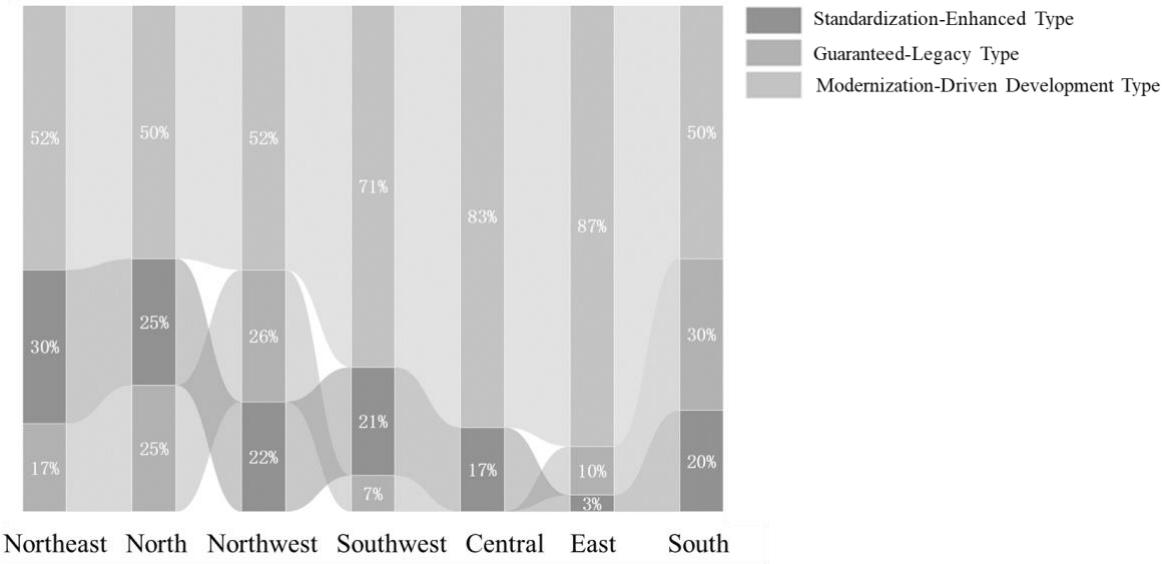
persistent reliance on coal-fired heating systems in northern cold zones negated potential emission reductions. These findings collectively delineate a transitional landscape where rapid infrastructural expansion coexists with entrenched technical-institutional bottlenecks. Multiscalar governance protocols must calibrate infrastructure investments to localized socio-metabolic thresholds.

Typological Differentiation of Rural Housing Development

The application of machine learning-driven clustering to multidimensional housing indicators yielded three distinct archetypes, each representing unique intersections of structural resilience, institutional compliance, and technological modernization. The first cluster, characterized by infrastructural deficiencies, exhibited critical vulnerabilities in seismic retrofitting progress and energy performance metrics. Analysis revealed that less than one-tenth of dwellings in these regions adhered to earthquake-resistant design specifications, with incomplete implementation of poverty-alleviation housing initiatives further exacerbating material obsolescence. Geographically concentrated in ecologically fragile northern territories, these settlements demonstrated a persistent reliance on coal-dependent heating systems, contributing to per capita carbon footprints 1.8 times higher than national averages.

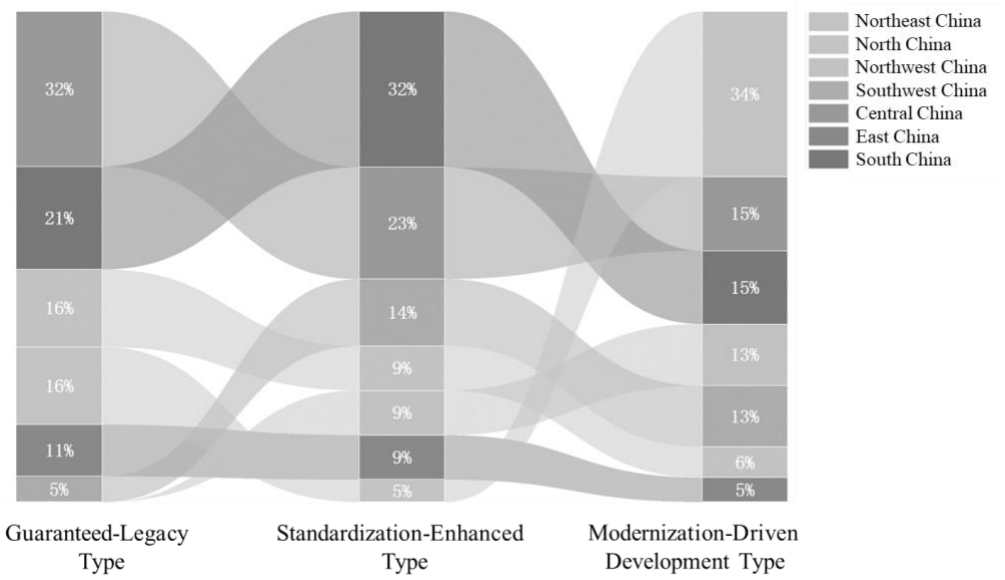
Figure 1

This is the Distribution of Various Types Classified by Region



A second typology emerged in transitional economic corridors, where procedural adherence to statutory approvals masked systemic gaps in construction standardization. While achieving four-fifths compliance with land-use permitting protocols, these regions struggled with inconsistent adoption of energy-efficient retrofitting techniques, resulting in a 35% disparity in insulation penetration rates compared to advanced clusters. The coexistence of moderate clean energy adoption and fossil fuel dependency highlighted institutional inertia in aligning regulatory frameworks with decarbonization imperatives. Workforce professionalization emerged as a critical constraint, with certified artisan participation rates stagnating below one-third despite moderate progress in sanitation infrastructure modernization.

Figure 2
This is the Distribution of Rural Settlements in Various Regions Classified by Clustering Types



The dominant cluster, representing nearly three-quarters of sampled counties, exemplified synergistic advancements in housing safety and functional performance. Coastal regions within this typology demonstrated near-universal compliance with seismic codes alongside high penetration rates of renewable energy systems, achieving a 60% reduction in operational emissions relative to lagging counterparts. However, latent risks of technological lock-in persisted in early-adopting areas, where standardized yet thermally inefficient designs constrained further decarbonization. Northern subregions within this cluster faced unresolved challenges in phasing out coal-fired heating, underscoring the incomplete nature of energy transitions even in modernization-advanced contexts.

Inter-cluster comparisons revealed nonlinear relationships between governance efficacy and emission trajectories. Regions with robust regulatory frameworks exhibited 40% faster adoption of bioclimatic design principles, yet paradoxically demonstrated higher embodied carbon intensities due to material-intensive retrofitting practices. Transitional clusters displayed disproportional responsiveness to quality assurance interventions, where a 10% increase in artisan certification rates correlated with a 22% decline in construction-related emissions. These differential pathways necessitate context-sensitive policy instruments that reconcile immediate safety imperatives with long-term decarbonization goals, avoiding one-size-fits-all approaches that risk amplifying regional disparities.

The typological framework challenges deterministic models of rural development by demonstrating how historical policy legacies and localized governance capacities co-evolve with material conditions. Areas needing conservation demand combined solutions tackling building safety risks and energy accessibility challenges, while transitional corridors demand digitized compliance mechanisms to bridge procedural-formal divides. For modernization-advanced zones, circular economy principles must counterbalance the embodied carbon costs of prior infrastructure investments. By redefining housing systems as dynamic socio-technical networks rather than static physical assets, this stratification enables targeted resource allocation aligned with place-specific decarbonization leverage points.

Conclusions

The hierarchical classification framework developed in this investigation necessitates a paradigm shift in decarbonizing rural habitats, emphasizing the codependent evolution of vernacular material systems, institutional path dependencies, and spatially stratified emission trajectories. Conservation-priority zones, predominantly distributed across northern ecologically vulnerable territories, exemplify the compounding risks of fragmented retrofitting regimes where deferred structural upgrades perpetuate carbon-intensive adaptive behaviors while amplifying climate vulnerability. These regions demand integrative intervention protocols that synchronize bioclimatic retrofitting with distributed renewable microgrid deployment, leveraging fiscal instruments such as tiered subsidy mechanisms to overcome capital accessibility barriers while preserving vernacular architectural integrity. Transitional governance systems occupying economic corridors require institutional innovations transcending procedural compliance, necessitating blockchain-enabled quality tracing architectures to bridge persistent gaps between regulatory formalism and material performance benchmarks. Modernization-leading clusters confront the paradox of technological lock-in from early infrastructure investments, mandating phased transition roadmaps that integrate passive design retrofits with smart grid interoperability while operationalizing circular material flows to mitigate embodied carbon legacies.

This analytical framework challenges deterministic development models by demonstrating nonlinear emission reduction potentials across spatial hierarchies. Ecologically fragile zones exhibit disproportional decarbonization responsiveness to bioclimatic design interventions, whereas economically advanced regions achieve optimal mitigation through industrial symbiosis networks that repurpose agricultural byproducts into low-carbon construction biomaterials. The findings advocate for polycentric governance architectures that devolve technical standard adaptations to provincial authorities while maintaining national compliance baselines, thereby reconciling ecological imperatives with localized socio-cultural realities. Such paradigmatic shifts position rural housing systems as active socio-ecological negotiation processes rather than passive emission sources, transforming vernacular structures into dynamic sites of climate-responsive innovation.

Conceptual progress originates from redesigned emission accounting frameworks integrating institutional inertia dynamics—dimensions historically marginalized in conventional lifecycle assessment models. Practically, the diagnostic-prognostic framework empowers municipalities to prioritize context-specific interventions aligned with typological readiness levels, optimizing resource allocation across China's heterogeneous rural landscapes. Future investigations must address temporal dynamics of typological evolution, particularly rebound risks associated with energy-efficient modernization in advanced clusters and hysteresis effects retrofitting in conservation-priority systems. By synthesizing material institutional economics, this approach establishes a transferable paradigm for emerging economies navigating the dual imperatives of equitable progress and planetary boundary compliance, ultimately redefining rural habitats as living laboratories for transition.

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Technology Advancement for Sustainable Urban Farming to Improve Social Welfare by Empowering Local Community: A Case of Pindad Industry-Manufacturing, Indonesia

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Abstract

This paper discusses about the development of Urban Farming (UF) as an initiative to improve the welfare of local community by leveraging technology advancement as a core competency from Pindad Industry Manufacturing. The UF here has been developed for half a decade by following CSV concept, aligned with the history of the unmanaged landfills in the previous publication that transform to be gardening facilities by empowering 33 locals, especially the most vulnerable in the area, which is women and elders. This introduced the development of the UF with technological approach, such as rain water harvesting, small-scale solar power and wind power, and composting with utilization of organic waste. The results shows that the initiative has impact on water efficiency about 9,000 m3/year; energy efficiency about 2.52 Giga-Joules/year from renewable energy usage. The industry also supports locals by managing organic waste into compost processing, produces 309 tons of organic-fertilizer. At least 20 productive-plants were successfully harvested, 30% were farmers-consumed; the other 70% were marketed locally, supporting the local needs of plant-based food sources thus supporting community social welfare. To enhance the key performance measurement, the index of social return on investment has been calculated with the result of 3.87 along with the community satisfaction of 88.03%. This means the program has able to present social benefit for the locals. The program also emphasised lesson learned regarding to farm to table concept, simultaneously reducing the impact of odour from the garbage unmanaged disposal, with the touch of collaboration with local community involvement.

Keywords: Sustainable Development Goals (SDGs), technology advancement, Pindad industry manufacturing, urban farming

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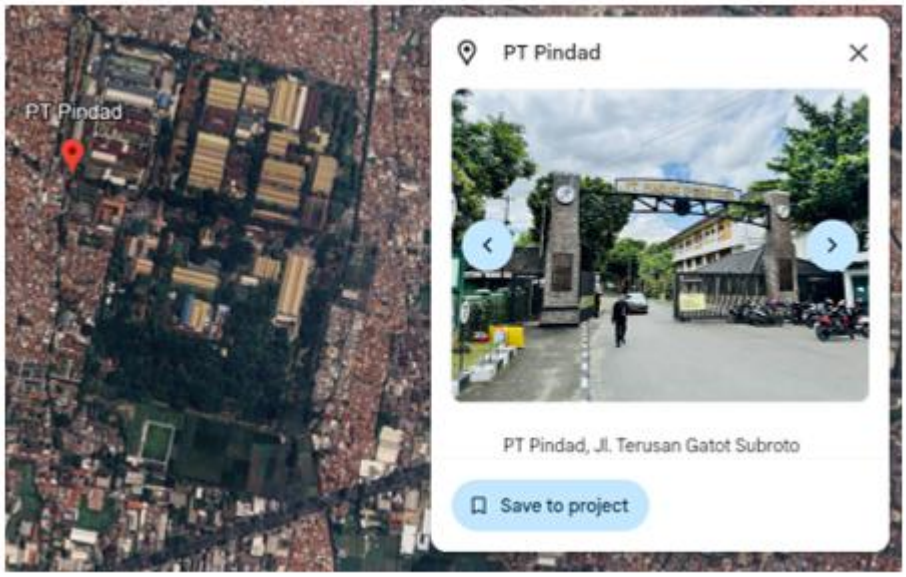
Introduction

PT Pindad is a company engaged in the field of Manufacturing/Metal Processing for Defense Equipment and Industrial which was established on April 29, 1983 with a land area of 66 Ha in Bandung area. Figure 1 illustrates the location of Pindad's

Figure 1
Location of Pindad's Operational Area in Bandung



Source. Pindad (2025)

Urban farming has emerged as a transformative solution to address food insecurity (Unay-Gailhard et al., 2025), urban waste management, and social inequality (Toku, et al., 2024), especially in rapidly urbanizing regions (Braamhaar et al., 2025; Doron, 2005; Garnett, 2012). Pindad initiated a community-focused urban farming program (Bailkey & Nasr, 2000; Barthel & Isendahl, 2013; FAO, 2011; Lohrberg et al., 2016) in response to increasing environmental challenges (Mougeot, 2005) and the need to repurpose unmanaged waste sites (Permatasari et al., 2022; UN-Habitat, 2020).

The initiative represents a unique convergence of environmental engineering and social empowerment, leveraging Pindad's manufacturing capabilities to implement solar and wind-based irrigation systems, organic composting, and low-tech greenhouse solutions. Target beneficiaries included 33 local community members, with a focus on vulnerable groups such as women and elderly residents. This paper documents the program's development, technological features, impact on social and environmental indicators, and strategic alignment with Sustainable Development Goals (SDGs).

Background and Context

The 37-hectare Pindad City Forest Park was previously characterized by unmanaged dry leaf waste and landfills (see Figure 2). The transformation began in 2019 with the establishment of the Urban Farming zone, aiming to:

- Provide green, inclusive space in urban settings.
- Encourage sustainable food production.
- Foster income-generating activities for local communities.

Figure 2

(a) Initial Condition of Unmanaged Land; (b) Initiative to Transform the Unmanaged Land Into Urban Farming; and (c) The Urban Farming Implementation

Source. Somantri et al. (2024)

The initiative was framed within the Creating Shared Value (CSV) concept (D'Souza et al., 2024; Somwethee et al., 2025), positioning corporate resources for mutual environmental and social benefits (Azam et al., 2025). It also aligns with multiple SDGs, including SDG 2 (Zero Hunger), SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities), and SDG 12 (Responsible Consumption and Production) (UN SDGs, 2016).

Methodology

A combination of qualitative and quantitative methods was used to evaluate the outcomes of the initiative. The project deployed technological tools and training for participants and tracked environmental and social metrics. Key components included:

- **Technology Deployment**: Installation of a hybrid renewable energy system (solar panels and wind turbines), smart sprinklers, composters, and organic fertilizer production units. (see Figure 3)

Figure 3

Pindad's Innovations for Sustainability

Source. Ruslana et al. (2024)

- **Community Training**: Skill-building sessions for compost processing, greenhouse planting, and waste sorting. (see Figure 4)

Figure 4
Community Training for Urban Farming Activities

Source. Sumeitri et al. (2024)

- **Monitoring & Evaluation**: Monitoring and Evaluation were conducted using SROI analysis, satisfaction surveys, energy/water usage logs, and waste tracking reports. The program has driven the utilization of the unmanaged land and creating positive social and environmental impact. (see Figure 5)

Figure 5
Monitoring and Evaluation for Urban Farming Activities

Source. Somantri et al. (2025)

This initiative has creating social open spaces for children in the midst of urban density, thus in the same time creating nature-based knowledge.

Data were collected over five years from 2019 to 2024 through direct observation, focus group discussions, and internal sustainability audits.

Results and Discussion

Environmental Outcomes

- **Water Efficiency**: Rainwater harvesting reduced dependency on municipal sources, saving 9,000 m³ of water annually.
- **Energy Use**: Renewable energy technologies supplied 2.52 GJ/year of clean energy, reducing carbon footprint.

- **Emission Reduction**: Estimated 35 tons of CO_2-eq avoided annually.
- **Waste Management**: 1.2 tons of solid and 0.55 tons of hazardous waste were sorted and diverted from landfill.
- **Compost Production**: 309 tons of organic fertilizer were produced using processed organic waste.

Social and Economic Impact

- **Employment and Income**: Empowered 33 community members through steady roles in farming, composting, and selling harvests.
- **Food Security**: 20 types of productive plants grown; 30% used for family consumption, 70% marketed locally.
- **SROI**: The program achieved a Social Return on Investment of 3.87.
- **Community Engagement**: 88.03% satisfaction rate reported in 2024 surveys, with improved health, nutrition, and community pride.

Technology as an Enabler

As shown in Figure 3-4 above, the integration of low-cost, durable technology enabled resilience in urban farming. Solar and wind power minimized operational costs and supported off-grid communities. The use of composting equipment reduced odor and pest issues, addressing local resistance to waste management. Back to the initial activities, technology is the core of the initiative, starting from the use of excavator as one of Pindad's industrial product., and the water sprinkler for water efficiency as depicted in Figure 6.

Figure 6
Technology Enabler for Urban Farming Activities

Source. Kristina et al. (2025)

Educational Spillover

Workshops and field visits were conducted for local schools and institutions to learn sustainable farming. These sessions have fostered a new generation of environmental stewards and catalysed replication of similar models in nearby neighbourhoods. Local government support also plays a key role in the success of this initiative, as depicted in Figure 7.

Figure 7
Transfer Knowledge and Support From Local Government

Sourc. Somantri et al. (2025)

Challenges and Lessons Learned

- **Cultural Barriers**: Initial reluctance among residents regarding waste handling was mitigated through peer-led advocacy.
- **Technical Maintenance**: Regular upkeep of renewable installations required continuous training and budget.
- **Institutional Coordination**: Multi-stakeholder collaboration was essential but time-intensive.

Conclusion

Pindad's urban farming initiative demonstrates that integrating technological innovation with community participation can lead to measurable improvements in both environmental and social domains. The program exemplifies how previously neglected urban spaces can become productive, educational, and sustainable.

Recommendations

- Expand to other underutilized industrial or urban sites.
- Establish formal sustainability metrics and integrate them into company reporting.
- Foster stronger public-private partnerships for replication.
- Promote urban farming as part of national circular economy strategies.

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The Effect of Adverse Childhood Experiences and Perceived Social Support on Career Adaptability: Narrative Review

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Abstract

Adverse childhood experiences and their negative impacts have garnered significant attention. While most studies have primarily focused on their effects on mental health, relatively little research has explored their influence on career development, as well as the underlying mechanisms and protective factors involved. To address this gap, this narrative review examines the impact of adverse childhood experiences on career adaptability and the role of perceived social support in this relationship. The findings indicate that: (1) the effects of adverse childhood experiences on career adaptability can be both negative and positive; (2) perceived social support can partially buffer the negative impact of adverse childhood experiences on career development and career adaptability. However, the protective role of perceived social support has certain limitations. This review provides theoretical insights for future research and practical recommendations for career and psychological counselling practitioners.

Keywords: adverse childhood experiences, perceived social support, career adaptability, literature review

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Background

Recently, there has been a noticeable increase in awareness of self-exploration among people, contributing to a rising trend in reading psychology books. Many psychologists, including Judith Herman, Bessel van der Kolk, and John Bowlby, have emphasized the critical role of childhood experiences in shaping an individual's future development, and the general public has come to recognize these theories. In fact, by browsing social media platforms, many youths share their experiences regarding adverse childhood experiences (ACEs) online.

ACEs are highly prevalent. Surveys in the United States reveal that 64% of U. S. adults report experiencing at least one type of ACEs (Centers for Disease Control and Prevention [CDC], 2024). While no authoritative organization in China currently provides official statistics on the prevalence of ACEs, previous studies have estimated an incidence rate ranging from 31% to 93.5% (Chen et al., 2022). Given the widespread prevalence, understanding the long-term psychological and developmental impacts has become a critical area of research. Horney (1937) emphasized that low-income family relationships are a significant cause of psychological trauma. She pointed out that childhood neglect – a form of ACEs– could lead to a fear of isolation, which, in turn, creates deep-seated anxiety affecting mental health in adulthood.

Childhood experiences play a crucial role in career development. Edward Bordin, a proponent of psychodynamic theory, emphasized that the dynamics influencing career choices stem from an adaptation system shaped by early experiences. He argued that exploring career needs should involve examining an individual's past experiences (W. X. Zhou et al., 2022). Additionally, Career Construction Theory (CCT) underscores the significance of past experiences in career development (Savickas, 2005). Specifically, these experiences influence the formation of life themes, which subsequently affect career adaptability. Career adaptability is defined as the readiness to utilize resources for current and anticipated career development tasks (W. X. Zhou et al., 2022).

ACEs can significantly impact career development; however, this effect can be alleviated if individuals have adequate social support. The Stress Buffering Model (SBM) emphasizes that social support can mitigate the negative consequences of stressful events (Cohen & Wills, 1985). Similarly, the adverse effects of ACEs can be lessened through social support. Therefore, it is essential to discuss how adverse childhood experiences influence career adaptability and the protective role of perceived social support.

Adverse Childhood Experiences

Felitti et al. (1998) introduced the term ACEs to describe a combination of violence, abuse, neglect, and family dysfunction, including witnessing violence, parental violence, and separation from parents, as well as mental health problems within the home. These experiences typically occur before the age of 18 and can have lifelong impacts, not only through intergenerational transmission but also by affecting children's social and emotional development (Samji et al., 2024; Treat et al., 2019). According to the CDC, these experiences encompass various risk factors categorized as individual, family, and community risk factors (Centers for Disease Control and Prevention, 2024). Hietamäki et al. (2023) expanded this concept by including childhood bullying and economic difficulties as additional ACEs.

While ACEs are inherently negative events, Post-Traumatic Growth Theory (PTG) suggests that individuals may derive certain benefits from traumatic experiences in three areas: changes in self-perception, changes in interpersonal relationships, and a shift in life philosophy (Tedeschi & Calhoun, 1996). Despite these potential positive effects, they can vary significantly from person to person. In many instances, the negative consequences of ACEs are not only overwhelming but also tend to have a more profound and lasting impact on individuals.

Freud (1917) proposed that negative childhood experiences are repressed in the unconscious and influence behavior in adulthood, potentially leading to issues such as anxiety, neurosis, or personality disorders. Similarly, Karen Horney argued that a lack of adequate security and love during childhood triggers fear of isolation and abandonment, which can create deep-rooted anxiety and ultimately result in various psychological problems in adulthood. She particularly emphasized unhealthy family relationships as a primary source of trauma (Horney, 1937). More importantly, children who are victims of abuse and violence often become intensely focused on the external world of trauma, neglecting to reflect on and explore their internal experiences (Wagner-Skacel et al., 2022).

Traumatic ACEs have been shown to impair executive functioning. These experiences can lead to various mental health issues, including poor sleep quality, substance use, suicidal thoughts, non-suicidal self-injurious behaviours, depression, and anxiety (Maheshwari et al., 2024; McCollum et al., 2024; Nan et al., 2023; Rogerson et al., 2024). Moreover, individuals exposed to ACEs tend to exhibit higher levels of anxiety and depression, along with a sense of powerlessness when facing stressful situations (Hughes et al., 2024; Russo et al., 2022). These negative experiences can lead to harmful coping strategies, further exacerbating the situation and increasing the prevalence of major depressive disorders (Li et al., 2024).

Additionally, ACEs significantly impact the development of interpersonal relationships. According to Social Learning Theory, individuals learn behaviours by observing others (Bandura, 1977). Consequently, those who experience physical or emotional abuse during childhood may unintentionally adopt these behaviours, potentially leading them to become perpetrators of similar abuse in adulthood. This cycle not only perpetuates harm but also contributes to their children's social and emotional difficulties (McClure & Parmenter, 2020; Merrin et al., 2024; Treat et al., 2019; Zhu et al., 2024). Moreover, systematic literature reviews have shown that individuals with ACEs exhibit lower levels of trust in interpersonal relationships and related support services. They often have fewer friends, place less importance on peer relationships, and maintain weaker social connections overall (Hughes et al., 2024; Wang et al., 2024).

Social Support and Perceived Social Support

ACEs can result in both negative and potentially positive changes in interpersonal relationships. These relationships, which are crucial for providing support, hold particular significance in certain cultural contexts. This highlights the importance of social support for individuals who have had such experiences. Social support refers to the process of making individuals feel cared for and valued by others, including family and friends (Cobb, 1976; Dewani & Nuzulia, 2024). Building on this foundation, social support was introduced as a subjective cognitive component, giving rise to the concept of perceived social support. Zimet et al. (1990) divided perceived social support into three dimensions: family support, friend support, and other support. The Buffering Hypothesis (BH) proposed by Cohen and Wills

(1985) expands on the role of social support in the SBM. According to this, perceived social support – including emotional, esteem, instrumental, and information support – acts as a buffer against various sources of stress. Similarly, Hobfoll (2001) introduced the Conservation of Resources Theory (CRT), which also views social support as a valuable and limited resource that helps individuals cope with stressful situations and mitigates their impact.

Cultural background can significantly influence how individuals perceive social support. While one might assume that individuals from collectivistic cultures have a greater need for social support, research indicates the opposite. People from collectivistic backgrounds often have a lower need for social support because they fear that seeking help could harm their existing interpersonal relationships (H. S. Kim et al., 2008; Taylor et al., 2004). For instance, a study found that Japanese participants from East Asian cultures sought social support less frequently in stressful situations compared to European Canadians (Zheng et al., 2021). Additionally, early experiences and the environment in which one is raised are significant predictors of social support levels. Childhood trauma can result in reduced perceptions of social support (Angelakis & Gooding, 2022; Caravaca-Sánchez et al., 2019; Rodriguez et al., 2019). Specifically, adverse childhood experiences are linked to lower perceived family support (Dorri et al., 2023; Wu et al., 2023).

Lower perception of social support can lead to heightened feelings of loneliness and increased rumination. This, in turn, raises the risk of various mental health issues, such as depression and anxiety (Cheong et al., 2017; Dorri et al., 2023; Li et al., 2024; Liu et al., 2022; Zheng et al., 2021). For young individuals, perceived social support significantly influences their future development, particularly in terms of expectations and career choices (Fraser et al., 2024; Ghosh & Fouad, 2017). In stressful situations, social support serves as a crucial protective resource and plays a key role in coping with adversity (Cassel, 1976; Szkody et al., 2020). According to the BH and the CRT, perceived social support can mitigate the negative effects of stress to some extent (Cohen & Wills, 1985; Hobfoll, 2001). Furthermore, it can enhance cognitive and emotional processing of experienced events, aiding individuals in reappraising stressful situations (Cheong et al., 2017).

Career Adaptability

Factors such as ACEs and a lack of social support can impact coping strategies and increase sensitivity to stress. This may result in insufficient self-regulation when faced with uncertainties in career development. Roe, Ginzberg, and Super have pointed out that career development is a lifelong process. From the moment of birth, individuals begin exploring their career paths (Dugger, 2016). Therefore, it is crucial to understand and develop the necessary competencies throughout this journey.

The definition of career adaptability was first introduced in CCT by Savickas (2005), which encompasses actions, attitudes, beliefs, and competencies, highlighting an ongoing interaction between the inner and external worlds. It was further defined as the readiness of resources for an individual's current and anticipated career development tasks (Savickas & Porfeli, 2012). It comprises four dimensions: concern, control, curiosity, and confidence. Among these dimensions, the most significant is career concern, which focuses on attention to and anticipation of future career possibilities (Savickas & Porfeli, 2012; W. X. Zhou et al., 2022).

In some cultural contexts, parents' sense of honour is heavily influenced by their children's career success. They hold high expectations for their children and hope that their career choices will enhance the family's socioeconomic status (Song et al., 2022; N. Zhou et al., 2020; W. X. Zhou et al., 2022). Consequently, many parents adopt the mindset that "one person's success elevates the entire family," which often leads them to intervene in their children's career choices and development. This intervention can create uncertainty for young people as they navigate their career paths (N. Zhou et al., 2020), potentially resulting in diminished self-regulation skills and lower levels of career adaptability (Savickas & Porfeli, 2012). Considering these factors, support resources become particularly important. Studies have confirmed that the resources and support individuals obtain through social networks play a predictive role in career adaptability (Gheyassi & Alambeigi, 2024; Karacan–ozdemır & Yerın Gunerı, 2016; Mini et al., 2024). Specifically, perceived support from parents has been shown to predict career adaptability, with core self-evaluation moderating this relationship (Mini et al., 2024).

Certain personal factors also contribute to career adaptability. Studies indicate that individuals with personality traits such as optimism, extroversion, agreeableness, and emotional stability tend to exhibit stronger career adaptability (Gustmann de Castro et al., 2024; Karacan–ozdemır & Yerın Gunerı, 2016). Moreover, psychological capital, which includes self-efficacy, hope, resilience, and optimism, also plays a significant role in predicting career adaptability (Gerçek, 2024; Gheyassi & Alambeigi, 2024; Karacan–ozdemır & Yerın Gunerı, 2016).

Effects of Adverse Childhood Experiences on Career Adaptability

CCT emphasizes the essential role of past experiences in career development. Specifically, past experiences influence the formation of life themes, which subsequently impact career adaptability (Savickas, 2005; W. X. Zhou et al., 2022). Adverse childhood experiences (ACEs) as negative past experiences predict career adaptability (J. Kim & Smith, 2021). This is further supported by Bryce et al. (2023), who found that career development could also be influenced by ACEs; the way individuals experience and interpret trauma plays a crucial role in their ability to adjust and build their careers.

According to the Centers for Disease Control and Prevention (2024), low family socioeconomic status (i.e., low income) and low parental education are risk factors for ACEs. Studies have confirmed that these risk factors affect individuals' career choices, career development, and career adaptability. Regarding socioeconomic status, even when individuals have high career aspirations, growing up in a low socioeconomic environment often results in a lack of adequate resources (Chukwu & Tor-Anyiin, 2024; Gjerustad & von Soest, 2012), hindering the development of career adaptability. Similarly, a mother's education level is positively correlated with her children's career adaptability (Song et al., 2022).

However, according to the PTG theory, traumatic events may promote individual development to some extent, enabling new possibilities to emerge (Tedeschi & Calhoun, 1996). This theory posits that traumatic events disrupt individuals' existing beliefs about the world, prompting a re-evaluation of the meaning and goals of their lives. Through cognitive reconstruction, individuals may uncover new possibilities in life and adjust their life direction. In other words, people with ACEs may become more attuned to their own needs, be more likely to explore new paths and opportunities, and thus establish relatively clear goals in their

career development. Furthermore, the theory highlights that traumatic events may enhance an individual's psychological adaptability through deep reflection and coping. Consequently, individuals with adverse childhood experiences will exhibit greater courage in facing difficulties when confronted with challenges and uncertainties in their career development, developing a high level of career adaptability.

The Buffering Role of Perceived Social Support

Even when individuals experience similar levels of ACEs, their outcomes can vary significantly. The Diathesis-Stress Model emphasizes that this difference may arise from protective factors, such as social support (Ingram & Luxton, 2005). Whether among adolescents, university students, or the general adult population, ACEs can adversely affect mental health and behavior. However, perceiving adequate social support can mitigate these negative effects (Evans et al., 2013; Li et al., 2024; McCollum et al., 2024; Wang et al., 2024; Watt et al., 2020; Wu et al., 2023; Xiang et al., 2024; G. Zhou & Li, 2024). The protective role of social support and perceived social support for these individuals can be explored from two perspectives.

From the perspective of ACEs as traumatic events, PTG suggests that the vulnerability caused by such experiences may enhance sensitivity to others, increasing the willingness to accept help (Tedeschi & Calhoun, 1996). In this way, individuals with ACEs may be more sensitive to social support, making them more likely to recognize support from others. This sensitivity helps improve their career adaptability levels (Agoes Salim et al., 2023; Chen et al., 2024; Dewani & Nuzulia, 2024; Xue, 2022; Zhao et al., 2022). Similarly, when viewing ACEs and their influence on career adaptability as a stressful event, the SBM emphasizes that social support mitigates the negative impacts of stress by reducing stress assessment responses (Cohen & Wills, 1985; Murthi & Espelage, 2005). Once enough social support is felt, individuals are less likely to choose emotionally focused coping strategies when facing difficulties (Smaoui et al., 2024).

Building on this, theories and previous research have confirmed that perceived social support can impact career adaptability. The Chaos Theory of Careers emphasizes that an individual's career development relies on interaction with external social relationship networks and interplay with internal relational networks (Bloch, 2005; Bright & Pryor, 2005; Pryor & Bright, 2007). Strong social networks are closely linked to perceived social support (Cohen & Wills, 1985). Specifically, parental emotional and academic support play a crucial role in enhancing children's career maturity (Lim & Jung, 2024), which is a key indicator of psychological preparation and adaptability in career development. Likewise, both peer and parental support have been recognized as essential variables with significant positive impacts on career adaptability (Agoes Salim et al., 2023; Chen et al., 2024; Dewani & Nuzulia, 2024; Ghosh & Fouad, 2017; Xue, 2022; Zhao et al., 2022). By perceiving such support, individuals are more likely to set meaningful career goals, explore career opportunities freely, increase their motivation, and navigate the uncertainties and challenges of career development effectively (Ghosh & Fouad, 2017; Lent et al., 2000; Song et al., 2022; Zhou et al., 2022).

While perceived social support often plays a protective role, it is essential to acknowledge that its effects are not universally positive. Overly intrusive social support can exacerbate stress (Taylor, 2011). In other words, perceiving excessive support from parents may be misinterpreted as overly high expectations. Research shows that perceiving excessively high parental expectations not only increases individuals' confusion regarding their career

development path but also impairs their career adaptability (Zhou et al., 2020). Moreover, when the form of perceived social support is mismatched – for instance, receiving instrumental support when emotional support is desired – it can diminish the effectiveness of social support in alleviating stress (Taylor, 2011). This suggests that the impact of perceived social support on career adaptability may follow an "optimal level," beyond which it could have counterproductive effects.

Perceived social support often mitigates the adverse effects of ACEs and promotes career adaptability, but its protective role is not always consistent. In certain conditions, ACEs may reduce the availability and effectiveness of social support, highlighting its limitations. According to the Social Support Deterioration Model, ACEs serve as an early stressful event that reduces an individual's perception of the availability and effectiveness of social support (Barrera, 1986; Xiang et al., 2024). Additionally, Taylor (2011) notes that individuals in chronically stressful situations may be inclined to confide in their sources of social support, such as friends, about their distress. Over time, this action may alienate their support network, diminishing social support and exacerbating distress. Most importantly, such supportive social networks are difficult to access for those with childhood adversity, and the lack of social support itself exacerbates the negative effects of ACEs (Evans et al., 2013; Hoskins & Kunkel, 2022; McLafferty et al., 2019).

Discussion

This article reveals that ACEs have detrimental effects on career development and adaptability, with these effects primarily evident through the perspectives of parent-child relationships and family economic status. Fortunately, perceived social support plays a protective role in mitigating the negative impacts of ACEs. However, some controversies exist in the current literature.

First, as a traumatic event, ACEs can benefit individuals (Tedeschi & Calhoun, 1996). This suggests that the impact of ACEs on aspects like career development and adaptability may follow a nonlinear pattern. Similarly, the protective effect of perceived social support remains consistent, as overly intrusive support can heighten stress (Taylor, 2011). In other words, the protective effect of perceived social support may also be nonlinear, indicating that its protective capacity might vary in this way. Furthermore, previous studies have often treated perceived social support as a mediating or moderating variable, yet its combined effect with ACEs has rarely been examined.

Based on these gaps, future research could explore the following questions: First, do adverse childhood experiences exhibit both linear and nonlinear relationships with career adaptability? Second, does perceived social support also show both linear and nonlinear relationships with career adaptability? Third, how do adverse childhood experiences and perceived social support interact, and how does this interaction influence career adaptability? Lastly, what role does the combination of adverse childhood experiences and perceived social support play in shaping career adaptability? Research on these issues is urgent. Early experiences, particularly ACEs, critically influence individual development, often in unconscious ways. In China, many young adults continue to endure the consequences of ACEs, hindering their ability to succeed in personal and professional contexts. These negative experiences largely shape their perceptions of their future and career pathways.

In the context of Chinese collectivist culture, social support systems are particularly crucial. Research shows a complex interplay between ACEs and perceived social support. Therefore, investigating their combined effect on career adaptability holds significant research importance. Such studies could offer a new theoretical basis for exploring potential protective or risk factors associated with ACEs. Additionally, they could foster theoretical integration and methodological innovation in career development research.

Conclusion

This article draws several conclusions from the narrative review. First, ACEs have a detrimental effect on career development and adaptability, which can be seen through the lenses of parent-child relationships and family economic status. However, as a traumatic event, ACEs may motivate individuals to pursue personal growth. This serves as a reminder for career counsellors that when working with clients who have experienced ACEs, it is important to consider not only their current abilities, needs, and goals but also the influence of their early environment on career planning. For psychological counsellors, addressing clients with ACEs should involve not just a focus on the negative consequences but also guidance on how clients can derive benefits from their traumatic experiences.

Second, perceived social support plays a protective role in alleviating the negative effects of ACEs. Evidence suggests that, as a stressful event, it can lessen the impact of ACEs by reducing stress responses. Nevertheless, this protective role is not absolute; excessive social support can become intrusive and may even increase stress levels for individuals. This underscores the importance for those with ACEs to learn to effectively utilize the supportive resources available to them in finding a suitable career development path.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

This study only used ChatGPT and Grammarly for language polishing.

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The "Useless Class" Across Economic Contexts: AI, Globalization, and Socioeconomic Shifts

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Abstract

The rise of AI, globalization, demographic shifts, and economic restructuring has fueled concerns about the emergence of a "useless class"—individuals displaced from the workforce with little chance of reintegration. This literature review examines how labor displacement manifests differently across economies, shaped by automation, offshoring, financialization, and shifting labor demands. In OECD countries, job polarization due to AI and deindustrialization threatens middle-class employment, increasing inequality and political instability. In non-OECD countries, automation erodes informal and low-skill jobs, while globalization exacerbates economic precarity. Social consequences range from identity crises to mass migration. While OECD nations experiment with UBI and reskilling programs, developing countries face structural constraints. Without proactive policies, economic polarization will deepen, benefiting capital owners while displacing workers. Addressing these challenges requires coordinated global strategies that balance technological progress with equitable labor transitions.

Keywords: AI-driven labor displacement, agriculture sector, economic restructuring, globalization and automation, higher education sector, useless class, workforce reskilling

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Introduction

The rapid advancement of artificial intelligence (AI), combined with globalization, demographic shifts, and economic restructuring, has sparked concerns about the emergence of a "useless class"—individuals displaced from the workforce with limited opportunities for reintegration. While technological disruptions have historically led to new employment opportunities, the scale and speed of AI-driven labor displacement raise unprecedented challenges. This literature review explores how these disruptions manifest differently in high-income and developing economies, examining the roles of automation, offshoring, financialization, and shifting labor demands. It also evaluates policy responses such as universal basic income (UBI) and workforce reskilling to assess their effectiveness in addressing growing inequalities.

The concept of the "useless class" was first popularized by scholar Yuval Noah Harari in his book *Homo Deus: A Brief History of Tomorrow* (2016). Harari describes a potential future where AI, automation, and other technological advancements displace vast segments of the workforce (Harari, 2016), leading to the emergence of a new socioeconomic class—individuals who are not just unemployed but fundamentally unemployable due to a lack of necessary skills in an AI-driven economy. Unlike previous industrial revolutions, where displaced workers could transition into new labor sectors, AI-driven automation may permanently render many traditional jobs obsolete, creating large-scale economic exclusion.

The notion of the "useless class" is controversial, as it challenges conventional economic theories that suggest technological disruptions lead to job creation in new industries. While some economists argue that AI will complement human labor and generate new employment opportunities (Brynjolfsson & McAfee, 2014), others caution that the speed and scale of automation may outpace workforce adaptation (Acemoglu & Restrepo, 2019). Despite growing research on automation's impact on labor markets, literature gaps remain in understanding how this phenomenon manifests across different economic contexts. Most studies focus on OECD countries, where policy responses such as Universal Basic Income (UBI), workforce reskilling, and AI regulation are actively debated (OECD, 2019). However, less attention has been given to how AI-induced labor displacement affects non-OECD economies, where informal labor markets dominate, and institutional support for displaced workers is limited.

Additionally, existing research often overlooks the role of war, conflict, and political instability as compounding factors in labor market disruptions. Armed conflicts and geopolitical tensions not only displace millions of workers but also exacerbate economic fragility in both developing and advanced economies (Stromquist, 2019). War accelerates economic decline, destroys physical and institutional infrastructure, and limits workforce mobility. In conflict-affected regions, labor markets become highly volatile, with automation and globalization further intensifying employment precarity. The intersection of technological displacement and war-induced instability presents a unique challenge that has yet to be sufficiently explored in labor economics.

This study aims to bridge existing research gaps by conducting a comparative literature review of the "useless class" phenomenon across OECD and non-OECD economies. It examines how AI-driven labor displacement manifests differently in diverse labor markets, influenced by globalization, automation, economic restructuring, and geopolitical instability. Additionally, the study explores the implications of AI-driven job losses in two critical

sectors: agriculture, where automation is transforming traditional farming practices, and higher education, where AI and digitalization are reshaping skill demands and the role of academic institutions. A key focus is on assessing the effectiveness of policy responses, such as Universal Basic Income (UBI) and workforce reskilling programs, in mitigating the risks of large-scale labor displacement. Furthermore, this study seeks to identify potential pathways for inclusive economic transitions, ensuring that workers in AI-dominated industries—particularly in agriculture and higher education—can adapt to new economic realities through targeted policy interventions and adaptive workforce strategies.

By synthesizing existing research, this study contributes to the growing discourse on the future of work and highlights the urgent need for global policy coordination to ensure that technological advancements do not exacerbate economic inequalities (Manyika et al., 2018). As AI continues to reshape industries and economies, understanding the structural and regional variations in labor market transformations is crucial to developing equitable and sustainable policy interventions.

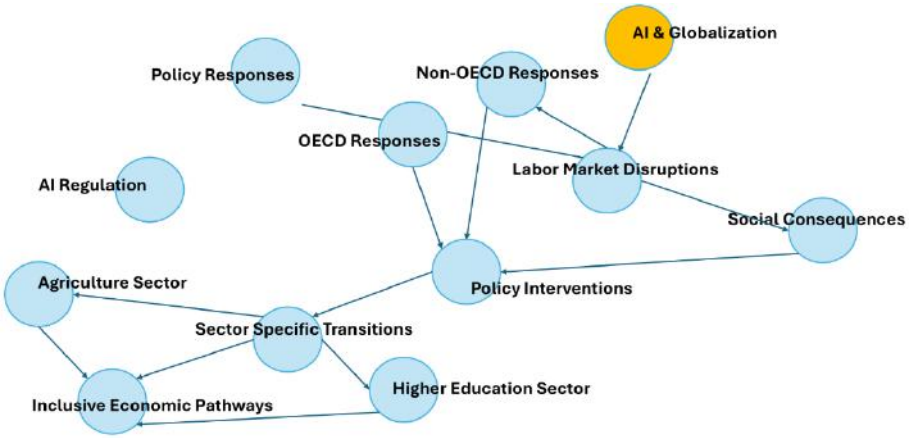
Methodology

This study employs a comparative literature review methodology to analyze how the concept of the "useless class" manifests across different economic contexts. The research synthesizes findings from peer-reviewed journal articles, economic reports, and institutional publications from organizations such as the OECD, World Bank, IMF. The focus is on understanding the macroeconomic trends, labor market dynamics, and policy responses shaping job displacement in both OECD and non-OECD economies.

The data collection and selection criteria for this study ensure a comprehensive and comparative analysis of AI-driven labor displacement across different economic contexts. Literature sources include academic databases such as Google Scholar and JSTOR, as well as policy reports and books by leading economists and sociologists, ensuring a well-rounded foundation of scholarly and policy-based perspectives. The time frame focuses on studies published after 2013, emphasizing recent developments in AI-driven labor transformations and their socioeconomic implications. Key themes guiding the selection process include AI automation, globalization, economic restructuring, war and political instability, social safety nets, and policy interventions, all of which shape labor market dynamics. This study employs a comparative approach, distinguishing between OECD countries and non-OECD countries to evaluate similarities and differences in how labor markets adapt to technological disruptions.

The conceptual framework proposed in Figure 1 illustrates the interplay between AI, globalization, and economic restructuring in shaping labor market transformations across OECD and non-OECD economies. It incorporates the key drivers, labor market disruptions, policy responses, social consequences, and sector-specific transitions that define inclusive economic adaptation.

Figure 1
AI, Globalization and Labor Market (by the authors)



AI and Job Polarization in OECD Economies

In OECD countries, AI and automation are reshaping labor markets by replacing routine and middle-skill jobs, leading to job polarization—a labor market split where high-skill, high-wage jobs and low-skill, low-wage jobs grow, while middle-wage jobs decline (Autor et al., 2013). Automation has significantly impacted sectors such as manufacturing, finance, and administrative services, where repetitive tasks are more susceptible to replacement by AI-driven systems (Acemoglu & Restrepo, 2019). As a result, middle-class employment has declined, exacerbating income inequality and wage stagnation (OECD, 2019).

High-skilled workers, particularly in AI development, data analysis, and software engineering, are seeing growing job opportunities (Brynjolfsson & McAfee, 2014). Meanwhile, low-wage service sector jobs, such as those in caregiving, hospitality, and food service, remain largely resistant to automation due to the requirement for human interaction (Manyika et al., 2018). However, these jobs often offer low wages, job insecurity, and limited career mobility.

Governments in OECD countries have responded with various policy measures. Some nations have experimented with Universal Basic Income (UBI) as a potential solution to widespread job displacement, as seen in Finland's pilot program (Van Parijs & Vanderborght, 2017). Other countries focus on reskilling initiatives, emphasizing STEM education, digital literacy, and vocational training to help workers transition into new industries (OECD, 2019). However, challenges remain, as not all displaced workers can easily adapt to high-tech industries, and the effectiveness of large-scale retraining programs remains uncertain (Stromquist, 2019).

The decline in middle-class jobs has also led to political and social instability, with increasing support for populist movements and anti-globalization rhetoric (Stiglitz, 2018). As AI continues to reshape the labor market, OECD nations must balance technological progress with social equity to prevent further economic polarization.

Globalization and Labor Displacement in Non-OECD Economies

Non-OECD countries face distinct labor market challenges as AI-driven automation intersects with globalization, economic dependency, and informality. Many developing economies have

historically relied on low-wage manufacturing and agricultural sectors, which are increasingly affected by automation and outsourcing (Rodrik, 2018). The shift in global supply chains has also led multinational corporations to relocate production, prioritizing technologically advanced automation systems over human labor (Autor et al., 2013).

A key issue is the lack of formal labor protections. Unlike OECD countries with structured employment regulations and social safety nets, many developing economies depend on informal work, where job displacement is harder to track and mitigate (Stromquist, 2019). As automation replaces repetitive and low-skill tasks, informal workers—who often lack digital literacy or access to retraining—face increasing economic precarity (Manyika et al., 2018).

Another major factor is global financialization, where the dominance of global capital markets influences labor structures. The expansion of digital platforms and gig-based employment has provided new economic opportunities but has also exacerbated income volatility and employment precarity (Krippner, 2005). As AI and algorithmic management become more prominent, workers in developing countries increasingly find themselves in low-wage, unstable gig work without benefits or long-term security (Venkataiah, 2025).

Additionally, war, political instability, and migration pressures further complicate labor market conditions in many non-OECD nations. Conflict-ridden regions suffer from economic destruction, weakened institutions, and forced displacement, limiting workforce adaptability (UNDP, 2020). War-driven migration often results in labor oversupply in urban areas, leading to wage suppression and heightened competition for already scarce jobs (Stromquist, 2019).

Specific cases illustrate the varied impacts of globalization and automation in non-OECD economies. In Vietnam, the garment and textile industry—a major source of employment—has seen increased automation, threatening thousands of low-wage jobs (Lan, 2020; Stromquist, 2019). Despite government efforts to promote digital literacy, many workers lack the skills needed for AI-driven manufacturing. In Bangladesh, automation in the ready-made garment sector has led to declining employment, with experts warning of an impending crisis if workers are not reskilled (Hillol Saha, 2024; Manyika et al., 2018). Ethiopia, which has positioned itself as an emerging manufacturing hub, faces similar challenges as global brands increasingly automate production to reduce costs (Gelan et al., 2022; UNDP, 2020). Meanwhile, in Argentina, economic instability and currency fluctuations have intensified labor precarity, with automation accelerating job losses in agriculture and logistics (Gasparini et al., 2020).

Governments in non-OECD countries face constraints in implementing policy solutions to mitigate labor displacement. Unlike OECD nations that experiment with UBI and workforce reskilling programs, developing countries often struggle with budgetary limitations, inadequate education systems, and corruption (OECD, 2019). Without international support and investment in AI literacy and vocational training, these economies risk falling further behind in the global labor market.

Social and Psychological Consequences of Labor Displacement

Beyond economic consequences, widespread labor displacement has profound social and psychological impacts. In OECD countries, the erosion of stable middle-class employment has contributed to rising mental health issues, social alienation, and political polarization. Studies show that long-term unemployment and underemployment correlate with higher rates

of depression and anxiety (OECD, 2019). The loss of stable jobs also leads to social fragmentation, where communities that once relied on industrial or middle-class service work struggle to redefine their identity in an AI-dominated economy (Manyika et al., 2018).

In the United States, regions formerly reliant on manufacturing have experienced a surge in opioid addiction and mental health crises, partly due to economic stagnation (Case & Deaton, 2020). Similarly, in France, AI-driven job losses in traditional industries have fueled growing distrust in political institutions, reflected in the rise of populist movements and widespread protests (Guiso et al., 2024; Guriev & Papaioannou, 2022).

In non-OECD countries, economic precarity leads to different but equally severe challenges, including higher crime rates, forced migration, and deteriorating living conditions (Stromquist, 2019). The lack of strong social safety nets means that workers displaced by automation face immediate income loss without retraining options (Hillol Saha, 2024).

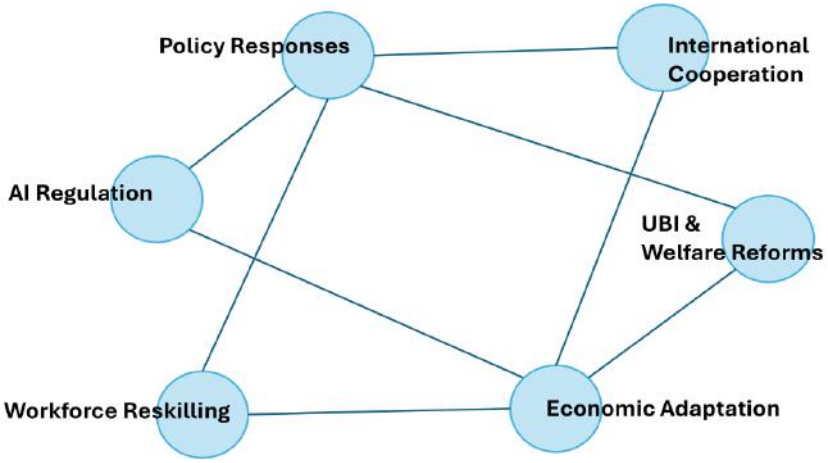
In South Africa, where youth unemployment is already high, automation threatens to deepen social inequality, leading to increased violent crime and social unrest (UNDP, 2020). In India, studies have linked the rise of digital gig work to mental stress and burnout, as workers experience job insecurity and algorithmic control over their labor conditions (Venkataiah, 2025).

Addressing these social consequences requires a broad policy response, including mental health support for displaced workers, investments in digital literacy, and stronger community networks to prevent social alienation. Without such measures, labor displacement caused by AI and globalization risks not only economic inequalities but also long-term societal instability.

Policy Responses and Future Considerations

Addressing the challenges of labor displacement requires coordinated policy efforts that consider both short-term economic disruptions and long-term structural transformations. Governments across OECD and non-OECD countries have adopted different strategies to mitigate the risks of AI-driven job losses, automation, and globalization. However, the effectiveness of these measures varies based on economic capacity, political stability, and institutional frameworks (OECD, 2019). Figure 2 draws the policy responses and future considerations necessary to address AI-driven labor displacement. It highlights four key strategies: Universal Basic Income (UBI) & Welfare Reforms, Workforce Reskilling & Education Reform, AI Regulation & Worker Protections, and International Cooperation & Economic Adaptation. These approaches serve as short-term interventions to mitigate job losses while also contributing to long-term structural transformations in the labor market.

Figure 2
Policy Responses and Future Consideration (by the authors)



One of the most debated solutions is Universal Basic Income (UBI), a policy that provides all citizens with a guaranteed financial stipend regardless of employment status. UBI pilots have been implemented in countries like Finland, Canada, and Spain, with mixed results (Van Parijs & Vanderborght, 2017). In Finland, a two-year UBI experiment showed that while recipients reported higher well-being and reduced stress, there was little measurable impact on long-term employment rates (Manyika et al., 2018). In developing countries, direct cash transfer programs, such as Brazil's Bolsa Família, have proven effective in reducing extreme poverty but do not fully address structural unemployment caused by automation (Stromquist, 2019).

Many OECD governments emphasize reskilling and lifelong education as key policy tools for adapting to AI-driven changes in labor markets (Autor et al., 2013). Countries like Germany and Singapore have successfully implemented vocational training programs and public-private partnerships to equip workers with digital skills. In Singapore, the SkillsFuture initiative exemplifies a comprehensive approach to fostering a learning society through strong collaborations between public and private sectors, facilitating continuous skills development and adaptability in the workforce (Fung et al., 2021). Similarly, Germany's vocational education and training system has effectively integrated digital competencies, enhancing social inclusion and employment opportunities through digital transformation initiatives (Busemeyer, 2019). In contrast, many non-OECD economies struggle with limited access to technical education, making it difficult for displaced workers to transition into new industries (UNDP, 2020). In India, for example, AI and automation threaten millions of jobs, yet only a small fraction of the workforce has access to reskilling programs (Kuriakose & Deepa, 2018).

As AI increasingly dictates labor conditions, governments are beginning to regulate algorithmic decision-making to ensure worker protections and fair wages (Stiglitz, 2018). The European Union's AI Act is one of the first comprehensive efforts to regulate AI technologies, including employment-related algorithms (OECD, 2019). In France, policymakers have proposed legislation to increase transparency in AI-driven hiring and workplace surveillance, acknowledging concerns over bias and discrimination (Guiso et al., 2024). In developing economies, however, regulatory oversight is often weak, allowing large corporations to exploit gig workers with low wages and precarious contracts (Stromquist, 2019).

Given the global nature of AI and labor market transformations, international cooperation is crucial to ensuring that technological progress does not deepen existing inequalities (Rodrik, 2018). Organizations like the ILO and the UNDP advocate for cross-border collaboration on AI ethics, digital education, and fair trade policies (UNDP, 2020). For example, the G20 AI roadmap encourages knowledge-sharing among nations to promote responsible AI adoption in both advanced and emerging economies (Manyika et al., 2018).

Looking ahead, governments must balance innovation with social stability. Investments in public education, mental health support, and universal healthcare will be critical in mitigating the social consequences of labor market disruptions (Case & Deaton, 2020). Additionally, policymakers must consider taxation models that redistribute AI-generated wealth, such as robot taxes or data dividend programs, to ensure that economic gains from automation benefit society as a whole (Piketty & Goldhammer, 2014). Without proactive intervention, AI-driven labor displacement will likely accelerate social polarization, economic inequality, and political instability. Governments must act swiftly to build adaptive labor markets that can withstand technological disruptions while fostering inclusive economic growth.

Inclusive Economic Transitions in Agriculture and Higher Education

The integration of AI and automation in various industries presents both challenges and opportunities for economic inclusivity. Two key sectors that require adaptive transitions are agriculture and higher education, both of which face significant AI-driven transformations that impact employment structures and workforce skill requirements.

Agriculture has historically been labor-intensive, but AI-driven innovations such as automated harvesting, precision farming, and drone-based monitoring are rapidly reducing the need for manual labor (Stromquist, 2019). While these technologies improve efficiency, they also threaten employment in regions heavily dependent on agricultural labor, particularly in non-OECD countries such as India, Nigeria, and Brazil (UNDP, 2020). Without intervention, millions of small-scale farmers risk displacement. To ensure inclusive economic transitions in agriculture, governments and institutions must implement targeted strategies that empower farmers to adapt to AI-driven advancements. This involves investing in digital literacy programs to equip farmers with the skills needed to adopt AI-based agricultural tools, enhancing productivity and sustainability. Additionally, promoting agritech entrepreneurship by supporting startups focused on AI-driven solutions for smallholder farms can foster innovation and economic resilience. Developing policy frameworks for AI integration in rural economies is also essential to ensure that technological benefits are not limited to large agribusinesses but also reach small-scale farmers. Furthermore, encouraging AI-assisted cooperative farming models can facilitate shared access to automation resources, reducing costs and preventing individual displacement while fostering community-driven agricultural sustainability. Case studies from China's smart agriculture initiatives (Li & Nanseki, 2022) and Brazil's AI-supported precision farming programs (Cao et al., 2025) show that integrating AI with farmer training and cooperative ownership models can mitigate labor displacement while improving productivity.

The higher education sector is experiencing a fundamental shift due to AI-powered automation in teaching, research, and administrative functions. Universities are increasingly incorporating AI-driven personalized learning platforms, automated grading systems, and virtual tutors, which reshape the role of educators (Jian, 2023). While these advancements can improve educational accessibility, they also pose risks to faculty employment and the

traditional model of higher education. To ensure an inclusive transition in higher education, policymakers and academic institutions must take a comprehensive approach. This includes redesigning curricula to integrate AI and data science as fundamental competencies across disciplines, equipping students with essential skills for an AI-driven economy. Additionally, workforce retraining programs should be expanded to help educators adapt to AI technologies, enabling them to work alongside automation rather than being displaced. Establishing ethical AI policies within universities is also crucial to regulate the extent of automation in academic settings, ensuring that AI enhances rather than replaces human instruction. Finally, strengthening international collaborations will facilitate the exchange of best practices for AI integration in education, promoting a balanced approach that leverages technology while preserving the critical role of human educators. Countries like Singapore and Finland, which have pioneered AI-driven education reforms while retaining strong human-centric teaching models, demonstrate that higher education can evolve alongside AI without eliminating the need for human educators (Lake, 2023).

Conclusion

The emergence of a “useless class” is not an inevitable consequence of AI and globalization, but rather a challenge that requires proactive intervention. While OECD countries struggle with job polarization and wealth concentration, non-OECD nations face economic precarity and migration pressures. Without deliberate policy measures to balance technological progress with labor market adaptation, economic disparities will continue to widen. A human-centered approach to AI integration, coupled with equitable economic policies, is essential to ensuring that technological advancements serve all members of society rather than exacerbating existing inequalities.

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Decivilization: Public Non-compliance With NPIs During the COVID-19 Pandemic

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Abstract

Non-pharmaceutical interventions (NPIs) are established by research as effective for controlling pandemics. COVID-19 incentivized much research into the effectiveness of NPIs, which confirmed their efficacy, indeed indispensability, for pandemic management. Yet the success or otherwise of NPIs in bringing the COVID-19 pandemic under control has obviously depended on the level of public compliance with these restrictions, especially in the pre-vaccination era. However, the NPIs were rather less successful in curbing the pandemic than commonly thought because their efficacy was compromised by substantial levels of public non-compliance. This paper contends that public non-compliance with NPIs may be explained to some degree by a concept of *decivilization*. Decivilization is not theorized here as regression of the modernization process, as Norbert Elias understood it, but rather as integral to the neoliberal mode of capitalism. Decivilization denotes cultural, social and political mechanisms at work in our globalizing world (especially neoliberalization, class polarization, and individualisation) that undermined the stringency of NPIs due to the harms they have inflicted on the social compact. This paper concludes that effective responses to future pandemics will depend not on technological solutions but on challenging decivilizing processes.

Keywords: COVID-19, decivilization, globalization, individualization, non-pharmaceutical interventions, neoliberalism

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Introduction

Non-pharmaceutical interventions (NPIs), at the centre of which is physical distancing, are established by a large body of research as effective measures for controlling pandemics. This was the case long before the novel coronavirus outbreak.[1] However, the COVID-19 crisis has incentivized a massive expansion of research into the effectiveness of NPIs, which has basically confirmed their efficacy, indeed indispensability, for pandemic management.[2] But the success or otherwise of NPIs (self-isolation, self-testing, reporting positive test results, avoiding social gatherings, respecting physical distancing, regular hand-washing, public mask donning, etc.) in bringing the current pandemic under control has obviously depended on public compliance with these practices. NPIs will be effective only if enough people acquiesce to the stringency of controls. Before vaccination, NPIs were the only line of defence for people against the virus. Given the tardiness and unevenness of the vaccine rollout internationally, these have been for much of the pandemic the primary defence mode for many peoples and governments.

However, as I will argue, the NPIs have been rather less successful in curbing the pandemic than they have usually been made out to be. This is because their stringency has been compromised by significant if not substantial levels of public non-compliance. Non-compliance to NPIs during the pandemic was a global phenomenon, but it was especially characteristic of the Global North, of the West in the North, or of the North Atlantic region. Non-compliance by literally billions of people to pandemic restrictions undoubtedly harmed the cause of public health worldwide, leading to hundreds of thousands of unnecessary deaths.

The argument that is outlined in this paper is that public non-compliance with NPIs may be explained to some degree as consequences of *decivilization*. Decivilization refers us to structural and cultural mechanisms of social malintegration that are at work in modern societies in our neoliberal "global" age. These mechanisms acted to erode public conformity to the NPIs owing to the harms they have inflicted on the social compact and community life. Decivilization is theorized as a powerful tendency of our social world in which (1) individualistic rights-cultures are increasingly ascendant over collectivist rights cultures, weakening pro-social values; (2) the social state and public welfare have been scaled back in support of free markets, consumer liberties, and entrepreneurial wealth generation; and (3) inequalities of wealth and income are radicalizing within and across borders, so that these are generating societies polarized by class divisions and with sizeable minorities mired in conditions of economic precarity.

Methodology – A Note on Data Collection

The data supporting measurement of comparative public health harms of the global pandemic that has informed this paper was obtained from the Worldometer dashboard primarily. Data supporting international comparative analysis of degrees or rates of compliance (and non-

[1] As is confirmed by a vast range of studies. For example: Ding (2014); Durham & Casman (2012); Glass et al. (2006); Karimi et al. (2015); Kelso et al. (2009); Lewnard and Lo (2020); Weston et al. (2018).

[2] See for example: Askitas et al. (2021); Banholzer et al. (2021); Brüggenjürgen et al. (2023); Chu et al. (2020); Dandekar et al. (2021); Fair et al. (2022); Flaxman et al. (2020a); Flaxman et al. (2020b); Giordano et al. (2020); He et al. (2022); Hsiang et al. (2020); Khataee et al. (2021); Kucharski et al. (2020); Kupferschmidt & Cohen (2020); Mohammadi et al. (2022); Neufeld et al. (2020); N'Konzi et al. (2022); Pozo-Martin et al. (2021); Salje et al. (2020).

compliance) with NPIs during key phases of the pandemic was distilled from YouGov self-report surveys.

NPIs and the Pandemic

I will start by examining levels and trends of public non-compliance with NPIs across successive phases (rising and receding waves) of the pandemic from March 2020 through to mid-year 2022. This is periodised as follows: (1) *initial and early (first-wave) non-compliance* (February–April 2020); (2) *mid-pandemic non-compliance* (April 2020–January 2021); and *late pandemic (vaccination and post-vaccination era) non-compliance* (January 2021–July 2022).

Phase 1: Initial and Early Non-compliance With NPIs (February-April 2020)

A substantial body of international research into public compliance with NPIs during the pandemic's first wave reveals a highly variable picture, with levels of compliance as high as 90 percent among some populations, but as low as 67 percent among others, by mid-April 2020 (Creaven 2024a, pp. 213-21). At the start of the pandemic, as the first wave grew, initial public compliance with lockdown policies was uniformly strong worldwide. However, virtually as soon as lockdowns were brought in, public compliance began to slip, as was revealed by a range of national studies, with radical non-compliance (or low compliers) varying from five percent up to 25 percent, with another sizeable group (of around 20 percent on average) made up of the occasionally or "somewhat" compliant (Creaven, 2024a, pp. 208-21).

Table 1
Compliance Rates With NPIs (Mid-April 2020): North Atlantic and Developed Oceania

Country	Avoiding crowds	Avoiding work (home working)	Improved personal hygiene	Object avoidance	Average
1. Spain	80%	45%	84%	66%	68.7%
2. Italy	87%	44%	76%	61%	67.0%
3. Denmark	86%	44%	83%	53%	66.5%
4. Australia	77%	32%	81%	69%	64.7%
5. Norway	80%	25%	86%	63%	63.2%
6. France	81%	34%	70%	59%	61.0%
7. UK	75%	37%	72%	56%	60.0%
8. USA	73%	27%	68%	58%	56.5%
9. Sweden	68%	26%	68%	52%	53.5%
10. Germany	66%	22%	71%	53%	53.0%
11. Finland	71%	17%	72%	51%	52.7%
Overall	**76.7%**	**32.1%**	**75.5%**	**58.3%**	**60.6%**

As is illustrated in Table 1, most people did not switch to home-staying and home-working in Europe, the USA, and Australia – even over the course of the pandemic's first wave. Here as well substantial minorities of people did not self-report conformity to other NPIs, even at the peak periods of conformity. This was when the first pandemic wave was near its peak and beginning to recede.

Rates and volumes of public compliance with these NPIs over the same basic timescale (from March up to April 2020), indeed from an earlier date in the development of the pandemic, were at their highest level by some distance in the Asia-Pacific region, and these were maintained over a much longer period. This was especially the case in most of the countries of Southeast Asia. This is shown by survey data from several case-examples: Malaysia, the Philippines, Thailand, Hong Kong, Vietnam, Singapore, Indonesia, and Taiwan (YouGov, 2022). I will refer to these as the Southeast Asia Eight.

Table 2
Compliance Rates With NPIs (Mid-April 2020): Asia-Pacific Southeast Asia Eight

Country	Avoiding crowds	Avoiding work (home-working)	Improved personal hygiene	Object avoidance	Average
1. Malaysia	86%	68%	84%	71%	77.3%
2.Philippines	81%	64%	80%	68%	73.3%
3. Thailand	86%	54%	87%	65%	73.0%
4. Hong Kong	81%	48%	86%	67%	70.5%
5. Singapore	84%	52%	83%	60%	69.8%
6. Indonesia	79%	55%	83%	56%	68.3%
7. Vietnam	77%	48%	78%	68%	67.8%
8. Taiwan	80%	26%	84%	63%	63.3%
Overall	**82.0%**	**51.9%**	**83.1%**	**64.8%**	**70.4%**

As can be seen from Table 2, public compliance with NPIs across the Southeast Asia Eight at mid-April 2020 was significantly higher under all NPI types under review than across the 11 countries included in the sample of countries from the developed Western world. This is despite the fact that this was a period in which the first pandemic wave was at a significantly lower level than in Europe and the USA. The overall non-compliance rate was 29.6 percent compared to 39.4 percent in the North Atlantic and developed Oceania. Even so, as is apparent, large minorities of people were self-reporting as non-compliant to these NPIs in both regions.

Phase 2: Mid-pandemic Non-compliance With NPIs (April 2020–January 2021)

But what of the fate of public responses to the NPIs beyond the rise and fall of the pandemic's first wave? Worldwide, NPIs remained in place in the context of phased unlocking of lockdowns, albeit scaled down, and were scaled up again in the context of later lockdowns, whether local or national. Throughout this period of greater or lesser restrictions, significant levels of non-compliance with NPIs was a constant, with a tendency to grow. New pandemic waves would motivate temporary upward spikes in public adherence to NPIs, but at lower scales than at previous peaks, albeit to greater or lesser degrees in different places, so that there was a downwards trajectory overall (Petherick et al., 2022).

As in the earlier period, however, countries of the Asia-Pacific did rather better those of the North Atlantic area in maintaining higher rates of public compliance with the NPIs. Here so-called "pandemic fatigue" appears to have had a lesser impact. This may again be illustrated by comparing the performance of countries in the two samples (YouGov, 2022).

Table 3
Compliance Rates With NPIs (Mid-January 2021): North Atlantic and Developed Oceania

Country	Avoiding crowds	Avoiding work (home working)	Improved personal hygiene	Object avoidance	Average
1. Spain	85%	20%	80%	57%	60.5%
2. Italy	80%	13%	72%	52%	54.3%
3. Australia	66%	21%	67%	55%	52.3%
4. UK	69%	27%	59%	47%	50.5%
5. Denmark	71%	26%	52%	47%	49.0%
6. Norway	68%	19%	63%	42%	48.0%
7. USA	67%	18%	60%	46%	47.8%
8. France	69%	15%	61%	43%	47.0%
9. Finland	65%	14%	63%	45%	46.8%
10. Germany	64%	17%	58%	46%	46.3%
11. Sweden	66%	13%	51%	44%	43.5%
Overall	**70.0%**	**18.5%**	**62.4%**	**47.6%**	**49.6%**

As is displayed in Table 3, by mid-January 2021, non-conformity rates with these NPIs had risen from 39.4 percent to 50.4 percent in the developed Western countries under review. This was at a time during which the second pandemic wave was breaking in the USA and Europe. On the same timescale, non-conformity with these NPIs had risen less sharply from 29.6 percent to 38.3 percent in the South Asia Eight, as is illustrated in Table 4.

Table 4
Compliance Rates With NPIs (Mid-January 2021): Asia-Pacific (Southeast Asia Eight)

Country	Avoiding crowds	Avoiding work (home working)	Improved personal hygiene	Object avoidance	Average
1. Malaysia	85%	42%	83%	66%	69.0%
2. Philippines	80%	47%	78%	65%	67.5%
3. Thailand	80%	41%	82%	65%	67.0%
4. Hong Kong	75%	40%	85%	67%	66.8%
5. Indonesia	72%	40%	79%	51%	60.5%
6. Vietnam	70%	22%	72%	56%	55.0%
7. Singapore	70%	21%	77%	48%	54.0%
8. Taiwan	69%	19%	77%	50%	53.8%
Overall	**75.1%**	**34.0%**	**79.1%**	**58.5%**	**61.7%**

Phase 3: Late (Vaccination Era) Non-compliance With NPIs (January 2021–July 2022)

The vaccination period and beyond, however, has seen public compliance with NPIs drop away steadily in the high-income countries (as the judicial sanctioning of these has been removed), just as lesser radical declines have been witnessed elsewhere. This is even though the pandemic (and the severe harms that COVID-19 was capable of inflicting on the vulnerable) was not ended by mass inoculation. The trend is revealed by survey data establishing declining conformity as a worldwide phenomenon (YouGov, 2022).

However, as is illustrated in Table 5, far lesser declines in public compliance with the NPIs were experienced in the Asia-Pacific, as exemplified by the Southeast Asia Eight, in comparison with Australia, North America, and Europe. Indeed, in Southeast Asia, certain of the NPIs retained the support of large minorities if not majorities of the public, whereas major public support for the NPIs was not retained in North America, Europe, or Australia (YouGov, 2022).

Table 5
Compliance Rates With NPIs (Mid-June 2022): North Atlantic, Developed Oceania, and Southeast Asia

Country	Avoiding crowds	Avoiding work (home working)	Improved personal hygiene	Object avoidance	Average
1. Taiwan	69%	33%	78%	55%	58.8%
2. Thailand	70%	29%	73%	55%	56.8%
3. Hong Kong	62%	22%	77%	52%	53.3%
4. Philippines	67%	24%	71%	50%	53.0%
5. Malaysia	70%	19%	73%	48%	52.5%
6. Indonesia	49%	18%	70%	35%	43.0%
7. Singapore	54%	15%	65%	36%	42.5%
8. Vietnam	46%	18%	53%	37%	38.5%
9. Italy	51%	4%	49%	29%	33.3%
10. Spain	46%	7%	52%	26%	32.8%
11. USA	44%	10%	43%	28%	31.3%
12. France	45%	6%	44%	26%	30.3%
13. Australia	40%	9%	41%	30%	30.0%
14. Germany	42%	6%	38%	27%	28.3%
15. Finland	29%	6%	39%	22%	24.0%
16. Norway	22%	5%	34%	28%	22.3%
17. Denmark	19%	4%	34%	25%	20.5%
18. Sweden	27%	7%	25%	21%	20.0%
19. UK	26%	4%	29%	18%	19.3%
Overall	**46.2%**	**12.9%**	**52.0%**	**34.1%**	**36.3%**

Average rate of compliance across the four NPIs under review was 49.8 percent by midyear 2022 for the Southeast Asia Eight compared to 26.5 percent for the North Atlantic/Oceanic Eleven (YouGov, 2022).

The Pandemic and Public Mask-Wearing

So far I have considered data on conformity and non-conformity to the major NPIs – with one exception. This exception is mask-wearing. I will now examine mask-wearing as a standalone phenomenon. This is because mask-wearing is a good gauge of the strength of pro-social motivations in a society because this confers health protections not so much on the wearer but on those whom the wearer comes into proximity within public places. Mask-wearing, then, may be viewed as indicative of empathic concern for community others rather than as behaviour motivated by fear or self-interest.

Now, throughout the global pandemic (up to mid-year 2022), public rates of mask-wearing were generally much higher outside the West, beyond the North. They were highest – and consistently so – in the countries of Southeast Asia (Creaven, 2024a, pp. 239-41). This was even though NPIs were legalized to differing degrees in these countries, which were also experiencing highly variable rates of vaccine coverage during this period. This is illustrated in Table 6.

Table 6
Public Mask Wearing March 2020–July 2022, North Atlantic, Developed Oceania, and Southeast Asia

Country/territory	Mar-Apr 2020	Dec 20-Jan 2021	Sep-Oct 2021	Jun-Jul 2022	Average
1. Hong Kong	87.4%	84.6%	89.0%	86.5%	86.9%
2. Taiwan	86.3%	83.2%	84.0%	85.5%	84.8%
3. Thailand	82.3%	85.0%	84.8%	80.0%	83.0%
4. Malaysia	71.1%	89.6%	84.0%	83.5%	82.0%
5. Philippines	74.2%	85.8%	79.3%	80.5%	80.0%
6. Singapore	52.2%	89.4%	88.5%	83.5%	78.8%
7. Vietnam	80.3%	79.8%	77.3%	66.0%	75.9%
8. Indonesia	66.1%	83.2%	75.3%	76.5%	75.3%
9. Italy	67.3%	83.5%	78.1%	55.0%	71.0%
10. Spain	50.0%	86.7%	81.9%	50.0%	67.4%
11. France	27.2%	79.0%	73.7%	42.8%	55.7%
12. USA	29.8%	79.0%	59.8%	42.4%	52.8%
13. Germany	13.7%	73.2%	61.0%	40.0%	47.0%
14. Australia	19.4%	58.3%	67.3%	42.5%	46.9%
15. Finland	2.5%	72.3%	65.7%	26.0%	41.6%
16. UK	6.6%	74.2%	58.8%	22.5%	40.5%
17. Norway	5.0%	55.0%	34.3%	11.4%	26.4%
18. Denmark	2.4%	67.0%	11.8%	5.0%	21.6%
19. Sweden	3.4%	22.5%	19.8%	10.3%	14.0%
Overall	**43.5%**	**75.3%**	**67.1%**	**52.1%**	**59.5%**

As we have seen, the marked difference in rates of public compliance with public mask-wearing in the North Atlantic region and in Developed Oceania compared to the Asia-Pacific region during the pandemic was replicated in the case of other NPIs (Creaven, 2024a, pp. 213-29).

Now this (YouGov, 2022) data evidences more effective, proactive pandemic management policies in the Asia-Pacific region compared to those in the North Atlantic and Australia, of course. But it is also indicative of a higher degree of public acceptance of and support for such policies in Southeast Asia than in the North Atlantic and Developed Oceania. This is likely a major reason why these countries have out-performed those of the North Atlantic in terms of minimizing both public health and economic harms (Creaven, 2024a, pp. 241-45; Nanda & Ryan, 2022). The differences in pandemic performance between countries of the North Atlantic region and those of Southeast Asia may be gleaned from Worldometer (2024). These are displayed below in Table 7:

Table 7
COVID-19 Mortalities: Southeast Asia, North America, Western Europe (3 April 2024)

Country		Total mortalities	Mortality rate per million
1.	China	5,272	4
2.	Laos	758	101
3.	Cambodia	3,056	178
5.	Singapore	2,024	341
6.	Vietnam	43,206	437
7.	Thailand	34,581	493
8.	Indonesia	162,063	581
9.	Philippines	66,864	594
10.	Japan	74,694	595
11.	South Korea	35,934	700
12.	Taiwan	19,005	796
13.	Malaysia	37,348	1,126
14.	Hong Kong	14,924	1,263
15.	Netherlands	22,922	1,336
16.	Denmark	8,814	1,511
17.	Canada	59,034	1,538
18.	Switzerland	14,452	1,647
19.	Ireland	9,941	1,891
20.	Norway	6,638	1,204
21.	Luxembourg	1,232	1,918
22.	Finland	11,958	2,153
23.	Germany	183,027	2,182
24.	France	167,642	2,556
25.	Spain	121,760	2,606
26.	Sweden	27,407	2,682
27.	Portugal	28,126	2,774
28.	Belgium	34,376	2,946
29.	Italy	196,487	3,261
30.	UK	232,112	3,389
31.	USA	1,219,487	3,642
32.	Greece	37,869	3,671

How might we explain the higher degree of public buy-in to the NPIs in Southeast Asia compared especially to the Western world? I have argued that this may be because the cultures of the Asia-Pacific countries – especially those of Southeast Asia – are rather less individualized than those of the West (Creaven, 2024a, 241-45). This argument is supported by research conducted by Silova et al. (2021). This attributed the resistance by publics and governments in the West to legally-mandated NPIs as resulting from what they define as "excessive individualism". Their study draws upon a cross-country scale of degrees of individualism in different parts of the world.[3] These degrees of individualism are enumerated, with a score of 100 attributed to countries that could in theory manifest "complete individualism" and a score of 0 attributed to those that could in theory manifest "complete collectivism". Based on this comparative-statistical analysis, Silova et al. attributed a mean

[3] This is based on Geert Hofstede's ideal types of individualism and collectivism. See: Hofstedet et al. (2010).

score of 38.3 to the Asia-Pacific countries on the individualism-collectivism scale compared with a mean score of 64.9 for the North Atlantic countries (Silova et al., 2021).

Silova et al.'s analysis correlated the excess individualism of the North Atlantic cultures with lower public support for NPIs, including mask-wearing in public places. Conversely, more public support for the NPIs in Asia-Pacific countries was correlated with the higher degree of collectivism *vis-à-vis* individualism of their cultures (Silova et al., 2021). Yet perhaps the issue is not so much that there is "too much" individualism, especially in the West and in the North, exercising a corrosive impact on pro-sociality. Rather, perhaps the issue is more a question of the nature of the particular modes of individualism that are excessive. Individualism *per se* is not necessarily corrosive of the social bond. However, certain modes of modern individualism (economic, consumerist, wholly and narrowly rights-based, etc.), which are culturally ascendant in Westernized cultures, undoubtedly are. This is because these are egocentric to the core.

Decivilization and the Pandemic

The range of studies documenting compliance and non-compliance with the NPIs raises the legitimate concern that even though persisting NPI restrictions did succeed in depressing caseloads their efficacy was probably significantly less than would have been the case if compliance was higher. Public non-compliance (or rather the non-compliance of large numbers of people) increased the number of hospitalizations and deaths. The pandemic was not merely a story of government failure but of community failure. This was especially a failure of the publics of the West and of the Global North. My argument is that this failure may be understood as a consequence of decivilization.

According to Norbert Elias, decivilization denoted interruptions and reversals of the civilizing process (Elias, 1991, 2000). The civilization process in turn was simply the modernization process conveyed by the development of the nation state and commercial society. For Elias, the formation of national citizenries and the acceleration of markets progressively undermined inter-group and intra-group antagonisms and made for increasingly cohesive, integrated societies (Elias, 1991, 2000). However, contrary to Elias, decivilization may be understood not as a reversal of civilizing processes but as the "other face" of these same processes.

Decivilization and Individualism

This "other face" of modernization includes the nurturing of cultural sensibilities in people that are corrosive of the social bond and which therefore weaken collective responses to crisis events such as COVID-19. Decivilizing mechanisms in the cultural sphere are energised by egocentric rights-focused individualisms driven to some degree by a sense of consumer entitlements that licenses people to make self-centred cost-benefit decisions over whether to follow social rules or to disregard them. Egoistic individualisms allowed people to see it as their right to determine whether or not they should obey NPIs based on consideration primarily of their own best interest (Creaven, 2024a, pp. 247-50; Ryan & Nanda, 2023, p.107; Sachs, 2021, p. 100).

These enabled people to make decisions on whether or not to comply with NPIs on the basis mostly of judgements of self-risk, or of risk to intimates in their interpersonal circles, rather than on the basis of *societal* risk, i.e. risk to the unacquainted multitude of a wider

community. Such a "rational" calculus would be made on the basis of judgement on the likelihood or odds of they themselves (or those dear to them) becoming ill from COVID-19 balanced against the personal inconvenience of compliance with NPIs on behalf of others (Creaven, 2024a, p. 248). This is indicative that the biggest motivator of conformity to pandemic NPIs for most people – at least in the West – was not pro-social values (desire to protect people in general or vulnerable others) but "functional fear" of the harm that COVID-19 may cause to oneself and to one's loved ones. Such is supported by survey data (Wright et al., 2021).

Such explains the decline in public compliance with NPIs that set in almost from the start of the pandemic – especially in the North Atlantic region. This happened because as people's "risk perceptions" of viral hazards were reduced, which happened over time as they evaded serious illness or as they perceived known others evading serious illness, they were incentivized to reduce or abandon their compliance with NPIs. In effect, they abandoned the Generalized Other (including "vulnerable others") to their fate. Belief that COVID-19 was low risk to one's own self and to those in one's own intimate circle was indeed one of those factors most commonly associated with non-compliance (Olsen & Hjorth, 2020; Rasul & Giuliano, 2020; Tomczyk et al., 2020). This is why people who believed that the virus was low risk had the lowest self-reported compliance overall, according to research (Wright et al., 2022). This was also one important reason why non-compliance in the pandemic was much more associated with young adults than with senior adults (Hills & Eraso, 2021; Kamenidou et al., 2020; Oosterhoff & Palmer, 2020; Six et al., 2021; Wright & Fancourt, 2021). Young people were simply those least likely to be made seriously ill from catching COVID-19.

These modes of individualism also licensed people to regard the temporary imposition of relatively trivial inconveniences (e.g. wearing a face mask in a public setting, or maintaining physical distancing) as a grievous assault on entitlements, injurious to self and personal wellbeing. Therefore, a commonly stated reason for flaunting NPIs was the need to uphold individual freedoms – especially freedom of association and of consumer and leisure opportunities. Even the "liberty" of disregarding mask-wearing norms was upheld by some as integral to citizenship. This close identification of personal liberty with unbridled freedom to pursue the libidinal pleasures, in the tooth and claw of the pandemic, was aptly expressed by an American social media poster who declared that "at the end of the day, I'm not gonna let it stop me from partying" (Cummings, 2020).

This arguably shows that an important motivation for non-compliance with NPIs among many was indeed this narrow subjectivized perception of (usually consumer-focused) rights and entitlements that leaves no room for recognizing communal or social obligations. Individualized rights-consumerism is thereby established as a force of decivilization in that this subordinates the social to the personal and in doing so undermines collective wellbeing and community solidarity. Owing to the prevalence of such individualisms in contemporary cultures, pandemic management policies were placed under pressure to compromise stringency of NPIs that have been shown to be necessary to curb outbreaks, ease pressures on healthcare systems, and save lives. This was in order to maintain higher levels of public compliance with lesser measures that were experienced as less burdensome.[4]

[4] N'Konzi et al. (2022) actually recommend this dilution of stringency of controls to prevent non-compliance. This is even though they acknowledge that stringency of NPIs is necessary to curb pandemics. Basically, their pragmatism takes as given that people are unreformable because the culture that supports and nurtures narrow rights-based individualism is also taken as a given.

Decivilization as individualization, I contend, is a pervasive feature of all contemporary cultures. But this is especially the case in the developed countries where consumerism extends into all corners of social life. This quite plausibly may account for the sharp variations in conformity to the NPIs between the developed West and much of the Global South, including and especially Southeast Asia. But decivilization as the"other face" of modernization has a structural as well as cultural aspect.

Decivilization and Injustice

This manifests especially as the reproduction of ever-deepening inequalities by social class within countries and internationally under the auspices of intensifying international capitalist competition (Alvaredo et al., 2018; Creaven, 2024a; Piketty, 2014; Westergaard, 1995). The hardening of the injustice of inequality since the closing decades of the twentieth century has furnished the multitude of working poor – included amongst which are the so-called precariat of low-income, low-status, (mostly) service sector, disproportionately informal sector, often zero-hours contracted employees – with compelling economic reasons to set aside those pandemic NPIs that would undermine their ability to make ends meet or partake (albeit on the fringes) of consumer opportunity.

Not only that, but this also ferments in many of them distrustful resentments and antagonisms towards "wealthy achievers" (to borrow a term from the *British Crime Survey* of a few years ago) and towards political establishments supportive or tolerant of social orders in which they are marginalized. Such further weakens, for millions of people, at least in potential, collective responses to pandemic events such as COVID-19. Disunified populations riven with distrust and rancour, fermented by hyper-competition and grossly asymmetric returns in deregulated labour markets (Brown, 2015, 2019; Cooper, 2017) are not likely to purvey unified community responses to crises such as global pandemics. This is because these depend on people believing they are all "in the same boat", and "all for one and one for all", facing the same privations, which runs into the buffers of privilege and deprivilege, of advantage and disadvantage (Creaven, 2024a, pp. 246, 250-52).

Radicalizing social inequality between groups is certainly a source of decivilization, since this increases feelings of injustice among those at the wrong end of these divides alongside a sense of insecurity owing to the sense of precarity they experience. This would also explain the phenomenon of mistrustful alienation from the political authority of the state that is especially to be found among large numbers of the poor and ethnically oppressed in developed countries such as the UK and USA (Brown, 2019; Creaven, 2024a). Such feelings are not devoid of a rational basis because in fact class polarization has been driven not simply by untrammelled market forces but by neoliberal policies of government that have imposed these forces on the world and which in doing so have empowered and enriched corporate elites at the expense of wage-earners. This is part of the explanation of why wild conspiracy stories claiming that state-mandated NPIs and vaccination programmes were serving the "hidden agendas" of power tended to go viral on social media during the pandemic.

Decivilization and the Assault on Public Life

The neoliberal age has brought about a general diminution of public life across the globe, albeit to varying degrees, depending on the degree of neoliberalization of state policy-making in different countries (Clarke & Newman, 1997; Dumenil & Levy, 2004; Glyn, 2006; Leys, 2003). Such has resulted from the retrenchment of the welfare state (Fallov & Blad, 2018).

Howard, 1997; Kus, 2006; Law & Mooney, 2007; Pierson, 2002; Piven, 2015; Taylor-Gooby, 2013; Toynbee & Walker, 2017a; Toynbee & Walker, 2017b), the privatization or marketization of public services such as health, housing, education and social care (Ball, 2012; Callinicos, 2006; Carey, 2019; Clarke et al., 2005; Gilbert, 2002; Giroux, 2014; Gosling, 2013; Hermann, 2010; Himmelweit, 2014; Jones, 2015; Krachler & Greer, 2015; Lynch et al., 2012; Pollock, 2003; Rikowski, 2006; Whitfield, 2001, 2013), and (in the UK, EU and the USA) more than a decade of austerity politics (Blakeley, 2018; Brown, 2015; Creaven, 2023; Mendoza, 2015). This attack on collective life has reinforced the tendencies of the capitalist mode to atomize or individualize the citizenry on the terrain of economistic, familial, and consumerist self-interest (Brown, 2015, 2019; Cooper, 2017). This is by basically dismantling social-welfare support structures for people's lives, thereby forcing them into greater reliance on strategies of self-reliance, self-care, and self-advocacy, in competition with and in opposition to other people.

Neoliberal reforms have thus weakened the institutional and cultural redoubts against instrumental individualism and social injustice that were constructed in the developed countries in the postwar era. This has rendered those people most adversely impacted by the assault on public life (especially on social and welfare support services) especially vulnerable to decivilizing pressures. For these are least included in and most marginalized – economically, politically and culturally – from the life of a society. These people are the ones most likely to have lower trust or confidence in government – and low trust in political authority is established by a number of studies as a factor of non-compliance with pandemic NPIs (Creaven, 2024a). These people are also more vulnerable to feelings of detachment from community life or pro-social values – which is also a factor associated with non-compliance with pandemic NPIs, according to research (Creaven, 2024a).

Such supports the decivilization thesis as an explanation of non-compliance with pandemic NPIs. Decivilizing processes are those which weaken or undermine people's identification with normative and civic order. This would account for why non-compliance with pandemic NPIs was much more common among the economically deprived and racially oppressed than among others, according to research (Creaven, 2024a; Ganslmeier et al., 2022; Garnier et al., 2020; Ölcer et al., 2020). The non-compliant were drawn especially from the "precariat" – the casualized or semi-casualized ranks of the lower working class, the denizens of the G-economy, whose members are drawn especially from the ethnically oppressed. For them, one likely reason for this was that the community-bonding rhetoric of national togetherness spun by governments that was intended to bind people to the NPIs did not chime with their experiences of marginalization and exclusion from civil society and of disregard by the state.

This perspective is supported by research looking at social media postings during the pandemic. People cited fear of redundancy or loss of vital income ("money to survive" in opposition to protecting health) as reasons for disregarding "stay at home" guidance or restrictions, for example. They also expressed scepticism over the sufficiency of support for stay-at-home workers. Government aid was thought to be skewed towards big business and the wealthy rather than "the likes of us", i.e. ordinary wage earners and the genuinely needy (Ölcer et al., 2020, p. 6). Postings such as these not only expressed class realities and their attendant grievances but also a lively anti-corporate and anti-neoliberal sensibility. This was hardly arbitrary but was evidence-based and experiential.[5]

[5] As is demonstrated by Robert Brenner's (2020) analysis of government pandemic financial assistance programmes in the USA.

Conclusion

Decivilization is not simply a story of *exceptionalism* – of the "breakdown" of modernity or of a temporary "fall-back" or "regression" to a more uncivil premodernity, as Elias contends. Rather, this is part of the story of capitalist modernization itself. The civilizing process is, I contend, simultaneously a decivilizing process. Decivilization is the consequence of the damages inflicted on the social bond by the impacts of the free enterprise economy, by a narrow individuated consumer-oriented rights culture, and by the undermining of public and community life in the service of private commercial interests by the neoliberal state. Decivilizing processes are those which weaken or undermine normative order and the sense of a collective bond that would bolster community-level obligations or commitments.

The unevenness and inconsistency of the people response to those pandemic NPIs exhorted or mandated by political authorities across the world has brought these chickens home to roost. For these threw into stark exposure the baneful impact of decivilizing pressures in exacerbating and prolonging the COVID-19 crisis. The pandemic was undoubtedly a story of political failure as neoliberal governments prioritized profits over public health. This was evidenced by vaccine nationalism and imperialism on an international scale (Creaven, 2024a), deferred lockdowns and fast-tracked de-escalation of lockdown protections in countries such as the UK (Creaven, 2023), in some cases even a refusal to mandate NPIs or to encourage public scepticism regarding their efficacy (Creaven, 2023, 2024a). But this was also a story of community-level failure to deliver sufficiently on public health protections – especially and disproportionately (though not exclusively) in the high-income countries of the Global North (Creaven, 2024a; Sachs, 2021).

The deleterious impacts of an individualism of rights without responsibilities, and of the divisions and exclusions of class and status, as these have radicalized in the neoliberal era, are fracturing the societal bond. During the pandemic, these conduits of decivilization undermined the force of government narratives making appeal to a unitary community ("we're all in it together") to solidarize public compliance with the NPIs. These experiences do not bode well for humanity's prospects in the event of another global pandemic. Such is far from unlikely in the none-to-distant future under conditions of zoonotic accelerationism (Creaven, 2024b, pp. 4-6, 212-14, 255, 285). A global pandemic potentially more harmful than COVID-19 within a few decades is feasible. However, the relatively strong performance of Southeast Asia in reducing pandemic harms offers a glimmer of hope that the world could do better next time. This is because these benefits were demonstrably earned by peoples who made a decent fist of the NPIs, and who did so because their cultures were less individualized and more pro-social than many others. The West in particular has lessons to learn.

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Betrayal Story: Is It a New Storytelling Marketing?

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Abstract

Mie Gaga, an Indonesian instant noodle brand, became trending due to the emergence of content on social media X and TikTok regarding a past conflict between the owners of Mie Gaga and Indomie. One of the account owners on X and TikTok created content about the story of the split between Djajadi-Salim partnership regarding Indomie, which stated that the Mie Gaga brand came from the initial shareholder of Indomie who was "removed" by other shareholders. This story then went viral on many social media and news portals. This study aims to analyze storytelling content in tweets and videos regarding the feud between Mie Gaga and Indomie, as well as to analyze whether this phenomenon is a form of marketing communication strategy. Storytelling marketing is used as literature to analyze the study results. This study uses a qualitative approach through the multimodality method in social semiotics to understand the meaning of texts in the media. The results of this study indicate that photos, videos, and several narratives contain elements of product promotion while using a storytelling style to build relationships with the audience. In that storytelling, the content carries the company's personal story which is packaged emotionally and highlights its position as a "victim" of the Mie Gaga and Indomie feud. This viral feud on X and TikTok can be considered as a form of storytelling marketing. Thus, authentic and emotional storytelling marketing can be used as a communication tool in building relationships between brands and consumers.

Keywords: Mie Gaga vs Indomie, multimodality social semiotic, storytelling marketing

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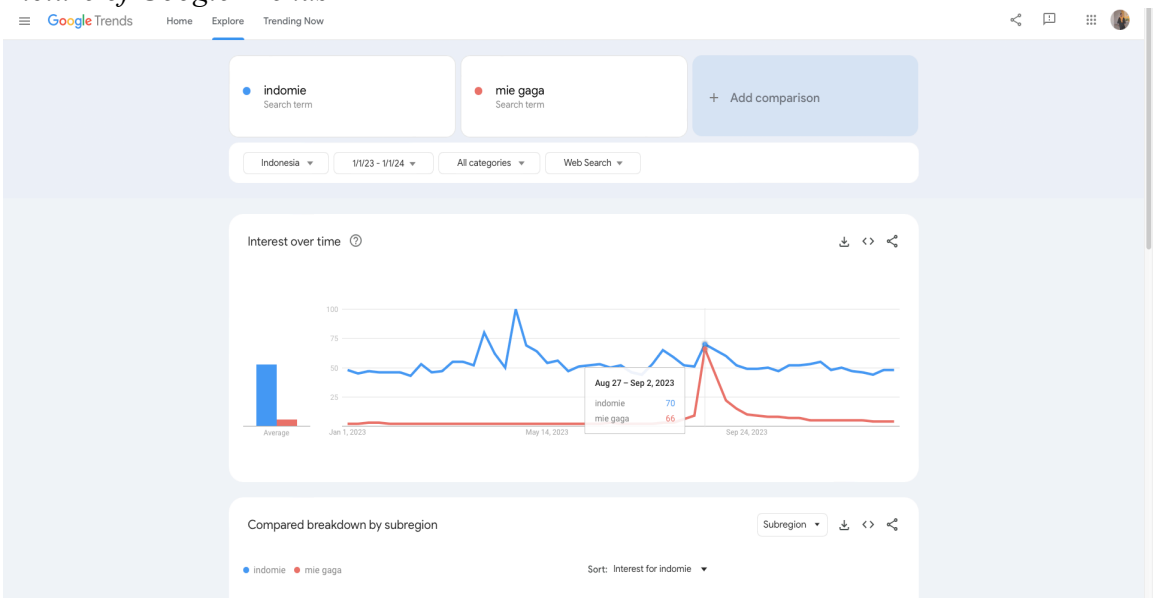
Introduction

Mie Gaga, one of the instant noodle brands in Indonesia, became a keyword that was often searched in the Google from July to September 2023. The keyword became trending due to the emergence of a thread regarding a past conflict between the owners of Mie Gaga and Indomie. User account on X and TikTok created content about the story of the split between Salim-Djajadi partnership regarding Indomie, which stated that the Mie Gaga brand came from the initial shareholder of Indomie who was "removed" by other shareholders. Hence, the conclusion arose that the founder of Mie Gaga was the original owner of the Indomie brand. This story then went viral and was often republished on many social media and news portals.

Figure 1
Picture of Google Trends



Source: Google Trends (2024)

The story then made people flock to compare Indomie and Mie Gaga products. Many Mie Gaga product review contents emerged, indicating a large number of purchases of the product. It did not stop there, the public also boycotted Indomie products, causing Indomie shares to fall by 4,9% since the story went viral (Taufani, 2023). Based on this phenomenon, the writers are interested in examining whether it is a marketing communication strategy carried out by the Mie Gaga company, given that Indomie instant noodles are still the most widely consumed products in Indonesia so far. However, the owner of Mie Gaga himself denied the narrative that the issue was initiated by their company (Puspadini, 2023). Nonetheless, if we look from a broader perspective, it becomes a big question of who might know about the company's internal conflict, if not the company's party itself. Furthermore, the initial uploader of the story has closed his/her account, right after the story rolled into a conversation in society.

At a glance, the feud between Mie Gaga and Indomie can be considered as storytelling marketing. Storytelling marketing is one of the marketing communication strategies that relies on the power of stories. Storytelling marketing on social media can serve various effects, including attitudes toward brands, positive word of mouth, sharing, promoting, and viewing (Coker et al., 2017). The effects of this storytelling strategy look similar to the

phenomenon of the owners of the instant noodle companies mentioned above, starting from viewing the content and sharing a trend, to participating in promoting.

The form of storytelling marketing that is often created is usually a story of a brand's journey, philosophy, or activities, such as social activities from the company. While in the story of Mie Gaga, it is the owner's personal story, which has been proven to drive consumer behavior. Thus, it requires more in-depth research and analysis starting from the origin of the story's emergence on social media, as well as in-depth examination to understand whether the content regarding the circulating story is a form of new storytelling marketing.

Literature Review

As time goes by, brands and companies face challenges in attracting the audience's attention, especially consumers. With easy access to information via the internet and social media, brands struggle to leave a memorable impression on the audience. Consequently, companies have started to incorporate more engaging and personalized methods, among which storytelling techniques stand out (Gensler et al., 2013; Pulizzi, 2012). Lindawati (2018) added that stories are used as content marketing due to the public's saturation of commercial persuasive messages and the growth of public awareness of good business ethics. Stories can influence attitudes, beliefs, and behavior (Lin & Liou, 2016; Mandung, 2024). The theoretical implication is that storytelling enriches the brand's symbolic meaning, creating a narrative that allows consumers to view the brand as an integral part of their personal values and identity (Mandung, 2024).

Storytelling strategies have several different forms, there are data-driven storytelling, philanthropic storytelling, customer-led storytelling, and immersive storytelling or visual storytelling (Lindawati, 2018). Data-driven storytelling uses data as story content. Through the presentation of complex data with simple language, it is expected to raise awareness of a problem. The second strategy is philanthropic storytelling as a fulfillment of consumer demands for transparency and the desire to know more about the company, such as how they run the business, treat their workers, their work ethics, and how they source raw materials. This is related to the increasing global awareness of good business. The third strategy is customer-led storytelling where data shows that 92% of people trust peers more than conventional advertising. Therefore, presenting successful stories from users will increase public engagement towards the social business. In addition, there is immersive storytelling or visual storytelling, which is a marketing strategy that utilizes interesting narratives, puts consumers at the heart of the story, and realizes it with emotional visual media to build consumer shopping experiences.

In storytelling marketing, many important components significantly influence the success of a narrative in attracting consumers and enhancing brand perception. These components include setting, characters, storyline, conflict, and message, which collectively construct a unified narrative that will ultimately influence the audience. These five elements are essential for effective storytelling as they produce an integrated narrative experience that captivates the audience's attention and fosters an emotional connection (Susilowati et al., 2024). Additionally, the digital landscape has revolutionized storytelling marketing, allowing brands to leverage multiple platforms to spread their narratives. Furthermore, social media functions such as ads, stories, and reels facilitate the development of interactive storytelling content, thereby enhancing marketers' ability to engage consumers and deliver their messages effectively (Mavilinda et al., 2023). This is in line with the conclusion drawn by Kemp et al.

(2021) who asserted that the dissemination of compelling narratives is essential to engage customers, especially in the online context where engagement can greatly impact business outcomes. The importance of conflict in storytelling cannot be underestimated, as it acts as a catalyst for narrative development and promotes engagement.

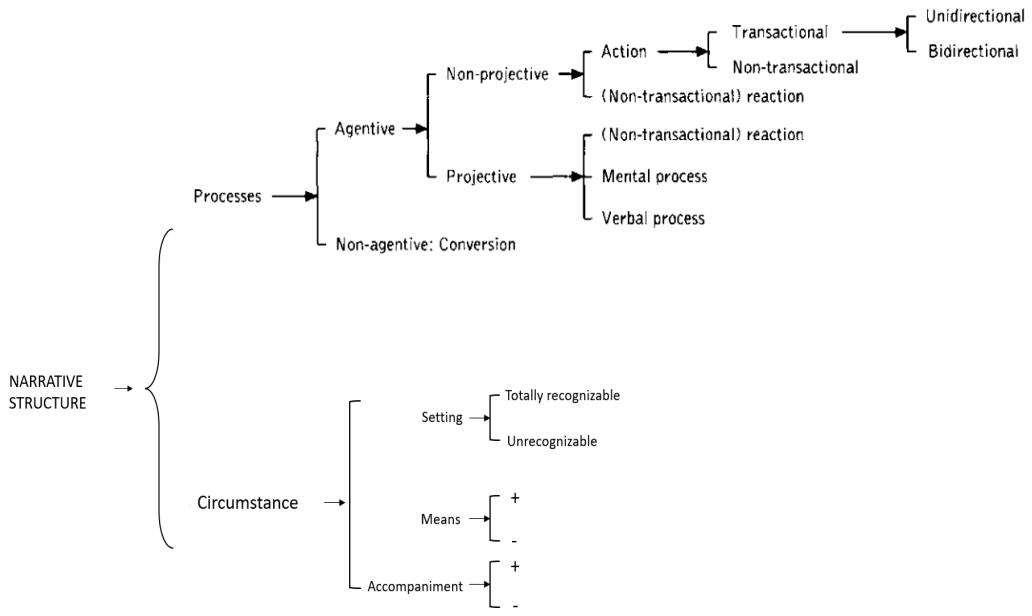
According to James Lush, Director of Lush Digital Media, five elements can make storytelling in marketing effective, there are Topical, Relevant, Unusual, Trouble, and Human (TRUTH). Topical means knowing what kind of information the audience needs at the moment. Relevant means creating storytelling that is relevant to a more specific target. Unusual means looking for a different point of view so that there is a surprise in the story. Trouble means showing conflict to keep the story interesting, and Human means showing humans in the story to make the audience feel the emotional connection with the characters (Agustina, 2020).

Methods

This study uses a qualitative approach through the multimodality method in social semiotics to understand the meaning of text in the media. The emergence of media technology developments has an impact on multimodal communication practices (Kress & van Leeuwen, 2020). Thus, the study on social media is very relevant if carried out with a method that can combine analytical tools in verbal and visual modes, which are defined as multimodal. Essentially, multimodal is defined as the use of several semiotic modes in a communication product, where verbal and visual modes in a semiotic event are used simultaneously. These modes are combined to strengthen, complement, or be in a certain communication practice arrangement (Kress & van Leeuwen, 2020). The targets in this study consist of content on platform X and also video content on the TikTok platform. Through multimodality, the writers do not study individuals or organizations, but rather products in the form of text. The writers can interpret the text to show the meaning behind the contents of the text (Jewitt, 2017). This approach seeks to recognize the agents of social actors and the social-power relations between them. In social semiotics, there are motivated signs where the relationship between the signified and the signifier is always motivated and is never arbitrary.

Furthermore, to analyze how the storytelling narrative in the conflict between Mie Gaga and Indomie developed on social media, the data used in this study were collected from social media content, especially from platforms X and TikTok. To determine which content to use, the writers based this study on the results of the Google Trends analysis where this case became the center of discussion among internet users from July to September 2023. This period is the basis for collecting social media accounts on platforms X and TikTok that actively discuss issues in the form of threads, memes, and videos. The writers then found the @senenjayamall account on platform X and @bigalphaid on the TikTok platform, which includes texts, images, and videos used in building storytelling marketing. The data was then analyzed through three structures: ideational, interpersonal, and textual or compositional. The analysis of each structure follows the structural model by Kress and van Leeuwen (2006).

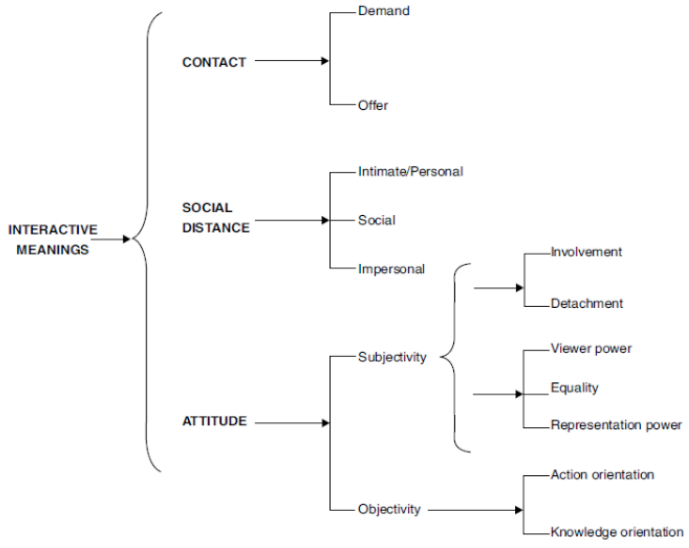
Figure 2
Narrative Structures in Visual Communication



Source: Kress and van Leeuwen (2006); Caple and Knox (2015)

The first is ideational structure, which in written language is realized in the language structure of transitivity or narrative structure. This structure realizes the meaning of experience, which consists of three aspects: process, participants, and circumstance. Process describes an activity carried out by an actor to achieve a goal. In written language, it is marked by a verb. While circumstance describes a condition or state. In written language, it is marked by the use of adjectives.

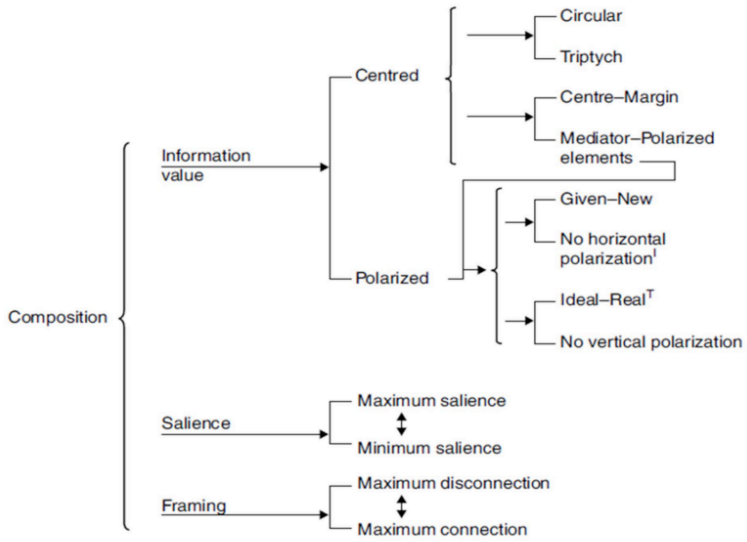
Figure 3
Interactive Meanings in Images



Source: Kress and van Leeuwen (2006)

Interpersonal is realized in the structure of mood. This metafunction is related to the relationship or interaction between participants. This structure is called interactive meaning. Interactive meaning is seen from three aspects, namely contact, social distance, and attitude.

Figure 4
The Meaning of Composition



Source: Kress and van Leeuwen (2006)

In the textual or composition stage, it is related to how the language we use is a linear symbol. This symbol has a beginning and ending that requires space and time to start and end it. Language is structured in such a way that it has meaning textually. Composition is analyzed through three elements, namely information value, salience (elements prominence in the composition), and framing. Eventually, the media text will be examined by first selecting components according to the mechanism of social semiotic analysis.

Results

The elements in the content that form the basis for the construction of the text in threads and video content show several modalities that are used simultaneously to create meaning regarding brand and competitor information for the audience. Both texts on X and TikTok content convey a story with a dramatic atmosphere that tells the story of a business partner's betrayal. On the other hand, some forms of product promotion from the victimized actor are embedded in the story.

In the first structure, the narrative structure is divided into two structures, which are process and circumstance. The process is a description of the actions done by the actors in the narrative story. While the circumstance is the atmosphere or condition associated with the actions taken by the actors. In the narrative structure, the contents posted on X and TikTok tell a conflict between two actors, which are Djaja (Djayadi Djaja, the owner of Mie Gaga) and Salim (Sudono Salim, the owner of Indomie). The conflict between them elaborates on the chronology of the rise of the Mie Gaga brand. It is depicted with a heated atmosphere as there is a party who is hurt. The main story is delivered using verbal narration, which is written and voice narration. This verbal narration not only explains the actions of the actors but also describes the atmosphere. The depiction of the atmosphere is formed by the choice of words. Words such as "disingkirkan (red: *removed*)," "terdepak (red: *kicked out),*" "rela

kehilangan anak kandung (red: *willing to lose biological child),*" and "tidak menyerah mengambil hak asuh (red: *not giving up taking custody)*" are used to describe what happened to one of the actors (Djaja, the owner of Mie Gaga). The choice of words suggests victimhood and hurt feelings on the part of one of the actors. Meanwhile, the visual elements use images in the form of memes and videos. Images and videos are used to emphasize the story conveyed through verbal narration, thus emphasizing the atmosphere of heated conflict and one of the actors who is hurt. Memes are used on social media X, depicting the atmosphere that appears in the main story. One of the memes can be seen in Figure 6.

The content spread on X and TikTok regarding the conflict between Mie Gaga and Indomie also contains important elements in storytelling marketing. In the developing narrative, five main components play a role in constructing an effective story, namely setting, characters, storyline, conflict, and message (Susilowati et al., 2024). The setting in this story is centered on the instant noodle industry in Indonesia, where business competition between big brands is the main context underlying the narrative. This conflict began to emerge in July to September 2023, when various content that raised the history of the founding of Mie Gaga and Djajadi Djaja's involvement in Indomie went viral. In this feud, the two main characters that stand out are Djajadi Djaja, who is portrayed as the party experiencing injustice, and Sudono Salim, who is portrayed as the party who "betrayed" his business partner. The use of diction in the content spread on social media strengthens the image of Djaja as a victim and builds sympathy from the audience. The storyline presented also follows a classic pattern, starting from the introduction of the background of the conflict, escalating into tension due to injustice, and eventually reaching a climax with the increasing popularity of Mie Gaga as a competitor to Indomie. This narrative not only aims to tell the business journey but also builds emotional attachment with the audience, making them feel involved in the story.

Conflict in storytelling is a crucial element that strengthens the appeal of the narrative. As stated by Kemp et al. (2021), conflict in storytelling functions as the main factor that makes the story more interesting and triggers audience involvement. In this case, the feud between two parties who once worked together in the instant noodle business is the main highlight, where the audience's emotions are triggered to side with one of the brands. With this conflict, the audience is not passive but also participates in discussions and the spread of stories through various social media platforms. In addition to conflict, the message contained in this storytelling also has a significant impact. The narrative that is constructed describes Mie Gaga as a product that was born from struggle and injustice but was able to survive and thrive. This message indirectly encourages the audience to sympathize with the brand and support it by buying its products.

Figure 5
Meme in Thread X

Source: X @senenjayamall (2024)

Figure 5 shows how Indomie hurts its partner, who is now the owner of Mie Gaga. The meme reinforces the narrative of "the founder of INDOMIE who is now being pushed out of the product he created himself." Meanwhile, on TikTok, the emphasis of the atmosphere is constructed by using video clips that are adjusted to the video narrative. For instance, a video clip of cooking Mie Gaga Extra Spicy in the narrative "… *akhirnya Djajadi Djaja terdepak dari Indomie…, (*red: *... finally Djajadi Djaja was kicked out of Indomie ...)*" depicts a heated conflict situation.

On the other hand, several visual elements clearly display images and videos of Mie Gaga products, such as in Figures 6 and 7. The Mie Gaga product images are displayed in close-up as well as information on various variants. These images clearly show the product variants owned by Mie Gaga.

Figure 6
Picture of Mie Gaga Products

Source: X @senenjayamall (2024)

Figure 7
Mie Gaga Product

Source: TikTok @bigalphaid (2024)

In the meaning structure, the narrative conveys information containing data, such as background and percentage of Indomie's share ownership. In addition, the sign maker also "asks" for attention from the sign recipient (reader) through questions written in several tweets. The attitude in the narrative conveyed gives the impression of equality, where the sign maker and reader have the same position. In addition to being equal, the reader is also considered to be involved in the narrative being told. The use of the term "we" and common knowledge such as in the sentence "*Pernah ada yang curiga ga kenapa MIE GAGA bisa seenak itu?* (red: *has anyone ever suspected why MIE GAGA can be so delicious?*)" also seems to make the sign maker communicate with the reader.

Meanwhile, in the composition structure, the information value in the narrative is conveyed in a centralized and polarized manner. In some images in the tweet, the information is centralized using product packaging images placed in the middle position. While the rest of the information is conveyed diffusely. In addition, the main information in the writing is conveyed with maximum salience, where the company name, company owner, and brand are written clearly. In addition, the information conveyed has a maximum connection with the main issue, which is the discussion about Indomie and Mie Gaga. However, in other tweets, the sign maker also creates a narrative with a framing that is not connected to the main issue, such as drawing lessons from the story being conveyed.

Discussion

Tweets and videos about Mie Gaga vs Indomie tell a story that features two actors with a complete storyline with a strong emotional nuance. Thus, the content can be said to be storytelling. Not only a story, but based on photos, videos, and several narratives, there are elements of product promotion in it. For this reason, it is appropriate to consider it as a form of storytelling marketing. The content of Mie Gaga vs Indomie not only displays the product and its benefits, but this storytelling style also tries to build relationships with the audience. One of them is by using the word "we" which shows an equal relationship and is on the same

side between the audience and the content creator. Moreover, it is also added with the use of sentences that seem to be common knowledge.

Building relationships with consumers is one of the important roles of a brand that can be brought up through storytelling (C et al., 2024; Roundy, 2014). It does not stop at relationships and engagement, storytelling can also influence consumer perceptions of the brand (Manoharan, 2024). Walter and Gioglio (2018) define brand storytelling as an art that shapes a company's identity through the use of narrative and storytelling techniques that facilitate emotional responses and build meaningful connections. This is shown by both tweets and video content that show the identity of a product, especially Mie Gaga product, which further strengthens the content creator's bias. This bias is directed towards Mie Gaga that is strengthened by the use of the narrative "Mie yang lahir dari pencipta Indomie (red: *Noodles that born from the creator of Indomie*)" which appears to be positioned as a victim. This supports the power of storytelling as an effective marketing tactic to generate emotional responses. Storytelling is also a tool that binds organizations with consumers through stories about facts, data, and ideas to communicate strategic and tactical messages in narrative form (Rodriguez, 2023). Storytelling has its own place in marketing activities, but real marketing lies in authentic storytelling, which uses principles that allow for emotional connection with customers and genuine empathy, while supported by data. Storytelling tends to convey rational messages wrapped in sincere emotions that communicate and resonate with customers (Moin, 2024).

The images presented in both contents are formed in such a way, using a selection of expressions and camera shots that can create strong emotions as if the text wants to talk about Mie Gaga's struggle to survive and even become quite popular in Indonesia. Emotions are built to bring the audience closer to the brand through storytelling. Emotions become a way in marketing as it is essential for the success of a marketing model (Miller, 2017). A company's identity can be expressed through emotional marketing (Kumar, 2023). Emotional marketing is a new approach in the world of marketing that creates a relationship between the company and its consumers, which is expected to be one of the main keys to stimulating consumers (Khuong, 2015).

Storytelling has the power to touch feelings and create a deeper experience than simply conveying facts or product information. Emotional stories are not only captivating and inspiring, but they also profoundly affect consumer psychology, making the message more memorable. Storytelling is a very powerful marketing tool. Through this method, brands can build strong emotional connections with audiences (Miller, 2017). Storytelling that is conveyed through emotions becomes a way for the audience who enjoys the text to later become consumers of Mie Gaga products. Products that are built through emotional involvement are able to defeat consumer logic that influences their purchasing interest, and emotions become a way for products to build brands (Yoon & Park, 2012). Emotion is one of the most prominent components that influences consumer attitudes towards a brand. Emotional marketing connects audiences with brands in a more personal and human way (Sharma et al., 2022).

Feud creates emotions for the audience, and even becomes a way in marketing to provide added value to the product. This is known as brand viraly. Brand viraly is utilized in marketing as a strong attraction for a product to increase its market competitiveness through consumer loyalty competition (Akpınar & Berger, 2017). Brands can include elements of "feud" by framing the competition between products, services, or figures to arouse emotions,

create intrigue, and spark conversation. This is what happened in the Mie Gaga vs Indomie controversy which indirectly became part of a modern marketing strategy that combines emotion and virality to bring brands closer to consumers. The audience is not only expected to be consumers of content or text but also to be consumers of the products in that content. It can be seen from the post-emergence of content that tells the journey of the formation of Mie Gaga, which then the review content circulated quite massively on social media. The content is also widely recreated by many accounts. This shows that storytelling by bringing the company's personal story is also able to build engagement with consumers. This is something new if we look at the form of storytelling in general, which is driven storytelling, philanthropic storytelling, customer-led storytelling, and immersive storytelling or visual storytelling (Lindawati, 2018).

The virality of this storytelling is also inseparable from the role of social media. Business actors use social media as a digital marketing communication medium. Various platforms are commonly used by business actors in carrying out digital marketing, including Facebook, Instagram, Twitter, TikTok, and YouTube, which are used as tools to inform all forms of messages and information. The social media content produced becomes a strength in contrast to conventional mass media (Rahastine & Wulandari, 2020). Social media content that is utilized by marketers is known as marketing content.

Content marketing is a very crucial strategy in today's digital world, where information is abundant and audience attention is divided (Wang & Chan-Olmsted, 2020). By creating content that is not only informative but also interesting and relevant, we can build a strong closeness with the audience. In this effort, several approaches can be taken to ensure that the content produced is able to attract attention and create a closer relationship with the audience (Lou & Xie, 2020). The case of the competition between Mie Gaga vs Indomie reflects an interesting dynamic in the world of content marketing and how narratives can build closeness with the audience. Mie Gaga, founded by Djajadi Djaja, a figure who was also involved in the creation of Indomie, is now trying to attract the attention of consumers. This kind of brand storytelling is still rare in Indonesia and certainly makes a very visible difference when compared to other brands with the same product line. Brands are striving to make their stories different from those of other local and international competitors in the market (Delgado-Ballester, 2020).

In this context, the use of strong storytelling becomes very relevant. The story of Djajadi's journey and the history of the two brands can create an emotional closeness with the audience, who are now starting to consider Mie Gaga as an alternative. In addition, visual elements and creative marketing campaigns also play an important role in attracting consumer attention. Interaction on social media, where netizens compare the taste of the two brands and share their experiences, creates space for the audience to be actively involved. This shows that quality and relevant content, as well as an approach that emphasizes personal narratives, can increase consumer engagement and loyalty. Thus, the case of Mie Gaga and Indomie is not only a debate about taste but also about how brands can build stronger relationships with audiences through effective content marketing strategies.

However, in the context of Mie Gaga vs Indomie, the content creator is not from the brand. This is what then becomes a dilemma whether this is a marketing strategy or not. If we look at the X and TikTok accounts that made the post, they are not personal accounts but information accounts, which raises the question of where the source of information for the story came from. On the other hand, buzzers are also often used for marketing to create a

word-of-mouth phenomenon, where they try to increase consumer awareness of a product or service. By utilizing social media platforms, buzzers can reach a wider audience and potentially influence public opinion (Santoso et al., 2023).

Buzzers are an interesting phenomenon that has become an integral part of the modern social media landscape. They play an important role in disseminating information, promoting products, and influencing public opinion. However, the existence of buzzers has also raised debates regarding their ethics and impact on society. There are several challenges and risks associated with buzzer marketing. One of them is the potential for spreading misinformation or manipulating public opinion. If buzzers are not careful in choosing the issues or products they promote, this can backfire on the business. In addition, the reputation of the buzzers itself can affect the image of the brand they promote if they are involved in a controversy, and the impact can be detrimental to all parties involved (Edström, 2018). Attributes affect their actual experience with a product or service, and the actual experience they gain will further strengthen the value they desire.

The storytelling phenomenon in the feud between Mie Gaga and Indomie has shown that the narrative is emotion-based and disseminated through social media channels which can have a significant economic impact. As a result, this virality and narrative caused a decline in the value of shares of PT Indofood CBP Sukses Makmur Tbk (ICBP), Indomie's parent company, resulting in a loss of around IDR 6.7 trillion, driven by investor selling action triggered by public reaction to this controversy (Taufani, 2023). In contrast, Mie Gaga experienced a real spike in demand after this narrative went viral. Many consumers felt an emotional urge to extend their support to Mie Gaga, who was considered a "victim of business betrayal", culminating in a tremendous increase in sales figures. Favorable judgment of Mie Gaga began to appear on various platforms including netizens' comments on Indomie vs Mie Gaga content on TikTok, strengthening the narrative that their product surpasses Indomie in terms of quality. Akpınar and Berger (2017) in their exploration of valuable virality, argued that virality derived from audience emotions can significantly increase consumer engagement and purchasing behavior.

The economic impact of this phenomenon is intrinsically linked to the audience's emotions and empathy generated by the narrative. The stories that develop on social media massively involve the psychological dimension of consumers, fostering emotional attachment to brands that are considered "injured parties." This is in line with the principles of emotional marketing, where Kumar (2023) explains that emotion-driven marketing strategies have a more significant impact on fostering customer loyalty compared to traditional marketing methodologies. Emotionally engaged consumers are more likely to show loyalty and are motivated to make purchases as a demonstration of support for brands they identify as "victims." Therefore, a strong and emotionally engaging narrative not only functions as a brand communication mechanism but is also capable of influencing public opinion, influencing investment decisions, and even changing consumer preferences.

Conclusion

The viral story between Mie Gaga and Indomie shows that emotional storytelling spread through social media can shape consumer perceptions and influence market behavior. Although the narrative is not an official marketing strategy from the company, the content is effective in building emotional closeness, increasing brand awareness, and encouraging purchases. This phenomenon confirms that storytelling can be a powerful marketing

communication tool, especially when packaged authentically and relevant to the audience's values. Even further, content with stories like this is also used by other brands. Dua Belibis sauce brand, for instance, has a similar narrative in the betrayal of a co-worker which eventually creates a new similar sauce brand (Ibrahim, 2023). This story appeared sometime after the story of Mie Gaga vs Indomie.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

We, the authors of this manuscript, declare that we have used Grammarly, an AI-based tool, to assist in checking and correcting aspects of grammar, spelling, and writing fluency. However, all ideas, analyses, conclusions, and recommendations in this manuscript result from the authors' independent thought and full control. The AI technology was used solely to improve the writing style and did not replace the intellectual role of the authors.

We also ensure that all AI technology usage in this writing process has been carefully supervised and edited to ensure the relevance and accuracy of the information presented. The authors take full responsibility for the quality and accuracy of the content in this manuscript.

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Implementation of Electronic Signatures on Notarial Deeds, to Reduce Disputes, to Create Legal Certainty

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Abstract

The process of transferring rights in notarial practice in Indonesia often experiences disputes, from all over disputed issues being handled Assembly Supervisor Notaries in West Java and Banten province in Indonesia, around 78% are related to the use of power of attorney in his actions, then for action, the good thing is done in a way directly by the authorized person with avoid implementation that uses power. To address the problem limitations, the deed can be done by adopting electronic signatures as an alternative solution. The implementation can be made with adjustments to the interpreted value from the applicable laws in Indonesia. The purpose of this article is to interpret the concept of adopting electronic signatures in notarial deeds. This article is legal research that uses a normative legal research method. Facing a Notary Public is a condition mandatory requirement that must be met holder's right to make an Authentic deed (Notary Deeds), in this situation, people who can't fulfill it often give power of attorney to people they trust for facing the notary, but it turns out matter this often become root problem, then done signing deed Notary Public with adopt electronic signature However with constant standardization ensure fulfillment condition formal facing. All Notary Publics must adopt the concept that is not explicitly mentioned in regulations, but must be translated clearly and concisely so that its purpose and objectives can be translated into concrete actions, making the adoption of technology an inevitability that can be implemented to make legal certainty.

Keywords: electronic signature, notary deeds, legal certainty

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Introduction

In Indonesia, notarial deeds must be signed by the parties in front of a notary. This rule is clearly stated in Article 16, paragraph (1), letter m of Law No. 2 of 2014 on the Position of Notary (Indonesia, 2014). However, in many cases, one of the parties is unable to appear in person. Usually, they give power of attorney to someone else to represent them. Unfortunately, this often leads to legal disputes and issues with the validity of the deed.

At the same time, technology is changing how legal services work. Electronic signatures (e-signatures) are widely used in many sectors. But in the current law, specifically Article 5 paragraph (4) of Law No. 1 of 2024 on the Electronic Information and Transactions (ITE) Law (Indonesia, 2024), notarial deeds are excluded from using e-signatures.

This study offers a possible solution: collaboration between two notaries. One is the primary notary, who creates the deed. The other is the local notary, who helps the party in another region sign the document electronically. This method still respects the notarial process and keeps the deed authentic.

The purpose of this article is to provide an alternative solution for implementing the use of electronic signatures in notarial deeds with the concept of multiple notaries in one deed where one notary acts as the primary notary who makes the minutes and one or more other notaries act as verifiers of the electronic signature where each party will face each notary to fill in their agreement in the deed made by the primary notary. This can be in line with the concept of making notarial deeds in Indonesia with a fairly high possibility of implementation. This concept was created from the understanding of the author, who also works as a notary.

Literature Review

The Nature of Notarial Deeds

A notary is a public official appointed by the government to perform various legal actions, including the making of authentic deeds. According to Law Number 2 of 2014 concerning the Position of Notary, a notary is “a public official who is given the authority to make authentic deeds and has the function of providing legal certainty.” In carrying out their duties, notaries must comply with the applicable code of ethics and regulations, as well as maintain their independence and integrity (Indonesia, 2014). Notarial deeds have perfect evidentiary power (Budiono, 2012). A notarial deed is an official document made by a notary and signed by the parties involved in an agreement or transaction. This deed has high legal force and can be used as perfect evidence in court. According to Article 1868 of the Civil Code (KUHPer) (Subekti, 2014), a notarial deed is considered an authentic deed, which means that the contents of the deed are considered true and cannot be disputed by a third party. The process of making a notarial deed begins with a consultation between the notary and the client. The notary will explain the requirements and assist the client in preparing the necessary documents. After all the requirements are met, the notary will make a deed containing important information regarding the transaction. After that, the deed will be signed by all parties involved and witnessed by the notary.

The main function of a notarial deed is to provide legal certainty and protect the rights of the parties. For example, in a transaction to buy and sell shares in a company, a notarial deed will

include all the terms and conditions agreed upon by the seller and buyer. With a notarial deed, both parties can feel safe because the ownership rights to the shares are legally guaranteed.

Essence of Acceptance

Contract law regulates the legal relationship between two or more parties, where one party (creditor) has the right to demand something from another party (debtor), and the debtor is obliged to fulfill the demand. Contracts can arise from agreements (contracts) or laws (for example, unlawful acts or non-obligatory payments).

Agreement (consensus/overeenstemming) is one of the requirements for the validity of a contract based on Article 1320 of the Civil Code (KUHPerdata). Without agreement, a contract can be canceled (Subekti, 2014).

Agreements are formed from the Offer and Acceptance process, where in this case one party and the other may accept, bargain or reject it so that the will of both parties (Meeting of Minds) is met, where they must understand each other about the Object of the agreement, Rights and obligations of each. In general, the Validity Requirements for an Agreement based on Article 1320 of the Civil Code, an agreement is valid if:

- The agreement is free from defects (no coercion/fraud).
- The competence of the parties (adult & sane).
- Certain objects (goods/services agreed upon are clear).
- A lawful cause (the purpose does not violate the law).

This agreement is in the form of: Oral (Valid as long as it can be proven), Written (More legally secure, like a notary deed and contract), and Electronic (recognized by the Electronic Information and Transaction Law) (Budiono, 2012).

The agreement (consensus) that is made can be implemented digitally, which can be formed through a digital platform, such as a website, application, email, or digital signature. This concept is legally recognized in Indonesia through the Electronic Information and Transactions Law (UU ITE) and the Civil Code (Indonesia, 2008), it turns out that notarial deeds are excluded from these regulations.

In 2024, changes were passed to the ITE Law in Indonesia, which began to open up opportunities for the application of electronic signatures in Indonesia for Notarial Deeds because the exceptions as previously stated were eliminated.

This study sees that the opportunity to apply electronic signatures to notarial deeds is increasingly open and increasingly possible to be applied so that this study will ensure that the process can be carried out while still ensuring that the doctrine and regulations applicable to notaries can still be implemented by minimizing friction in their regulations. So we offer a signing concept that adopts a digital signature in a notarial deed which at the same time changes the doctrine that makes digital deeds or minutes of deeds recognized as powerful.

Recognition of this digital notarial deed is very important because in addition to paving the way for the implementation of digitalization for notaries, it is also a solution to the problem of distance and time for an act that has a special situation that is more credible than the granting of power of attorney and the process that is gone through in electronic authentication in the use of electronic signatures will also increase security in the process of making deeds. Based on

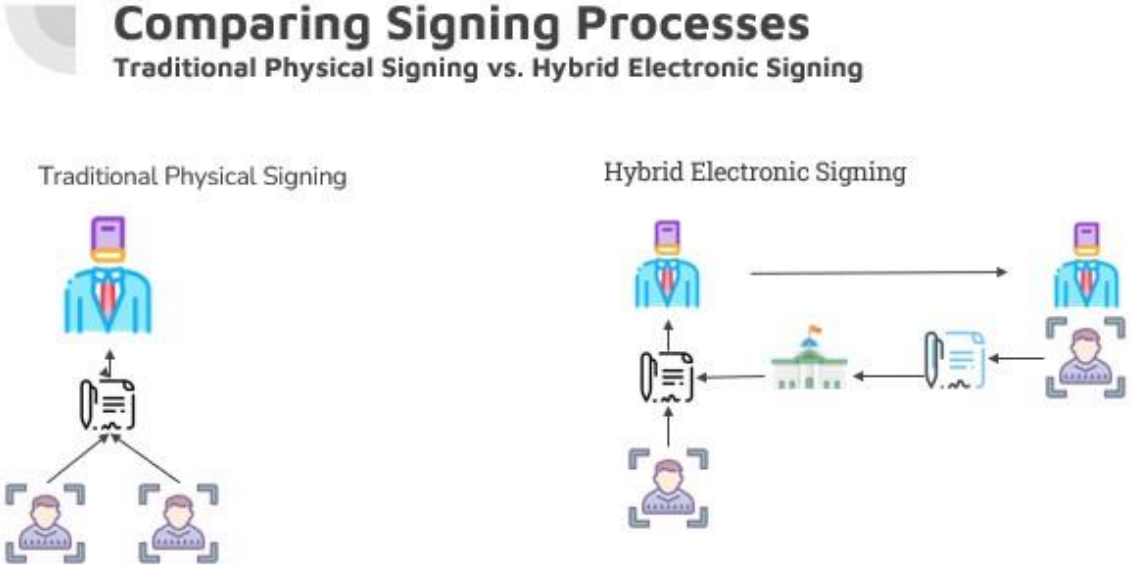
the results of the study data that I conducted in my dissertation research, 78% of the existing problems are problems concerning the granting of power of attorney for a legal act and this should be anticipated immediately so that it does not happen again in the future.

Methodologists

This study uses a normative legal method with a qualitative approach. Data were collected through an in-depth literature review of relevant laws and regulations, official documents, and academic literature related to notarial deeds. In addition, interviews with notary practitioners were also conducted to gain practical perspectives on the challenges and best practices in making notarial deeds.

Result and Discussion

Figure 1
Comparison Between the Use of Wet Signatures in the Traditional Physical Signature Concept and the Hybrid Electronic Signature Concept



The process that has changed in this case is that previously to make a deed, all parties had to appear before a notary and this was very inefficient because if the parties were scattered and lived in distant places, this would take a lot of time and energy as well as resources so that it was very inefficient in terms of time, economy and social so that the author based on the research conducted if electronic signatures can be applied in notarial deeds, then making deeds with a hybrid concept can be a superior solution.

Ensuring that legal acts are carried out perfectly is a task that must be carried out by a professional notary, but making it difficult for users of notary services is certainly not a good choice in carrying out this professionalism, so if electronic deeds can have the same power as conventional deeds (printed deeds) then this is a breakthrough that will make things very easy and still maintain the dignity and function of the notary's position perfectly.

So, as illustrated in the diagram, a person who wants to provide an agreement through an electronic signature only needs to come to appear before a notary where he is and no longer

needs to come to a notary who is far away from him, so in this case it will save time, travel accommodation costs and even minimize the risks that may arise from this act.

So we can simply describe this concept as follows: Traditionally, the notary drafts the deed and all parties must be physically present for reading and signing. If any party is absent or fails to read the deed, the document may be rendered invalid or downgraded to a private deed. In contrast, the collaborative model involves a primary notary who drafts the deed and a local notary who facilitates the party's appearance and electronic signing. The local notary verifies identity, ensures understanding of the document, and oversees the placement of the certified e-signature. Both notaries ensure all legal steps are fulfilled.

Table 1
Comparison Table to Show, the Traditional Deed Making Concept and the Digital Collaborative Concept (With More Than One Notary)

Step	Traditional (One Notary)	Collaborative Digital (Two Notaries)
Deed Preparation	Written by one notary	Written by primary notary
Party Appearance	All parties appear at the notary's office	Each party appears at a local notary office
Reading of Deed	Read aloud by the notary	Read remotely or waived with agreement
Signature	Wet ink signature	Certified electronic signature
Notary Legalization	Signed and sealed by primary notary	Signed by primary and/or local notary
Legal Status	Fully authentic deed	Still authentic under Notary Law

In this case there may be many questions that arise why this concept needs to be done?, this is because there is a problem that has been going on for a long time in the world of notaries in Indonesia where there is an obligation that must be carried out by notaries to be careful and precise, so that the concept of facing a notary becomes something very important and the author agrees not to eliminate this in the concept of cyber notaries which may be adopted in the notary system in Indonesia, therefore the concept of this hybrid electronic signature is something superior because it does not kill the doctrine that has long existed and lives in society but also ensures that the main concern remains in place, it's just that this will be able to be implemented if the laws and regulations have legitimized that digital deeds have the same power as printed deeds which have been a traditional concept (Sutaryo, 2017).

The equality of digital deeds has the same power as printed deeds is Legal Certainty. If the legal force of a digital deed cannot be the same as a printed deed, then it means that a notary cannot apply the concept of cybernotary because the gateway to cybernotary is by recognizing the existence of a digital deed, which of course, will result in creating legal uncertainty. According to the progressive Indonesian legal figure Prof. Satjipto Rahardjo, good law must be fair, useful, and certain (Raharjo, 2012).

Conclusion

The implementation of the signing of a deed collaboratively in the notary system allows a deed in digital form to be signed by the parties facing the notary, where this signing will ensure that every function of the notary's office is maintained properly, making every process perfect. Where a primary notary issues minutes, while other notaries act as digital signature verifiers who use the concept of legalization, namely, validating signatures in digital form.

This collaborative system allows people to sign notarial deeds electronically without losing the legal strength of the document. It also solves the problem of using a power of attorney, which is often abused.

For this model to work well, Indonesian law needs to be updated. Especially, the ITE Law must allow notarial deeds to use electronic signatures under certain conditions. If this happens, notaries can provide better, safer, and more modern legal services while still protecting the authenticity and legal certainty of each deed.

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Investigation of Knowledge Transfer in International R&D and Procurement for Japan's National Security Cooperation

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Abstract

Japan's defense aims to maintain a free and open international order while addressing diverse security challenges. Accordingly, international cooperation is essential in research and development (R&D) and procurement projects related to national security to strengthen strategic partnerships. The successful execution of these projects requires sophisticated information management concerning international negotiations and defense equipment, and specialized know-how and expertise. However, much of this critical knowledge remains tacit, embedded in the experiences of seasoned professionals, hindering its transfer. To address this issue, methodologies such as the SECI process and knowledge structuring have been proposed to facilitate the conversion of tacit knowledge into explicit knowledge. Additionally, research on knowledge transfer in corporate R&D project management highlights the importance of sharing "*ba*" (which roughly means "place"), as the shared context for knowledge creation. Despite these advancements, frequent personnel rotations and temporal-spatial gaps between projects hinder direct knowledge sharing through on-the-job training (OJT). While the U.S. utilizes personnel exchanges for knowledge transfer, Japan faces significant difficulties due to differences in organizational culture and structures, leaving temporal and spatial gaps unresolved. This study examines the sociological dimensions of knowledge transfer in Japan's international security cooperation. By analyzing organizational structures and institutional cultures, it identifies key factors influencing expertise retention. Through case studies and stakeholder interviews, critical knowledge is systematically organized into a dynamic transferable framework using knowledge engineering methodologies. These insights contribute to practical methods for sustaining knowledge in these national security projects. They also offer methodologies applicable to situations where direct knowledge transfer is difficult.

Keywords: national security cooperation, international R&D procurement, knowledge transfer, knowledge structuring, hybrid knowledge graph

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Introduction

Background and Problem Statement

The global security environment has undergone a substantial transformation, particularly following the outbreak of the Russia–Ukraine conflict. In response, Japan issued a new National Security Strategy, National Defense Strategy, and Defense Buildup Program in December 2022 (Ministry of Defense, 2024). One of the critical challenges emerging in this new era is the escalation of costs and delays in defense-related research and development (R&D) and procurement. These difficulties have made it increasingly difficult for Japan to independently execute major defense projects, thereby accelerating the need for international cooperation.

In light of this strategic shift, Japan is actively promoting international R&D and procurement to strengthen strategic partnerships and ensure interoperability with allied nations. This effort involves the introduction of cutting-edge technologies while mitigating risks and containing costs. Effective implementation demands advanced information management and deep domain expertise. Japan's approach encompasses four main models: International Joint R&D, Sample Purchase R&D, Direct Commercial Sales (DCS), and Foreign Military Sales (Defense Security Cooperation Agency, 2025). Among these, this study focuses on the Foreign Military Sales (FMS) model, which revealed extensive tacit knowledge (Polanyi, 1967) and know-how embedded in past procurement cases. Despite the growing importance of international cooperation, Japan continues to face persistent barriers in knowledge transfer. These include the protection of sensitive information, procedural complexity, and lack of documentation, all of which hinder effective knowledge retention and transfer.

Purpose of the Study

The primary objective of this study is to overcome challenges in knowledge transfer related to international R&D and procurement for Japan's national security cooperation. These challenges include disruptions caused by frequent personnel rotations and temporal-spatial gaps between projects.

To address these issues, the study first analyzes key problem statements and identifies the sociological factors that hinder effective knowledge transfer. These include tacit and fragmented forms of expert knowledge, the lack of structured knowledge transfer systems, and cultural or institutional barriers that arise within multinational cooperative frameworks. Building on these insights, the study then applies a structured knowledge engineering approach to capture and organize expert knowledge in a reusable and transferable format. This approach supports the conversion of tacit, experience-based knowledge into explicit, shareable forms, enabling effective transfer even during personnel changes. This approach contributes to both practical implementation and theoretical advancement in international defense cooperation.

Literature Review

Previous studies have highlighted the inherent complexity of transferring tacit knowledge within organizations (Szulanski, 2000). To address this challenge, the SECI model conceptualizes knowledge creation and transfer as a dynamic interaction between tacit and explicit knowledge (Nonaka & Takeuchi, 1995). Furthermore, the concept of "*ba*"—a shared

context for knowledge creation—facilitates this process by providing a relational space that supports knowledge generation and transfer (Nonaka et al., 2000). In recent years, knowledge structuring engineering has been applied to formalize expert insights and promote cross-domain reuse. This methodology has demonstrated effectiveness in fields such as education and eldercare, where it supports the articulation of critical know-how and its conversion into machine-readable formats for integration with artificial intelligence tools (Iino et al., 2019; Ijuin et al., 2022; Nishimura et al., 2018). These examples offer practical foundations for applying the method to defense-related domains, including international R&D and procurement.

Research Methods

In this study, we implemented a two-part methodology based on initial semi-structured interviews with 20 current and former practitioners from relevant agencies and domains. The first part involved an analysis of the current status assessment, while the second part applied the knowledge structuring method in detail.

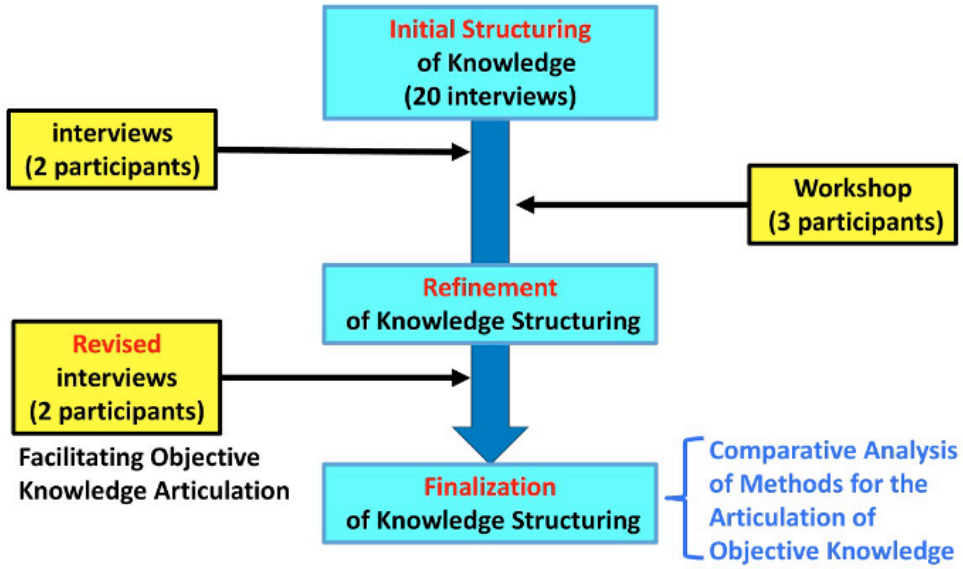
Current Status Assessment

First, we conducted a Current Status Assessment through interviews to identify key sociological factors hindering effective knowledge transfer. These included tacit and fragmented expert knowledge, lack of structured transfer mechanisms, and institutional or cultural barriers within cooperative frameworks.

Knowledge Structuring Process

Building on these insights, we applied a method called Knowledge Structuring. This process was developed based on previous methodologies (Nishimura et al., 2013, 2018). The objective was to externalize both work procedure and objective knowledge held by experts and to integrate them into a transferable framework—the Hybrid Knowledge Graph (Ijuin et al., 2022). The detailed procedure is illustrated in Figure 1.

Figure 1
Detailed Procedure for Knowledge Structuring



We began with the initial structuring of knowledge, based on 20 interviews, to extract both work procedure and objective knowledge. The resulting outputs were then validated through a second round of interviews with two expert participants. In addition, a workshop involving three participants was conducted to further refine the knowledge structuring process. Despite these efforts, the articulation of objective knowledge remained challenging due to its deeply embedded nature. To address this issue, revised interviews were conducted with two experts, specifically aimed at facilitating the articulation of objective knowledge. This process was followed by a comparative analysis of methods for facilitating the articulation of objective knowledge.

Research Results

Current Status Assessment

First, the absence of formal manuals and the limited accumulation of explicit research knowledge present significant barriers to systematic knowledge sharing.

Second, much of the relevant knowledge remains tacit, owing to the domestic-centric nature of projects and constraints arising from regulatory and security considerations.

Third, frequent personnel rotations—typically every two to three years—and long intervals between projects—often spanning five to six years—create spatial and temporal discontinuities. These gaps make it difficult to ensure continuity through on-the-job training (OJT), often resulting in repeated procedural errors.

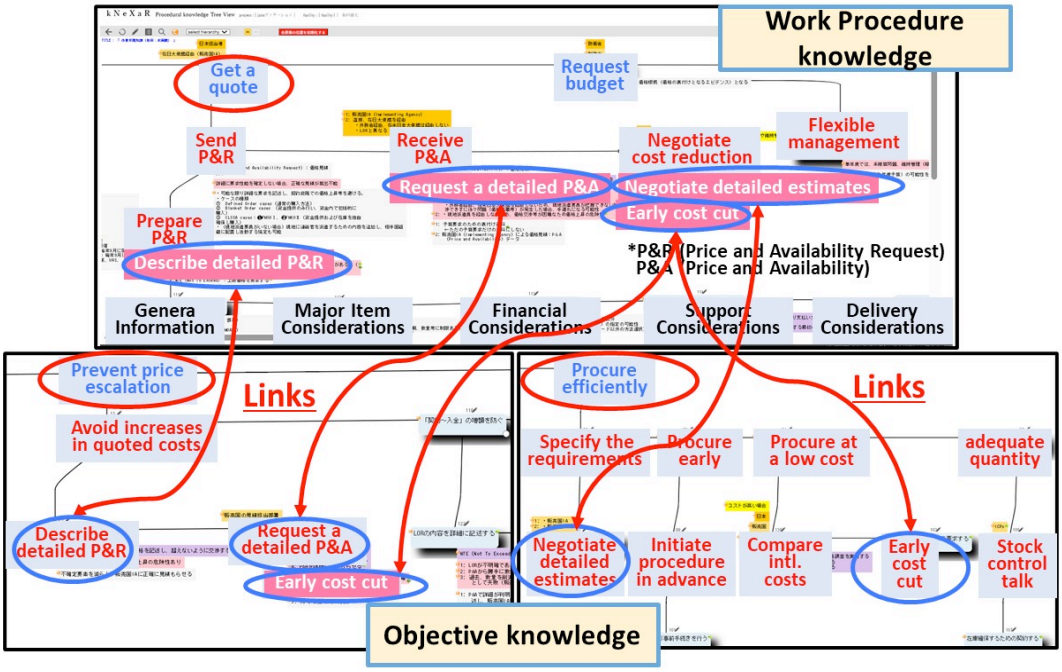
Lastly, Japan's knowledge transfer systems lack the structural integration seen in countries such as the United States. In the U.S., institutionalized personnel exchanges are routinely conducted across the military, the defense industry, think tanks, and Congress. In contrast, Japan continues to face cultural and organizational barriers that inhibit such cross-sectoral knowledge flow.

Knowledge Structuring Process

This study applied a structured methodology to the FMS procurement process to organize and externalize expert knowledge. An example of the resulting output is presented in Figure 2. Based on interview data, we employed a purpose-driven procedural modeling approach (Nishimura et al., 2013), in which each procedure was hierarchically decomposed to ensure both clarity and reusability. All nodes in the graph are represented in a consistent "verb + noun" format, with detailed metadata describing the actor, operational context, implementation method, and relevant precautionary notes.

The model integrates two types of knowledge: work procedure knowledge, which captures concrete tasks and processes, and objective knowledge, which represents the intentions and rationale underlying those actions. By linking these two layers, we constructed a Hybrid Knowledge Graph that supports both transferability and reusability. Some tasks are associated with a single objective, while others correspond to multiple objectives. This complementary structure enables the representation of not only what is done, but also why it is done, facilitating a more comprehensive and omission-free capture of expert knowledge. The results demonstrate that this structuring method is effective in visualizing, transferring, and reusing tacit knowledge, even in complex domains such as international procurement.

Figure 2
An Example of Hybrid Knowledge Graph



Conclusion

This study investigated the challenges of knowledge transfer in international R&D and procurement related to Japan's national security cooperation. Through interviews and workshops with experts, we identified key sociological and organizational barriers—such as tacit and fragmented expert knowledge, lack of structured transfer systems, and spatial-temporal discontinuities caused by personnel rotations and project intervals. To address these challenges, we applied a structured knowledge engineering approach, integrating work procedure knowledge and objective knowledge into a reusable and transferable Hybrid Knowledge Graph. This study contributes to bridging the knowledge gap in multinational defense cooperation through a novel and applicable methodology.

Academic Contributions

This research makes several academic contributions. First, it proposes a structured framework for knowledge transfer in international defense R&D and procurement. Second, it demonstrates the practical application and validation of the Hybrid Knowledge Graph in a national-level defense project. Third, it addresses the challenge of articulating objective knowledge and presents effective methods to facilitate its externalization based on comparative analysis.

Practical Contributions

From a practical standpoint, the study identified implicit bottlenecks in Japan's FMS processes and visualized undocumented procedures and rationales. This enabled the development of a reusable knowledge structuring method, which holds potential for application across other government agencies and international cooperation frameworks.

Future Work

Future research will first focus on developing and evaluating new methods to facilitate the articulation of objective knowledge, building upon the comparative analysis conducted in this study. In parallel, we will explore the integration of generative AI to accelerate and optimize the knowledge structuring process. We also plan to further apply the SECI model and the concept of *ba* (Nonaka et al., 2000) to mitigate knowledge discontinuities arising from personnel rotations and project intervals. Finally, we aim to enhance sustainability by embedding structured knowledge into daily operational practices, thereby ensuring its continued use and refinement in real-world settings.

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Issues and Factors for External Human Resources With Careers in the Security Area in Providing Educational Support As Instructors

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Abstract

As the international security environment becomes more severe, teachers in secondary education demand more educational support from external human resources as instructors. However, in reality, external human resources with careers in the security area as instructors are not ideally utilized, because of differences in perceptions of security between teachers and instructors. Some literatures indicate that barriers to teachers' approaching and communicating with external human resources are major factors in these issues. On the other hand, issues concerning external human resources have not been investigated because it strongly depends on the characteristics of practical knowledge and the expertise of the instructors. The objective of this research is to find out the challenges that are faced by external human resources by conducting a survey specifically in the security area. In addition to previous research on teachers' approaches, this research on external human resources' approaches to teachers is also important for finding out the ideal relationship between teachers and external human resources. The purpose of this study is to reveal the issues and factors when external human resources with careers in the security area provide educational support in secondary education as instructors. In this study, we conducted semi-structured interviews with five external human resources with careers in the security area. The results indicate that the following major issues hinder the collaborative relationship: conflict in mutual understanding in security education and peace education, and lack of recognition about educational roles of external human resources with careers in the security area as dialogue partners.

Keywords: external human resources with careers in the security area, dialogue partner, collaborative relationship, security education

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Introduction

In secondary education, in order to cultivate students' abilities to solve societal challenges, teachers actively utilize External Human Resources (hereinafter referred to as EHR) as instructors, guest speakers with practical knowledge outside of schools (Ministry of Education, Culture, Sports, Science and Technology, Japan, 2022). For example, teachers utilize police officers in safety education (Table 1). In addition, they utilize Hibakusha or war victims in peace education regarding atomic bomb tragedy in Hiroshima and Nagasaki or horror of the Battle of Okinawa (Nojima, 2016).

Table 1
Status of Utilization of External Human Resources

Instructors (Practitioners)	Educational support contents	Subjects in secondary education
Police officers, Corporate engineers	Safety education	Social studies
Hibakusha, War victims	Peace education: ✓ Atomic bomb Tragedy in Hiroshima and Nagasaki ✓ Horror of the Battle of Okinawa	Civics
Foreigners	Education for International Understanding	Foreign language
Financial planners	Financial education	Technology & Home economics

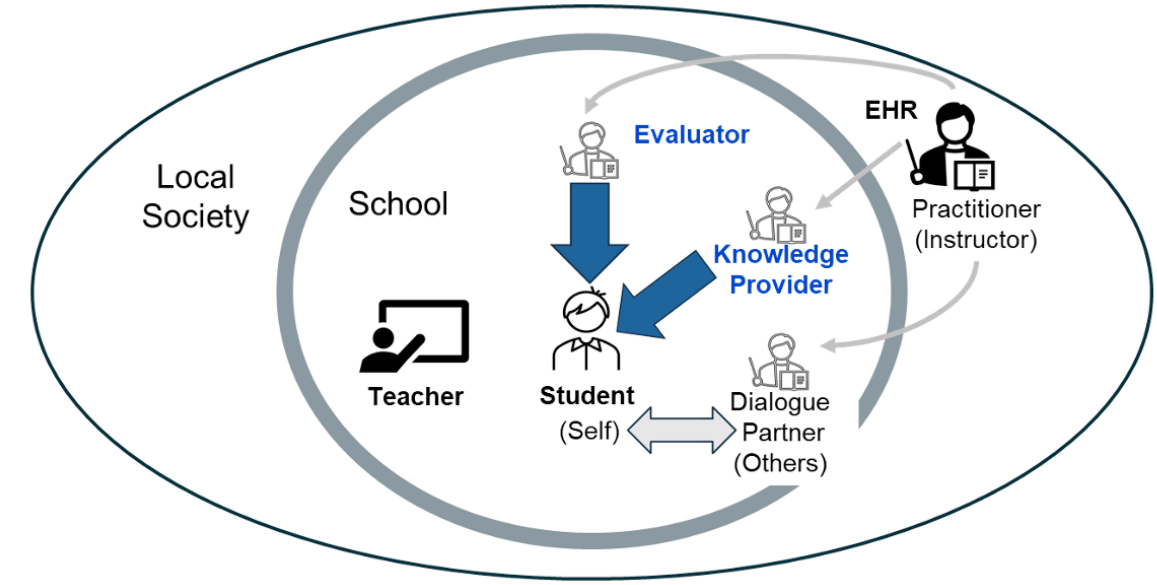
When utilizing EHR, Hayasaka (2008) argues that it is important to have learning activities that aim to solve societal challenges through collaboration between teachers with school knowledge and EHR with practical knowledge. However, EHR with security knowledge are underutilized compared to EHR with other specialized knowledge (hereinafter referred to as general EHR). Therefore, the purpose of this study is to find out the issues and factors hindering the utilization of EHR with careers in the security area.

Literature Review

Based on previous research (Karaki, 2008; Konishi, 1994) considering the educational role of practitioners as EHR in learning activities, EHR can play three roles in providing educational support that transcend the boundary between society and schools. Firstly, the role as an instructor providing knowledge is clearly recognized. The second role is an evaluator who assesses students. According to Konishi (1994), this refers to a vertical relationship in which EHR evaluates students' involvement in solving societal challenges. Thirdly, for student as "self", EHR also plays the role of dialogue partner as others in society. According to Karaki (2008), it refers to horizontal and collaborative relationship in which students deepen their understanding others' thought through dialogue and learn how to engage with societal challenges.

In response to these Konishi and Karaki's arguments, Inoue (2021) focuses on the role of the teacher. Inoue conducted a survey of students' awareness of safety education in the local society to clarify the role of teachers. As a result, students who were unable to find ways to engage with local societal challenges tended to view EHR as an evaluator and knowledge provider, being formed vertical relationship. This survey results are shown in the figure (Figure 1), which indicates that students feel stronger vertical relationship than horizontal relationship. These formed an imbalance, which is represented by the size and color of the arrows. Vertical relationship is a natural perception for student, so it is necessary to encourage building horizontal and collaborative relationship for resolving imbalance.

Figure 1
Imbalance Between the Three Roles of EHR



Inoue concludes that to resolve this imbalance, the role of teacher is to create learning spaces that encourage dialogue to strengthen collaborative relationship. To that end, Inoue also argues that communication with EHR is necessary to have mutual understanding of the abilities that should be cultivated in students.

So far, we have explained about general EHR. From here on, we will consider about EHR with careers in the security area (hereinafter referred to as CSA). As the international security environment becomes more severe, teachers in secondary education utilize EHR with CSA, because there is a gradually growing demand for educational support with knowledge of recent international affairs, conflicts, wars, and disasters. The occupations of EHR with CSA who provide educational support include self-defense forces personnel, diplomats, and university professors (Table 2). In their daily practical work, they conduct national security education (war and conflict avoidance), international security education (conflict resolution), comprehensive security education (understanding others), and so on. When EHR with CSA are requested by teachers to provide educational support, they conduct peacekeeping education, peacebuilding education, comprehensive peace education (Reardon, 1988), and so on in secondary education.

Table 2
Status of Educational Support Provided by EHR With CSA

EHR/CSA's occupation	Security education content in practical work	Educational support in secondary education
Self-Defense Forces personnel, United Nations staff	National security education (War & Conflict avoidance), Leadership	Peacekeeping education, Disaster prevention education
Diplomat, International organization staff	International security education (Conflict resolution)	Peacebuilding education, International cooperation education
University professor (Instructor with CSA: former Self-Defense Forces personnel & Diplomat)	Comprehensive security education (Understanding others, Intercultural understanding)	Comprehensive peace education (Conflict resolution education, etc.), International understanding education

In reality, EHR with CSA are not ideally utilized compared to general EHR, despite being in times of conflict. Based on previous research (Nojima, 2016), the issues facing teachers in secondary education are as follows. Most teachers recognize that EHR with CSA are not necessary because they conduct peace education supported by general EHR. Therefore, teachers are not actively approaching EHR with CSA, and they do not utilize EHR with CSA very much compared to general EHR.

Based on these backgrounds, research questions of this study are:

- What are the issues and factors hindering utilization of EHR with CSA?
- What is the difference between general EHR & EHR with CSA?
- What are the issues about the educational role of EHR with CSA and communication?

Research Methods

In this study, we conducted semi-structured interviews with five EHRs with CSA (Table 3). Profiles of five interviewees: former self-defense personnel and diplomats or current United Nations staff, four men and woman, 40s to 60s, and current positions are university professors respectively. All of them provide educational support based on their security knowledge, for example, human security, economic security and self-security to cultivate understanding others. Their educational supports in secondary education are: societal security education, comprehensive peace education (international understanding), intercultural education, comprehensive peace education (understanding others, conflict resolution) and so on. We questioned issues in providing educational support as EHR with CSA. This semi-structured interview consists of 20 questions in 5 categories. Each interviewee was interviewed for 90 minutes.

Table 3
Profiles of Five Interviewees

EHR	CSA	Age	Current occupation	Security knowledge	Educational support in secondary education
Mr. A	Former Self-Defense personnel	50s	University Professor	Homeland security (Defense)	Societal security education (Disaster prevention education)
Ms. B	Former Diplomat	40s	University Professor	Human security (Human rights, Humanitarian assistance, Reconciliation)	Comprehensive Peace Education (International Understanding, Conflict Resolution, Peacebuilding, International Contribution,)
Mr. C	Former Self-Defense personnel	50s	University Lecturer	Security of knowledge and technology	Intercultural Education
Mr. D	Former Self-Defense personnel & Diplomat	60s	University Professor	Economic security, International politics	Comprehensive Peace Education (International Understanding, International Cooperation)
Mr. E	Former Self-Defense personnel & Diplomat	60s	UN Staff, University Professor	Self-security (Understanding others, Intelligence, Disarmament)	Comprehensive Peace Education (Understanding others, Conflict Resolution, Conflict avoidance, International Cooperation)

Results and Discussion

We were able to obtain many valuable data and insights from this interview survey. We will discuss the issues and factors on the following two points, focusing on the most important data relevant to our hypothesis. One of Survey results about roles and relationship as follows. Questions are, for example, “What is your educational role as EHR with CSA” or “How the relationship among teachers, students and you should be?” The insightful responses to these questions are as follows.

> In order to cultivate students' security knowledge, I think we need a ‘train the trainer’ program where EHR with CSA teach teachers. (One more interviewee similar response)
>
> I think both students and teachers should recognize that they lack security knowledge and should learn more actively from us. (Two more interviewees similar responses)

Issues & Factors revealed from the interviews are as follows. Security education tends to be knowledge-providing education, which strengthens vertical relationship and weakens horizontal and collaborative relationship that encourages dialogue between students and EHR with CSA.

Another survey results in communication as follows. Question is “Please tell us about issues in communication with teachers in educational support.” The typical responses to this question are as follows.

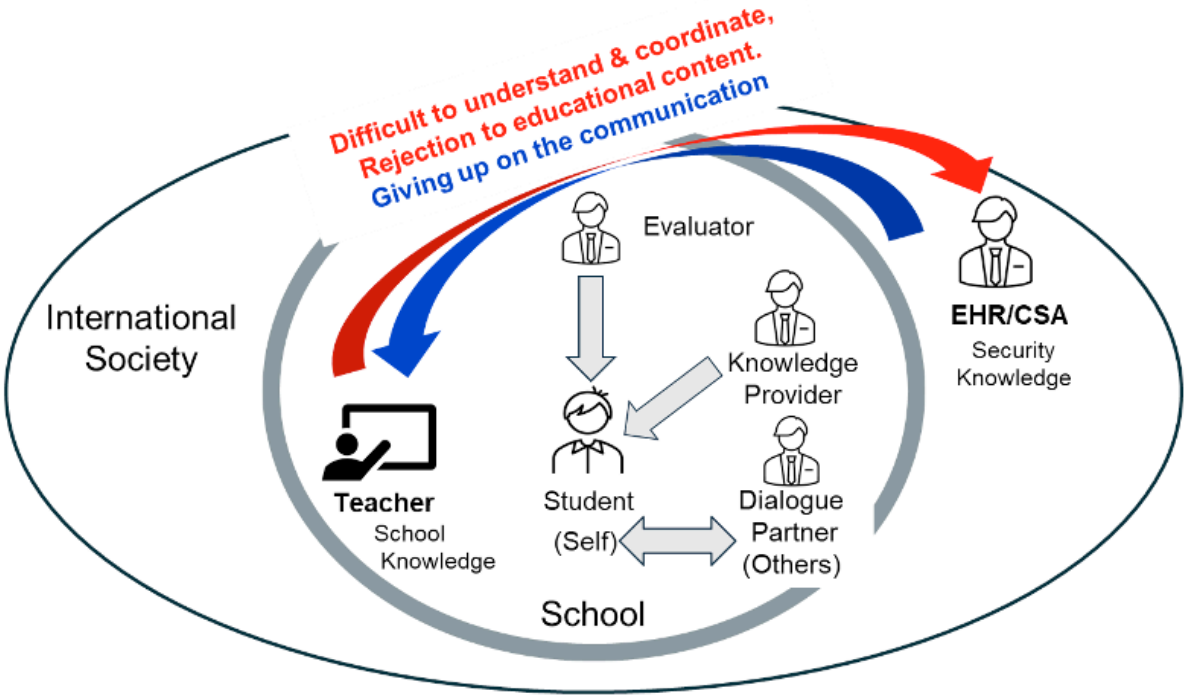
> Teachers are not interested in security education and are passive, so I don't think I will try to communicate with them in advance. (Two more interviewees similar responses)
>
> Since security evokes images of military and war, teachers show their rejection and aversion to security, so I have no choice but to avoid using the term ‘security’ in my teaching. I have not shared my recognition of this matter in advance. (All five interviewees gave similar responses)

Issues and Factors revealed from the interviews are as follows. EHR with CSA have given up on communicating with teachers due to a distrust of teachers' indifference and passive learning attitudes, as well as discouragement at teachers' rejection and avoidance.

Based on these results we summarize differences in communication between general EHR and EHR with CSA. In the case of safety education provided by general EHR, for teachers, safety education is an extension of social studies, so it is easy to understand and coordinate with general EHR, and acceptable educational content. Therefore, they can relatively easily build collaborative relationship on a regular basis. On the other hand, security education is highly specialized and difficult for teachers to understand. In addition, there is teachers’ rejection to security education content, which makes giving up on communication, as revealed by the interviews (Figure 2). The above survey results indicate that these are major factors hindering utilization of EHR with CSA.

Figure 2

Major Factors Hindering Utilization of EHR With CSA



Conclusion

We summarize according to the research questions, based on the differences between general EHR & EHR with CSA. In the case of utilization of general EHR, it is easy to share understanding and build collaborative relationship through regular communication regarding educational roles and contents. In addition, teachers can understand it within the scope of their school knowledge, accept it without rejection feeling, and coordinate it easily.

In conclusion, the major issues revealed hinder the collaborative relationship are as follows. Despite conflicts in mutual understanding security education contents and peace education, and lack of recognition about educational role of EHR with CSA as dialogue partner, collaborative communication has not been achieved, resulting in vertical relationship. And factors are EHR with CSA's distrust and discouragement to teachers' indifference, rejection, and aversion toward security knowledge, make them avoid communication or give up.

Future Issues

Future research will conduct extensive interviews and further research on issues and factors. Especially, we will reconsider collaborative relationship between EHR with CSA and teachers and students, and the ideal collaborative approaches by EHR with CSA. Additionally, we will survey issues facing teachers by interviews. Finally, we aim to consider helpful guidelines to assist EHR with CSA.

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A Thought Experiment to Investigate the Origin of Gender-Based Division of Labor

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Abstract

This article presents a thought experiment (Brown & Yiftach, 2023) to investigate the origin of sexual division of labor. The purpose is to grasp the inner logic of the transformation rather than describing the actual historical process. We believe that a clear understanding of the origin of gender-bias will help us to mitigate its harmful effects and establish an unbiased society. Empirical study suggests that sexual division of labor evolved during the Upper Paleolithic era (Kuhn & Steiner, 2006). Anthropological research indicates that sex based division of labor gave modern humans some advantage over the Neandertals (Lovegren, 2006). Scholars have offered various explanations of gender-bias *e.g*. power and private property (Engels, 1877), Biological (Mardock, 1949), Biogrammers (Tiger & Fox, 1971) etc. Scientists, Historians and Philosophers have investigated the gendered power structure (De Beauvoir, 2015; Engels, 1877; Harari, 2015; Lerner, 1986; Walby, 1989) extensively. This study considers a small group of hunter-gatherers. It's struggle for existence can be modelled as a constrained multi-objective optimization problem (Liang et al., 2024) to maximize food security, minimize child and female mortality under the constraints of limited food supply, inter-group competition, uncontrolled pregnancy, disease, injury etc. Three orthogonal systems, namely, i) *gender-neutral*, ii) *male as homemaker-caregiver and female as protector-provider*, and iii) *female as homemaker-caregiver and male as protector-provider* were evolved over successive generations. Outcome analysis indicates that third system ensures best fitness for survival and growth. However, this study addresses only the pre-historical origin of sexual division of labor. Important aspects *e.g*., cultural diversity, social evolution, gender dynamics etc. are later developments.

Keywords: gender, labor, optimization, fitness, survival

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Introduction

In traditional social systems, women are confined within the domestic spheres in contrast to men who undertake all enterprises in the outside world, beyond the domestic boundary. Apparently, such gender-based division of labor has resulted in a hierarchical power structure where the women are placed at a level lower than the men (De Beauvoir, 2015; Engels, 1877; Harari, 2015; Lerner, 1986; Walby, 1989). This article intends to investigate the origin of such gender-based division of labor. The purpose is to arrive at a plausible explanation of the underlying historical process. It is expected that a clear understanding of such causal relationship will help us to establish an enhanced level of social justice and harmony.

Philosophers, social scientists, social anthropologists and others have considered the issue of gender-based division of labor from various perspectives. Friedrich Engles, in his celebrated work "The Origin of the Family, Private Property and the State" (Engels, 1877) has emphasized the role of private property in "*the world historic defeat of the female sex*". In (Tiger & Fox, 1971), Lionel Tiger and Robin Fox emphasized the role of biogrammers, i.e., genetically programmed features that distinguish men from woman in terms of aggressiveness, dominance, compassion, love etc. Tiger and Fox argued, men were naturally inclined to take the role of hunter-gatherer and women the homemaker and caregiver. Similar explanation, based on the biological difference between man and woman, was provided by George Peter Mardock (Mardock, 1949). Men are, in general, physically stronger than women. Therefore, they are naturally suited for activities that require muscle power, e.g., hunting, fighting etc. This eventually makes them fit for the role of protector-provider of the family. Women, on the other hand, are physically weak and soft. Women become even more vulnerable during pregnancy. After childbirth, women must breastfeed the baby. Breastfeeding is an activity which inherently supports the feelings of love and compassion. For these reasons, according to Mardock, women naturally fit to the role of home maker and caregiver.

To investigate this issue, this article proposes to consider the social dynamics of a pre-historic hunter-gatherer community over several successive generations. It is argued that the struggle for existence of such a community could be modeled as a constrained multi-objective optimization problem (Liang et al., 2024). Three orthogonal social structures were allowed to evolve through several generations. Eventually, the social structure (and the corresponding division-of-labor) that improves the survival fitness and fosters growth of the community, got stabilized over time. Structures which resulted in sub-optimal survival fitness have either died out or remained isolated systems without further growth.

The Thought Experiment

A thought experiment (Brown & Yiftach, 2023) is an imaginary situation which is logically consistent but not necessarily empirically feasible. The present thought experiment is concerned about a small group of primitive hunter-gatherers. The size of the population is about 50. A larger group may be ruled out because the prehistoric communication technique was not adequately developed to support the cooperation among a larger group of humans (Harari, 2015). The group consists of adult males, females and children. The group exists as a commune. Family structure is yet to develop. Both the male and female are free to mate with anyone of his/her choice. Reproductive activities, i.e., mating, pregnancy, childbirth, feeding the newborn, raising the newborn etc. are biologically decided. Motherhood is biological. There is no system to identify the biological father. However, the community has learnt the

controlled use of fire. Food, especially non-vegetarian food, is cooked. Members of the community either live in caves or makeshift shelters temporarily. They move from place to place depending on the availability of food or other living conditions.

Optimization Goals

The entire community would like to survive and grow just as its individual members. From this point of view, the following optimization goals may be set for our primitive community: i) maximize food security, ii) maximize female fertility (to ensure growth of the community), iii) minimize female mortality (to maintain birth rate. Men, however, as sperm-donors, are easily replaceable and therefore indispensable), iv) minimize miscarriage of unborn baby, v) minimize child mortality (to ensure growth), and so on. All these factors contribute to the maximization of survival fitness of the entire group of humans.

Constraints

In their struggle for existence, the members of this pre-historical community are constrained by several factors *e.g*., i) scarcity of food, or uncertainty of food supply, ii) competition with other groups, iii) competition with other animals, iv) high child mortality, v) female death during childbirth, vi) death or injury during fight with animals or other groups, vii) miscellaneous risk factors in the wild surroundings, viii) lengthy human childhood and so on. Let us now consider the activities of the individual members as well as the community.

Activities

Members of this prehistoric group of human beings are engaged mostly in biological activities e.g. food gathering, cooking, hunting, fighting against aggressors, mating, childcare, and so on. Some of these activities are collaborative. For instance, hunting, or fighting against enemies are more effective when done as a group. Mating is undoubtedly a private affair between two individuals. So too is breastfeeding. Eating is personal, but also social to some extent in the sense that quite often they enjoy a meal together.

Three Orthogonal Structures

Suppose there are three such groups, *viz*. Group *A*, Group *B* and Group *C*. In the beginning each of these three groups follows primitive egalitarianism. But then the three groups underwent a transformation to structures based on three orthogonal systems of division of labor. Group *A* continues primitive gender-equality without any change in social structure. In Group *B* the male acts as the homemaker-caregiver while female is the protector-provider. In Group *C*, however, the female is the homemaker-caregiver and the male becomes the protector-provider. We allow these three groups to evolve over consecutive generations.

Outcome Analysis

The effect of such gender-based divisions of labor on the respective populations should be observable after several generations. *Group-A* should maintain status quo. As the social structure remains the same, it continues its state of primitive gender neutrality. In the absence of any dramatic change in geography or climate, this group neither grows, nor shrinks. It is unlikely to develop any cultural element within its animalistic existence, just like other animals on earth. *Group-B* undergoes changes in several aspects. Mobility and agility of

pregnant females are less than normal. Females with newborn babies are less likely to provide their full efforts to activities like hunting or food gathering. Consequently, Group-*B* suffers reduced food security. Again, since females take the role of protector-provider, they are exposed to higher risks of physical stress and injury than their male counterpart. This leads in increased chance of miscarriage. Therefore, female fertility rate of Group-*B* decreases after several generations. Due to same reason female mortality rate increases. Increased miscarriage and reduced food security leads to a higher rate of infant mortality. The net result of all these factors is that the Group-*B* became less fit to survive. Finally, *Group-C* undergoes the reverse trend of Group-*B*. Here females are able to devote full attention to their children in the relatively peaceful and secured shelter. For them risks of physical injury, miscarriage etc. are reduced. However, males are able to apply their muscle power maximally for the purpose of hunting-gathering for all members of the group, including the females. So Group-*C* could enhance its food security. Similarly, female fertility rate increases. Female mortality rate as well as infant mortality rate decreases. The only adverse effect is higher risk of physical injury and death for the males as they are exposed to the dangers to a greater extent. But male lives are less critical as compared to female lives. Eventually Group-*C* is able to enhance its fitness for survival and growth.

Let us summarize. There is no tangible change in Group-*A* as it continued its primitive equality. Due to decline in food security, reduced female fertility, increased child mortality and increased female mortality Group-*B* becomes less fit to survive. Group-*B* shrinks over successive generations. Exactly the opposite happens to Group-*C*. This group could enhance its food security, improve female fertility rate, reduce child mortality rate, and decrease female mortality. Hence Group-*C* enhances its survival fitness and grows.

Conclusions

A thought experiment that encapsulates the historical process of transformation from primitive gender-neutral egalitarian society to a system of gender-based division of labor has been presented in this article. The experiment considers a small prehistoric group of hunter-gatherers. It is argued that the struggle for existence of such a community can be formulated as a multi-objective, constraint-satisfying, optimization problem where the group would like to maximize food security, maximize female fertility, minimize female mortality, and minimize child mortality. Several challenges faced by the group in attaining these goals have been taken into consideration. If the primary activities of the members of such prehistoric hunter-gatherers include food gathering, hunting, fighting (against aggressors, or other carnivorous animals), elementary cooking, childcare etc. then a division of labor could help the community to perform these activities efficiently. Accordingly, three orthogonal divisions of labor were taken into consideration. Three identical groups, Group *X*, Group *Y* and Group *Z*, simultaneously start their journey by adapting the three types of division of labor. The first option is trivial with no division of labor at all. Therefore, Group *X* maintains status–quo. The second option, followed by Group *Y*, ascribes the female members the role of protector-provider and the male members that of homemaker-caregiver. We show that the survival fitness of Group *Y* drops over successive generations. This community becomes progressively weaker, and eventually the population shrinks. The reverse effect occurs in Group *Z* where the males act as protector-provider and females as homemaking-caregiver, thereby making Group *Z* best fit for survival and growth over successive generations. In short, we may conclude that the present gender-based division of labor has been adopted almost universally by the entire humanity over thousands of years because it helped human societies to survive

and grow. However, relevance of this gender based division of labor in the contemporary world is a debatable issue.

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Improving Stroke Care Access With a Mobile Stroke Unit: Evidence From a Community Hospital in Southern Thailand

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Abstract

Background: Stroke is a critical public health issue in Thailand, where timely treatment is essential but often remains unmet. This study evaluated the impact of a Mobile Stroke Unit (MSU) at Cha-uat Hospital, a community hospital. We examined its effect on stroke care access, diagnosis, and overall outcomes across three distinct phases: before MSU implementation, during its initial operation, and after it was fully established.
Methods: This multiple cross-sectional study analysed data from 478 stroke patients. Patients were grouped into three periods: 116 before MSU, 176 during its implementation, and 186 after full operation. Patient data from the hospital's health information systems focused on service access and clinical improvements.
Results: MSU implementation led to a significant increase in overall stroke patient numbers (from 116 to 186) and enhanced diagnosis of ischemic stroke. Crucially, referrals to higher-level hospitals sharply declined (from 116 to 10 cases), indicating effective on-site care. The healthcare network also expanded, providing services to previously unserved community hospitals. However, while timely patient arrivals saw a slight, non-significant improvement (from 46.55% to 49.46%), a major challenge was the continued preference for self-transport over MSU/Emergency Medical Services.
Conclusion: The MSU effectively increased stroke service access, improved early diagnosis, and expanded the healthcare network. Yet, overcoming behavioural barriers to timely access and encouraging emergency transport use remains critical. Further research on cost-effectiveness and influencing factors is recommended to optimize future stroke care delivery.

Keywords: stroke, mobile stroke unit, stroke care access, community hospitals, healthcare network

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Introduction

Stroke is a leading cause of death and disability globally (Feigin et al., 2021), especially in developing countries. Additionally, it is a significant public health issue both globally and in Thailand (Kumluang et al., 2023). It is the second leading cause of death and the third leading cause of disability. Between 2019 and 2023, Thailand saw an increase in the number of new stroke cases, rising from 5.87 to 7.75 per 100,000 people. While incidence increased, the mortality rate for stroke actually decreased from 5.53 to 4.61 per 100,000 during the same period. This trend has major implications for healthcare costs and the overall burden of care (Kim et al., 2020).

Stroke It can be divided into transient ischemic attack (TIA), ischemic stroke (IS), hemorrhagic stroke (HS), and subarachnoid hemorrhage. Acute ischemic stroke (AIS).(Waziry et al., 2020) with ischemic stroke being the most prevalent type.(Kuriakose & Xiao, 2020) Identifying stroke symptoms quickly, often by using the FAST/BEFAST acronym, is essential for ensuring timely treatment (Chen et al., 2022). Therefore, early recognition of stroke is crucial, and using prehospital stroke scales can help identify suspected cases promptly for effective acute treatment (Duvekot et al., 2021). Cha-uat Hospital, a community hospital in southern Thailand serving a population of over 85,968, treats more than 200 stroke patients annually. Despite their efforts, the hospital has consistently struggled to achieve the national target of 80% of patients receiving timely treatment within 4.5 hours. Rates for timely access at Cha-uat Hospital ranged from 44.48% to 60.76% between 2019 and 2023, highlighting ongoing challenges with delayed patient access to care.

To address this critical problem, Cha-uat Hospital launched an Emergency Medical System incorporating a Mobile Stroke Unit (MSU) in 2023. This MSU is designed to provide faster and more effective treatment for stroke patients and extends its services to three nearby districts (Ellens et al., 2022). This study aims to examine how the MSU has affected stroke patients' access to care across three periods: before the MSU's introduction, during its initial operation, and after it became fully implemented. The ultimate goal is to assess how improved access and timely treatment through the MSU system can help reduce mortality, disease severity, and disability among stroke patients.

Methods

This study used a multi-phase approach to look at stroke care, analysing data over an 18-month period. We initially collected information from 551 stroke patients. However, 73 cases were excluded based on specific criteria, leaving 478 patients for our detailed analysis.

The study was structured into three distinct time periods to evaluate the impact of the Mobile Stroke Unit (MSU). Before the MSU was introduced (Pre-MSU implementation), this phase included 116 patients. During the initial phase of MSU operation (Initialling MSU implementation), this period involved 176 patients. After the MSU became fully established and operational (MSU fully Implemented). this final phase included 186 patients.

All patient data were extracted from Cha-uat Hospital's existing health information system. To identify stroke patients, we specifically used ICD-10 codes I60-I69 and G459.This study evaluates the impact of a Mobile Stroke Unit (MSU) on stroke care access in a southern Thailand community hospital. Our main focus was to assess patient access to services. We

used basic descriptive statistics to compare these factors across the three time periods. This methodology allowed us to understand the changes in stroke care access and outcomes after the MSU system was put in place. Ethical approval for the study was obtained from the Human Research Ethics Committees of Thaksin University (COA No. TSU 2024_141, REC No. 0369).

Results

This section details the findings from an 18-month multi-phase cross-sectional study (Yi et al., 2019) on the impact of a Mobile Stroke Unit on stroke care access at Cha-uat Hospital and its network in southern Thailand. The results are presented across several key areas: the demographic characteristics of the patients, the overall trends in service access, changes in stroke diagnosis and referral patterns, the expansion of the service network, the timeliness of care, and patient transportation behaviours.

Demographic Characteristics of Stroke Patients

The study analysed data from 478 stroke patients who met the inclusion criteria. The demographic profile of this sample group revealed several key characteristics.

Overall Sample Description

The patient population was slightly predominantly male, with 55.02% being male and 44.98% being female (Table 1). The average age of stroke patients was 65.97 years, with a standard deviation of 15.15 years, indicating a broad age range within the patient group. This average age highlights that stroke primarily affects an older demographic in this region, which aligns with general stroke epidemiology.

In terms of religious affiliation, the vast majority of participants were Buddhist, accounting for 96.65% (462 individuals) of the sample. This reflects the predominant religious demographic of the region. Regarding occupations, a significant portion of patients were involved in primary industries: agriculture was the primary occupation for 48.53% (232 individuals), followed by general labour at 30.12% (144 individuals), and other occupations making up 15.48% (74 individuals). This occupational distribution suggests that a considerable number of stroke patients in this community are engaged in physically demanding jobs, which could have implications for their health and recovery.

The health history of the patients showed a high prevalence of chronic diseases, which are known risk factors for stroke. The most common underlying conditions were hypertension (24.05% or 115 individuals) and diabetes (16.32% or 78 individuals). Other chronic diseases accounted for 3.97% (19 individuals). These figures underscore the importance of managing chronic conditions within the community to potentially reduce stroke incidence. In terms of health behaviours, a majority of patients reported never smoking (55.23%) and not consuming alcohol (61.92%). This indicates that while chronic diseases are prevalent, lifestyle factors such as smoking and alcohol consumption might be less influential for a substantial portion of this specific stroke population, or that other risk factors are more dominant.

Table 1
Characteristics of Stroke Patients at Cha-uat Hospital

Variable	pre-MSU implementation		during implementation		post-implementation		Total	
	N	%	N	%	N	%	N	%
Gender								
Male	66	13.80	95	19.87	102	21.33	263	55.02
Female	50	10.46	81	16.94	84	17.57	215	44.98
Religion								
Buddhism	115	24.06	167	34.94	180	37.66	462	96.65
Islam	1	0.21	8	1.67	4	0.84	13	2.72
Christianity	-	-	-	-	1	0.21	1	0.21
Other	-	-	1	0.21	1	0.21	2	0.42
occupation								
Not working	4	0.84	-	-	-	-	4	0.84
Student	1	0.21	-	-	2	0.42	3	0.63
Civil servants/ retired employees	2	0.42	2	0.42	1	0.21	5	1.05
Employee	32	6.70	54	11.30	58	12.13	144	30.12
Trade/Private business	6	1.25	3	0.63	7	1.46	16	3.35
Agriculture	64	13.39	83	17.36	85	17.78	232	48.53
Other	7	1.46	34	7.11	33	6.90	74	15.48
Underlying disease								
No underlying diseases	74	15.48	89	18.62	102	21.34	265	55.44
Heart disease	1	0.21	-	-	-	-	1	0.21
Diabetes	15	3.14	37	7.74	26	5.44	78	16.32
Hypertension	21	4.39	43	8.99	51	10.67	115	24.05
Other	5	1.05	7	1.46	7	1.46	19	3.97
Smoking								
Yes	56	11.71	75	15.69	83	17.36	214	44.77
No	60	12.55	101	21.13	103	21.55	264	55.23

Variable	pre-MSU implementation		during implementation		post-implementation		Total	
	N	%	N	%	N	%	N	%
Alcohol								
Yes	48	10.04	61	12.76	73	15.27	182	38.07
No	68	14.22	115	24.06	113	23.64	296	61.92
Chief complaint (B E F A S T)								
Balance	43	3.60	41	3.43	34	2.85	118	9.88
Eye	3	0.25	6	0.50	14	1.17	23	1.93
Face	40	3.35	59	4.94	68	5.70	167	13.99
Arm	93	7.79	154	12.90	141	11.81	388	32.50
Speech	60	5.03	98	8.21	108	9.05	266	22.27
Time	54	4.52	88	7.37	90	7.54	232	19.43

The mean age of patients was 65.97 years (SD = 15.15).

Chief Complaints/Symptoms

When arriving for care, the stroke patients presented with a variety of symptoms, often identifiable using the BEFAST acronym (Table 1). The most frequently reported primary symptom was unilateral limb weakness, affecting 80.75% of patients. This is a classic and highly recognisable sign of stroke, indicating motor impairment on one side of the body. Following this, slurred speech, unclear speech, or difficulty finding words was reported by 55.85% of patients. Facial asymmetry or drooping on one side was observed in 34.93% of cases. These symptoms align with typical presentations of stroke and highlight the critical need for rapid recognition and response to facilitate timely medical intervention.

Demographic Shifts Across Implementation Phases

An examination of patient demographics across the three study periods (pre-MSU, initial MSU implementation, and fully implemented MSU) revealed some shifts.

While males consistently comprised a larger proportion of patients across all phases, the *absolute numbers* of both male and female patients increased. In the pre-MSU phase, there were 66 males and 50 females (Table 1). During implementation, these numbers rose to 95 males and 81 females. Post-MSU implementation saw further increases to 102 males and 84 females. This reflects the overall increase in patient access rather than a significant shift in gender proportion within the stroke population itself.

Patients with underlying diseases were 42 in the pre-MSU phase, increasing significantly to 87 during implementation, and then 84 post-implementation. Conversely, patients with no reported underlying diseases initially increased from 74 to 89, then further to 102. This suggests that the MSU might be reaching a broader group of patients, including those who may or may not have known chronic conditions.

The average age of patients also varied across the phases. Before the MSU, the average age was 68.56 years. This decreased to 64.35 years during the initial implementation phase, suggesting that the MSU was potentially more effective at reaching slightly younger patients who might have a higher likelihood of benefiting from timely intervention. In the post-implementation phase, the average age slightly increased again to 65.87 years. This fluctuation could reflect the evolving reach and integration of the MSU within the broader healthcare system.

Trends in Stroke Patient Access to Services

The implementation of the Mobile Stroke Unit had a notable impact on the overall number of stroke patients accessing services and on diagnostic patterns.

Overall Increase in Patient Numbers

A clear and consistent upward trend in the number of stroke patients accessing services was observed across the three phases of the study. We found that, before MSU implementation, 116 patients received services. During the initial phase of MSU implementation, the number of patients significantly increased to 176. After the MSU became fully operational, the number of patients further increased to 186. This continuous increase indicates that the introduction and establishment of the MSU had a positive impact on service accessibility, effectively expanding opportunities for the public to receive care. This quantitative rise suggests that the MSU was successful in reaching more individuals in need of stroke services within the community and its network. The increase in patient numbers reflects the unit's effectiveness in expanding opportunities and improving public access to services, particularly for those in remote areas who may have previously faced barriers to care.

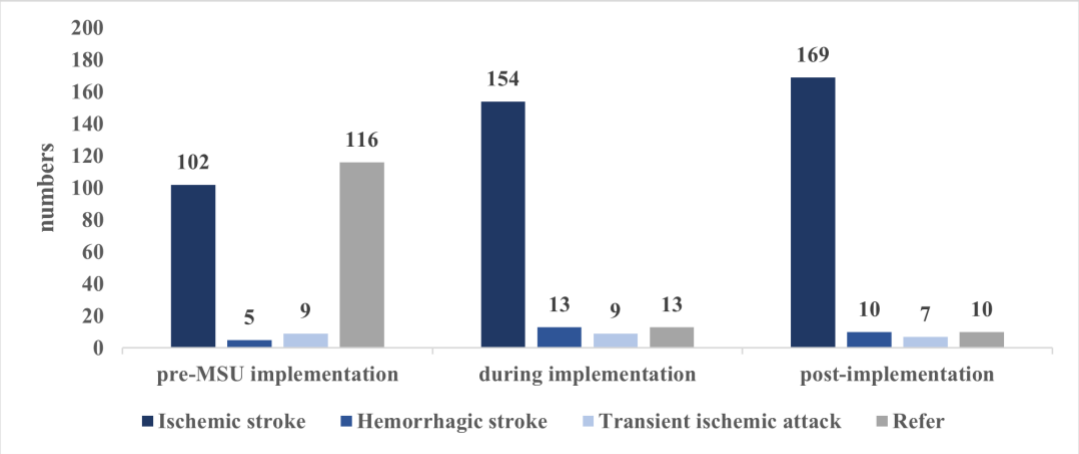
Impact on Patient Demographics During Phases (Average Age)

As noted in the demographic section, the change in average age across the phases is an important observation related to access. The average age of patients decreased during the initial deployment of the MSU, from 68.56 years pre-MSU to 64.35 years during implementation. Although it slightly increased to 65.87 years post-implementation, this initial decrease suggests that the MSU was potentially able to reach younger patients more quickly. This could be a result of improved screening efficiency or more proactive community health campaigns that encouraged earlier presentation for symptoms. Reaching younger patients earlier can be particularly important for long-term outcomes and disability reduction.

Changes in Stroke Type Diagnoses and Referral Patterns

Figure 1 illustrates the distribution of stroke types and referral patterns across the three periods, revealing important insights into the MSU's diagnostic capabilities and impact on hospital burden. The number of patients diagnosed with ischemic stroke showed a continuous increase across all three phases: 102 cases pre-MSU, 154 during implementation, and 169 post-implementations. This consistent rise strongly suggests that the MSU enhanced early and accurate diagnosis of ischemic strokes, leading to more effective initial treatment at the point of care. The MSU's ability to diagnose on-site likely contributed to this improved identification.

Figure 1
Number of Stroke Patients Classified by Type



In contrast to ischemic stroke, the number of patients diagnosed with haemorrhagic stroke and Transient Ischemic Attack (TIA) remained relatively stable, showing only slight variations across the phases. This stability indicates that while the MSU improved the detection of ischemic strokes, it maintained consistent identification of other stroke types.

A significant finding was the drastic reduction in the number of referred cases after the MSU implementation. Referrals decreased from 116 cases pre-MSU to just 13 during implementation, and further to 10 post-implementations. This marked decrease strongly indicates that the MSU was effective in providing on-site diagnosis and initial treatment, thereby reducing the need for patients to be transferred to higher-level healthcare facilities. This reduction in referrals is crucial as it lessens the burden on tertiary hospitals and strengthens the capacity of community hospitals to manage early-stage stroke care directly.

Expansion of Service Network

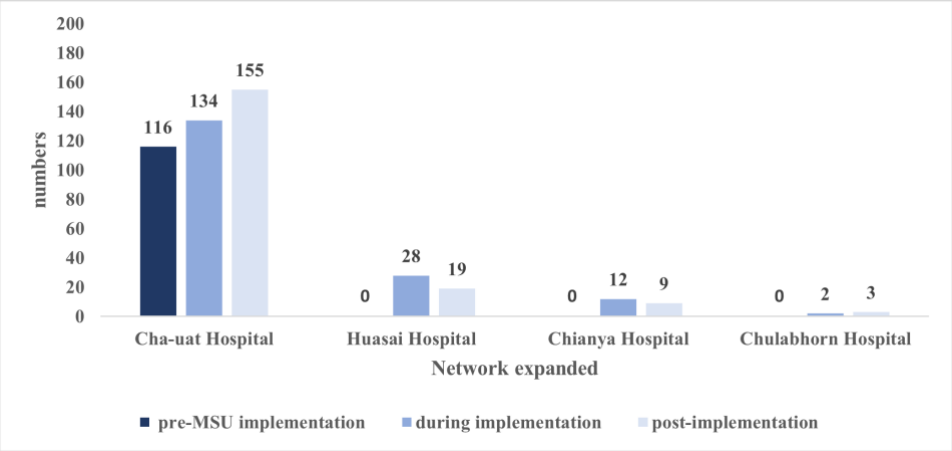
The study provided clear evidence that the MSU operation led to a significant expansion of the stroke service network. Figure 2 illustrates this expansion across Cha-uat Hospital and its network hospitals.

Increased Access at Main Hospital

Cha-uat Hospital, which serves as the main facility in the area, experienced a continuous increase in the number of service recipients. The patient count at Cha-uat Hospital rose from 116 patients before MSU implementation, to 134 during implementation, and further to 155 patients post-implementation. This consistent rise in numbers at the primary hospital directly reflects an increase in access to services within the main service area of Cha-uat Hospital.

Figure 2

Comparison of the Number of Service Recipients in Network Hospitals



New Access in Network Hospitals

A particularly significant outcome of the MSU implementation was its impact on the surrounding network hospitals: Huasai Hospital, Chian Yai Hospital, and Chulabhorn Hospital. Crucially, these hospitals did not provide stroke services before the MSU was implemented. However, with the introduction of the MSU, they started receiving service recipients both during the implementation phase and after the full implementation.

This demonstrates a clear expansion of the service network to secondary hospitals located in more remote areas. The MSU's operations not only increased access at the main hospital but also efficiently extended the reach of stroke care services to these peripheral facilities. This extension of the service network is a testament to the MSU's role in establishing a more comprehensive primary healthcare service network, which is vital for reducing healthcare access disparities among the population, especially for individuals residing in remote communities.

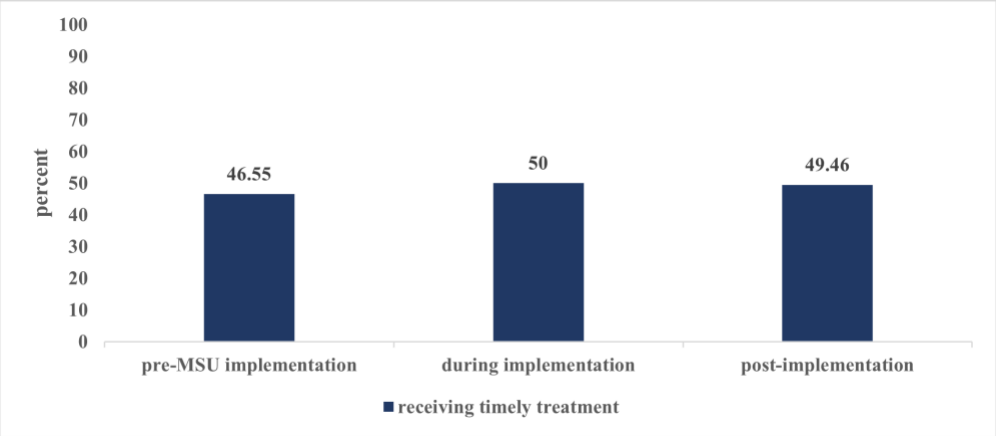
Timeliness of Access to Care

While the overall number of patients accessing care increased substantially, the study also examined the proportion of patients receiving timely treatment, defined as within 4.5 hours.

Proportional Timely Access Across Phases

Figure 3 illustrates the percentage of patients receiving timely treatment across the three study periods. Before the MSU was introduced, 46.55% of patients received timely treatment. During the pilot phase of MSU operation, this proportion increased to 50.0%. During full implementation, the percentage slightly decreased to 49.46%. This indicates a positive trend towards improvement in timely arrivals. The initial increase from 46.55% to 50% during the pilot phase suggests an immediate positive effect of the MSU in facilitating quicker access to care for a greater proportion of patients.

Figure 3
Graph Showing Timely Access to Services Among Stroke Patients



Statistical Significance and Implications

Despite the observed positive trend in timely access, the differences across the periods were not statistically significant. This finding suggests that while the MSU successfully brought more patients into the system, and many of them received care more quickly, the overall percentage of patients reaching the hospital within the crucial 4.5-hour window did not show a statistically robust improvement. The lack of statistical significance indicates that there may still be limitations in patient transport systems or persistent behavioural factors within the population that affect the speed at which patients seek and receive care. This highlights a continuing challenge in achieving the national target of 80% timely treatment and suggests that sustained efforts beyond just the MSU deployment are necessary to overcome these remaining barriers to rapid access.

Patient Transportation Behaviour

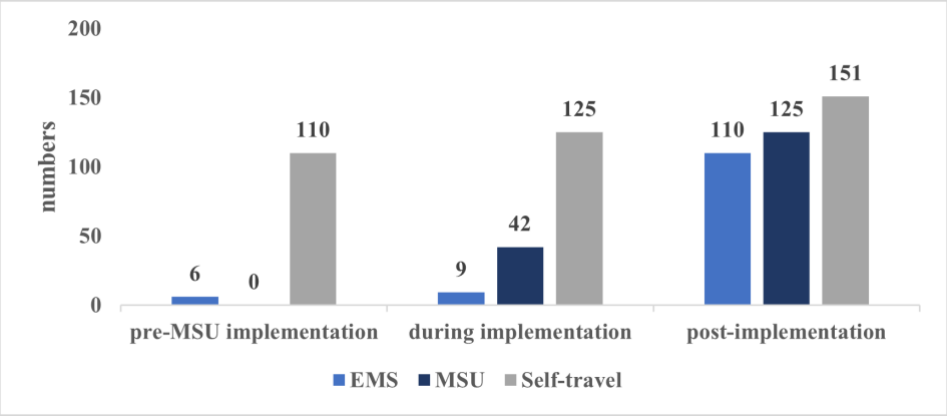
The study also investigated how stroke patients arrived at the hospital, revealing important patterns in transportation choices.

Preferred Mode of Transport

Figure 4 provides a comparison of transportation methods used by patients in the post-implementation period. It was found that a significantly higher number of patients continued to travel to the hospital by themselves. This means patients were arriving via private vehicles, taxis, or other non-emergency means rather than relying on medical transport services. Specifically, the number of patients using self-transport exceeded those using the Mobile Stroke Unit (MSU) by 26 patients and those using Emergency Medical Services (EMS) by 41 patients in the post-implementation phase. Despite the availability and benefits of the MSU and EMS for stroke care, these findings reflect a continuing preference for self-transport among patients.

Figure 4

Access to Healthcare Services Among Stroke Patients



Implications for Service Utilisation and Public Education

This persistent trend of self-transport, despite the increase in MSU use (by 26 patients) and EMS use (by 41 patients) across the phases, highlights a critical area for future intervention. It suggests a need to build greater knowledge, understanding, and public confidence in emergency transport systems. Promoting the use of faster, potentially life-saving services like EMS or the MSU is crucial for maximising the efficiency and effectiveness of stroke care systems at the community level. Overcoming these behavioural patterns through sustained public health campaigns and education could further improve timely access and ultimately patient outcomes.

In summary, the results demonstrate that the MSU significantly increased the total number of stroke patients accessing services and expanded the healthcare network to rural areas. It also led to improved diagnosis of ischemic stroke and a substantial reduction in referrals to higher-level facilities. While there was a positive trend in timely access, this improvement was not statistically significant, and a challenge remains in modifying patient travel behaviours to encourage greater use of emergency medical transport.

Discussion

This study set out to evaluate the impact of a Mobile Stroke Unit on stroke care access in a community hospital in Southern Thailand, specifically Cha-uat Hospital. Our aim was to examine patient access to care across three distinct periods: before the MSU was put into action, during its initial operation, and after it was fully implemented. The ultimate goal was to assess whether the MSU system could reduce mortality, disease severity, and disability among stroke patients by improving access and ensuring more timely treatment, particularly within community hospitals and their wider networks (Mathur et al., 2019).

The results of this 18-month study clearly demonstrate that the implementation of the MSU at Cha-uat Hospital had a significant positive influence on healthcare access for stroke patients, both in terms of the number of people receiving care and the quality of that access. We observed a continuous and encouraging increase in the number of stroke patients seen by the hospital across all three phases: from 116 cases before the MSU was available, rising to 176 cases during its implementation, and further increasing to 186 cases once it was fully operational. This upward trend strongly suggests that introducing the MSU was crucial in

making healthcare more available to the local population, especially those living in rural areas or communities further away from the main hospital.

An interesting finding related to patient demographics was the change in the average age of those receiving services. Initially, during the early phase of the MSU's deployment, the average age of patients decreased from 68.56 years to 64.35 years. While it later slightly increased to 65.87 years post-implementation, this initial decrease suggests that the MSU was potentially able to reach younger stroke patients more quickly. This could be due to more effective screening processes or successful public health campaigns carried out within these communities, encouraging earlier recognition and response to stroke symptoms.

Beyond simply increasing the number of patients, the MSU also appeared to significantly enhance the diagnostic capabilities for stroke patients. We found a clear and continuous increase in the number of patients diagnosed with ischemic stroke from 102 cases pre-MSU, to 154 during implementation, and 169 post-implementation. In contrast, the numbers for hemorrhagic stroke and transient ischemic attack (TIA) remained relatively stable. This indicates that the MSU played a vital role in enabling earlier and more accurate diagnoses, which is critical for providing effective initial treatment right at the point of care. This improved on-site diagnosis and immediate treatment had a remarkable secondary benefit: a substantial reduction in patient referrals to higher-level hospitals. The number of referred cases dropped dramatically from 116 before the MSU, to just 13 during its operation, and then to 10 after full implementation. This significant decrease highlights the MSU's effectiveness in reducing the burden on larger, tertiary hospitals and, crucially, strengthening the capacity of community hospitals like Cha-uat to manage early-stage stroke care more independently.

Furthermore, the study clearly showed that the MSU led to a valuable expansion of the stroke care service network. While Cha-uat Hospital, as the main facility, experienced a continuous increase in its patient numbers, ranging from 116 to 134 to 155, demonstrating improved access in its primary service area, the impact extended beyond its direct doors. Importantly, other network hospitals, including Hua Sai Hospital, Chian Yai Hospital, and Chulabhorn Hospital, which did not provide these services before the MSU, began receiving stroke patients during and after its implementation. This expansion is compelling evidence of the successful establishment of a more comprehensive primary healthcare service network. By extending services to secondary hospitals in more remote areas, the MSU helped to reduce disparities in healthcare access across the population, making essential stroke care available to more people who previously had limited options.

Despite these significant improvements in overall access, diagnosis, and network expansion, the study identified continuing challenges, particularly concerning the timeliness of patient access to care. Although there was a slight increase in the proportion of patients arriving at the hospital within the recommended timeframes from 46.55% before the MSU, to 50.0% during its pilot phase, and 49.46% during full implementation this difference was not found to be statistically significant. This lack of substantial improvement in timely arrivals suggests that there may be ongoing limitations within patient transport systems or persistent behavioural factors within the population that hinder quick access to care. These issues indicate that ongoing efforts in health promotion and education are needed to overcome these barriers.

Another notable finding related to patient behaviour was that a significantly higher number of patients continued to prefer travelling to the hospital by themselves. This preference persisted even compared to those who utilised the MSU or standard Emergency Medical Services (EMS). While there was a slight increase in the use of MSU services by 26 patients and EMS by 41 patients, the findings underscore a critical need to build greater knowledge, understanding, and public confidence in emergency transport systems. Promoting the use of faster, life-saving services like EMS or the MSU is essential, as prompt transportation can significantly improve stroke outcomes. This highlights that simply providing the service is not enough; public awareness and trust are equally vital for maximising its effectiveness.

In conclusion, the establishment of the Mobile Stroke Unit has undeniably been effective in increasing access to stroke services, enabling faster and more accurate diagnoses, reducing the need for patient referrals to higher-level facilities, and successfully expanding public health service networks into remote areas. These are crucial steps forward in improving stroke care at the community level. However, challenges remain, particularly in modifying long-standing patient behaviours and achieving a statistically significant improvement in timely access to care. Addressing these persistent issues will require sustained, targeted efforts to educate the public and continuously optimise service delivery. Further research is also recommended to evaluate the cost-effectiveness of the MSU, to investigate other factors affecting access across diverse population groups, and to further refine and optimise the delivery of these vital services.

Conclusion (Limitations, and Implications)

The implementation of the Mobile Stroke Unit at Cha-uat Hospital significantly enhanced stroke care access, leading to a substantial increase in the total number of patients receiving services. This initiative also enabled faster and more accurate diagnoses of ischemic stroke, while remarkably reducing the need to refer patients to larger, higher-level hospitals. A key success was the expansion of the stroke care network, extending vital services to other, previously unserved network hospitals and thereby improving access for people in remote areas.

However, the study identified important limitations. Although there was an increase in the proportion of patients receiving timely treatment, this improvement was not statistically significant. This suggests persistent challenges in the speed of access. Furthermore, a significant number of patients continued to prefer travelling to the hospital independently, rather than utilising the quicker MSU or Emergency Medical Services (EMS).

The implications of these findings are clear: while the MSU effectively expands access and improves early diagnosis, ongoing public health education is crucial to address patient behavioural factors and ensure more timely care. For future planning, further research is recommended to evaluate the MSU's cost-effectiveness, explore other influences on access across diverse groups, and continually refine how these essential services are delivered.

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Healthcare Decentralization Impact on NCD Management: Four-Year Analysis of Thai Primary Care Centers (2021-2024)

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Abstract

Background: Thailand's public health decentralisation aimed to improve healthcare management and community participation at the local level. This study investigated the management of non-communicable diseases (NCDs), specifically diabetes and hypertension, in Tham Phannara District from 2021 to 2024. Methods: This descriptive cross-sectional study collected data from a community hospital, encompassing three provider types: the main hospital (PCU), Ministry of Public Health Primary Care Units, and Local Administrative Organisation Primary Care Units (LAO PHC). Data analysis focused on NCD types, medical check-ups, and key laboratory tests including Fasting Blood Sugar (FBS), Glycated Haemoglobin (HbA1c), LDL cholesterol, total cholesterol, and estimated Glomerular Filtration Rate (eGFR). Results: Medical check-ups significantly increased from 254 in 2021 to 1,795 in 2024. LAO PHCs emerged as pivotal providers, handling 1,273 check-ups in 2024. Most patients were female (67.60%), with an average age of 64.43 years. Hypertension was considerably more prevalent (69.70%) than diabetes (30.30%). While NCD management showed improvements in diabetes and lipid control, kidney function (eGFR < 90 mL/min/1.73m²) concerns rose significantly to 696 cases in 2024. Subdistrict Health Promoting Hospitals (SHPHs) generally demonstrated better HbA1c and LDL control compared to LAO PHCs, which exhibited more outliers and variability, indicating some inconsistent management in decentralised units. Conclusion: The findings confirm that decentralisation has substantially improved healthcare access and NCD management. The success of LAO PHCs highlights the potential of local-level care. Future efforts must focus on strengthening local health systems, standardising care protocols, and fostering collaboration to ensure equitable and high-quality services.

Keywords: healthcare decentralisation, non-communicable diseases, LAO primary care units, healthcare access, Thailand

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Introduction

Thailand's public health system is undergoing a significant shift, moving from centralised control to local management. The primary aim of this decentralisation is to enhance the efficiency of healthcare management at the local level by improving resource allocation and promoting community participation (Rao et al., 2023; Zon, 2021; Abimbola et al., 2019). However, the management of non-communicable diseases (NCDs), such as diabetes and hypertension, within the Tham Phannara Hospital network has faced several challenges (Belardi et al., 2024). These include a shortage of healthcare personnel and outdated health data systems, which can negatively impact the effectiveness of service planning and patient follow-up care (Klingensmith et al., 2010).

The Thai government is actively promoting the transfer of Health Promoting Hospitals (HPHs) from the Ministry of Public Health (MOPH) to be administered by Local Administrative Organisations (LAOs). While this move aims to encourage community participation, it has inadvertently led to staff shortages at HPHs. This shortage adversely affects the planning, delivery, healthcare utilisation, screening, and continuity of care for NCD patients. Consequently, patients may miss medical appointments, failing to receive proper healthcare packages like blood sugar tests and other laboratory assessments (Niyonsenga et al., 2021) (Haque et al., 2020). This situation reflects on the overall quality of healthcare services compared to the period before these facilities were transferred to LAO management (Noory et al., 2021; Mamo et al., 2024). This study examines non-communicable disease healthcare delivery in Tham Phannara district between 2021 and 2024, by analysing services from three different types of healthcare providers.

Method

This study employed a descriptive cross-sectional design to investigate the management of non-communicable diseases (NCDs) in Tham Phannara District, Nakhon Si Thammarat Province, Thailand. The research covered a four-year period, from 2021 to 2024. The main goal was to understand patient characteristics, how healthcare services were used, and the trends in annual health check-ups for individuals diagnosed with diabetes (ICD-10: E10–E14) and hypertension (ICD-10: I10–I15).

The study population included 2,471 registered patients who received NCD-related services within the Tham Phannara network during this timeframe. Data was gathered from three distinct types of healthcare providers, reflecting the decentralised public health system in Thailand. Tham Phannara Hospital (referred to as PCU): The main community hospital. Subdistrict Health Promoting Hospitals (SHPHs) under the Ministry of Public Health (MOHP PHC): These were five SHPHs that remained under central government administration. Subdistrict Health Promoting Hospitals transferred to Local Administrative Organisations (LAO PHC): These were four SHPHs that moved to local government management in 2022. Ethical approval for the study was obtained from the Ethics Committee for Research Involving Humans at Thaksin University, Thailand (COA No.TSU 2024_186 REC No.0374).

Patient service data was extracted from Tham Phannara Hospital’s Hosxp system. This involved identifying patients with diagnoses of diabetes, hypertension, or both. The research team prioritised variables that clearly showed how services were delivered and used by each patient, ensuring accuracy and completeness of the records. Data cleaning began with records from 2024 and was then traced backward to include information from 2023, 2022, and 2021

(Table 1). This allowed patient data to be categorised into the three aforementioned service groups (PCU, MOHP PHC, and LAO PHC).

Table 1
Diabetes and Hypertension Cases Treated at Tham Phannara Hospital (2021-2024)

Year	Number	Hospital DM/HT	SHPH DM/HT	LAO_SHPH DM/HT
2024	1,795	102/261	53/106	389/884
2023	1,389	75/203	39/86	306/680
2022	280	56/179	12/33	-*
2020	245	52/167	9/26	-*

Note. * = Data were collected from SHPHs during the period before the transfer to LAO

The data collected included demographic information, the specific types of NCDs (diabetes or hypertension), details of medical check-ups, and results from key laboratory tests. These laboratory tests included Fasting Blood Sugar (FBS), Glycated Haemoglobin (HbA1c), Low-Density Lipoprotein (LDL), total cholesterol, and estimated Glomerular Filtration Rate (eGFR). For analysis, descriptive statistics were used to summarise general patient information, service pathways, and costs. This involved calculating frequency distributions, percentages, means, and standard deviations. Microsoft Office Excel was used for initial data entry and organisation, while SPSS version 22 (Xiao et al., 2024) was employed for the main data analysis.

Results

The results of this study provide a comprehensive overview of non-communicable disease (NCD) management within the Tham Phannara district healthcare network from 2021 to 2024. The findings highlight significant trends in patient numbers, healthcare service utilisation, patient demographics, and the effectiveness of care delivery across the three main types of healthcare providers: Tham Phannara Hospital (PCU), Subdistrict Health Promoting Hospitals (SHPHs) under the Ministry of Public Health (MOHP PHC), and Subdistrict Health Promoting Hospitals transferred to Local Administrative Organisations (LAO PHC).

Overall Trends in Healthcare Utilisation and Patient Numbers

A substantial increase in the number of NCD patients and medical check-ups was observed throughout the study period. The total number of patients receiving care for diabetes and hypertension across all providers rose sharply from 245 in 2020 to 1,795 in 2024. This represents a nearly seven-fold increase in patient volume over these four years, indicating improved accessibility to healthcare services and greater public engagement in NCD management.

Looking specifically at medical check-ups, the number of cases increased from 254 in 2021 to 1,795 in 2024 (Table 2). In 2024, the distribution of these check-ups among the different provider types clearly demonstrated the emerging and crucial role of the decentralised LAO PHCs. In that year, LAO PHCs accounted for the highest volume, facilitating 1,273 check-ups. This figure far surpassed the 363 check-ups conducted by Tham Phannara Hospital (PCU) and the 159 check-ups by MOHP PHCs. This trend underscores the growing importance and capacity of local-level service providers, suggesting that decentralisation has played a significant role in expanding access to NCD care.

Table 2
General Characteristics of NCDs Patients by Type of Health Care Providers

Characteristics	Health care providers			
	Hospital (n = 363)	MOHP PHC (n = 159)	LAO PHC (n = 1,273)	Total
Gender				
Male	123	63	396	582
Female	240	96	877	1,213
Total	363	159	1217	1,795
NCDs (Pdx)				
DM	102	53	389	544
HT	261	106	884	1,251
Check-up*()				
2021	219	35	-	254
2022	235	45	-	280
2023	278	125	986	1,389
2024	363	159	1273	1,795

Table 3
Results of the Annual NCD Health Examination Laboratory According to Standard Criteria

Medical check-up*	Health care providers			
	PCU (mean)	NPCU (mean)	LAO NPCU (mean)	Total
1. DM				
1.1 FBS < 100				
2021	47(109.80)	8(128.51)	-	55
2022	67(128.17)	14(152.70)	-	81
2023	110(119.78)	47(126.62)	383(122.28)	540
2024	168(114.41)	71(119.51)	536(119.47)	775
1.2 HbA1C < 7.5				
2021	2(7.3)	1(0)	-	3
2022	33(8.7)	4(7.20)	-	13
2023	35(8.3)	17(8.42)	111(8.3)	163
2024	64(7.59)	28(7.48)	238(7.67)	330
2. HT				
2.1 LDL < 100				
2021	15(121.80)	54(121.46)	-	69
2022	61(107.71)	281(111.52)	-	342
2023	122(101.64)	47(108.54)	395(103.60)	564
2024	131(106.59)	47(102.35)	411(110.35)	589
2.2 Cholesterol < 200				
2021	14(208.29)	45(204.86)	-	59
2022	33(199.85)	138(199.44)	-	171
2023	39(131.54)	12(159.73)	111(137.18)	162
2024	15(134.29)	4(50.98)	45(134.16)	64
3. eGFR < 90				
2021	22(84.90)	7(88.02)	-	29
2022	66(74.74)	12(79.83)	-	78
2023	103(71.10)	43(76.50)	348(75.00)	494
2024	161(72.70)	59(75.76)	476(74.11)	696

Quality of Care: Laboratory Indicators and Control

The study also assessed the quality of NCD management by analysing annual health examination laboratory results according to standard criteria, focusing on key indicators for diabetes, lipid levels, and kidney function.

Diabetes Management (FBS & HbA1c)

For diabetes, improvements were noted in both fasting blood sugar (FBS) and glycated haemoglobin (HbA1c) control. The number of diabetic patients achieving an FBS level below 100 mg/dL steadily increased, reaching 775 cases in 2024. Similarly, the number of patients with an HbA1c level below 7.5% also rose, reaching 330 cases in 2024. Looking at specific provider performance, in 2023, PCUs demonstrated the best glycemic control with an average FBS of 101.64 mg/dL. By 2024, LAO PHCs showed optimal glycemic control, with an average FBS of 102.35 mg/dL (Table 3).

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Looking at specific provider performance. In 2023, PCUs demonstrated the best glycemic control with an average FBS of 101.64 mg/dL. By 2024, LAO PHCs showed optimal glycemic control, with an average FBS of 102.35 mg/dL. Figure 2 illustrates that while median FBS values across all patient groups remained above the target threshold of < 126 mg/dL, the overall trend indicated that most patients maintained acceptable fasting blood glucose levels relative to standard criteria, despite some outliers. However, Figure 1 revealed a disparity in HbA1c control: SHPH patients generally achieved better HbA1c control (median < 7%), whereas LAO_SHPH patients showed more than 30% outliers and greater variability in their HbA1c results. This inconsistency in diabetes management within LAO PHCs points to a need for targeted improvement strategies.

Figure 1
Comparison of FBS Test Results in Diabetic and Hypertensive Patients (2021-2024)

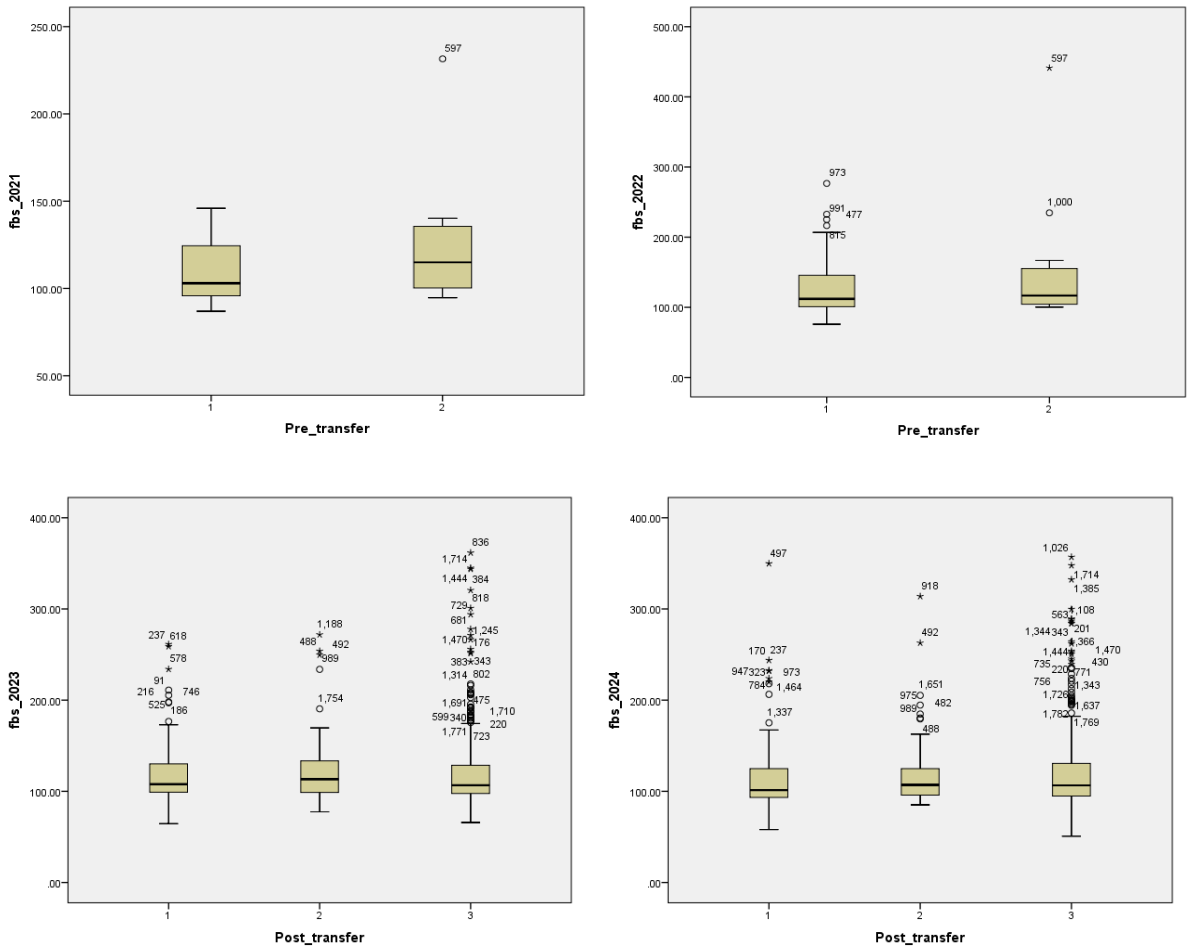
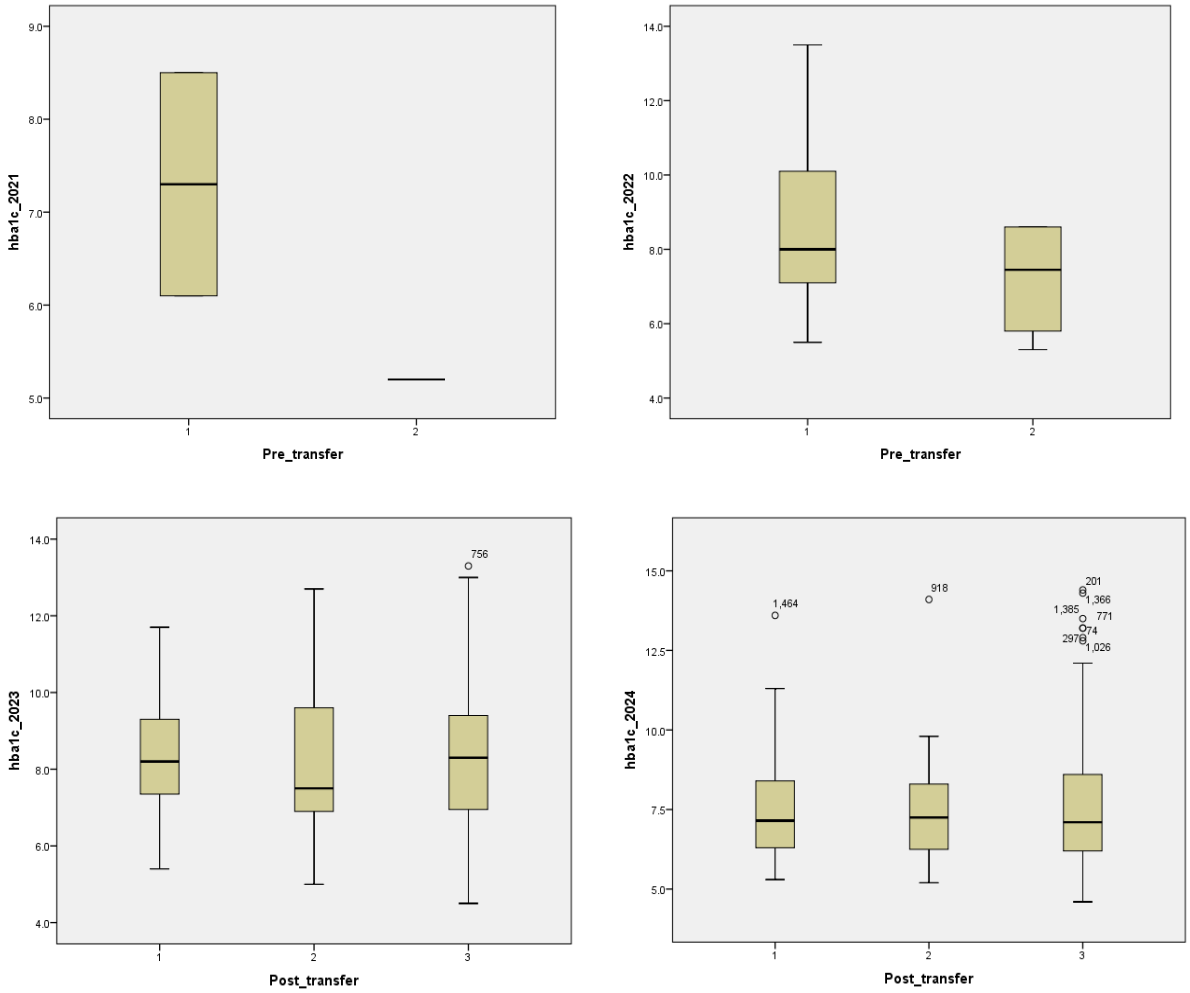


Figure 2
Comparison of HbA1c Test Results in Diabetic and Hypertensive Patients (2021-2024)



Lipid Management (LDL & Cholesterol)

Lipid control also showed mixed results. The number of patients with LDL cholesterol below 100 mg/dL improved, reaching 589 cases in 2024. In 2024, NPCU demonstrated optimal lipid management with an average LDL of 102.35 mg/dL. Figure 4 further detailed this, showing that SHPH patients achieved better lipid control, with median LDL levels meeting the target of < 100 mg/dL. In contrast, LAO_SHPH patients exhibited a higher number of LDL outliers and greater variability, suggesting inconsistent lipid management and a potentially higher risk of cardiovascular disease in this group. Regarding total cholesterol, while Figure 3 indicated that median values across all patient groups were close to or exceeded the standard threshold of < 200 mg/dL, generally remaining within an acceptable range, the overall control trend for total cholesterol declined slightly across the study period.

Figure 3
Comparison of LDL Test Results in Diabetic and Hypertensive Patients (2021-2024)

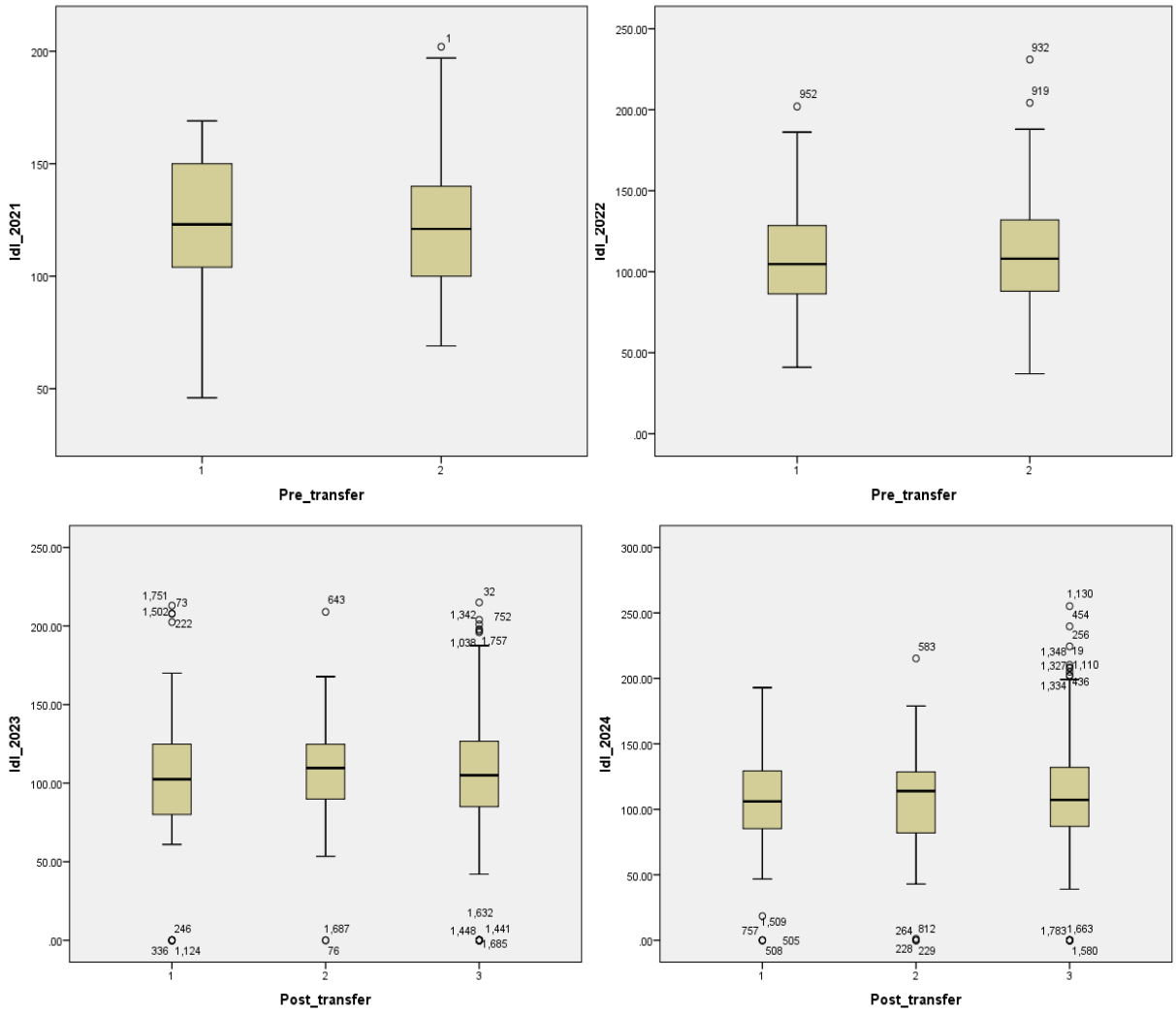
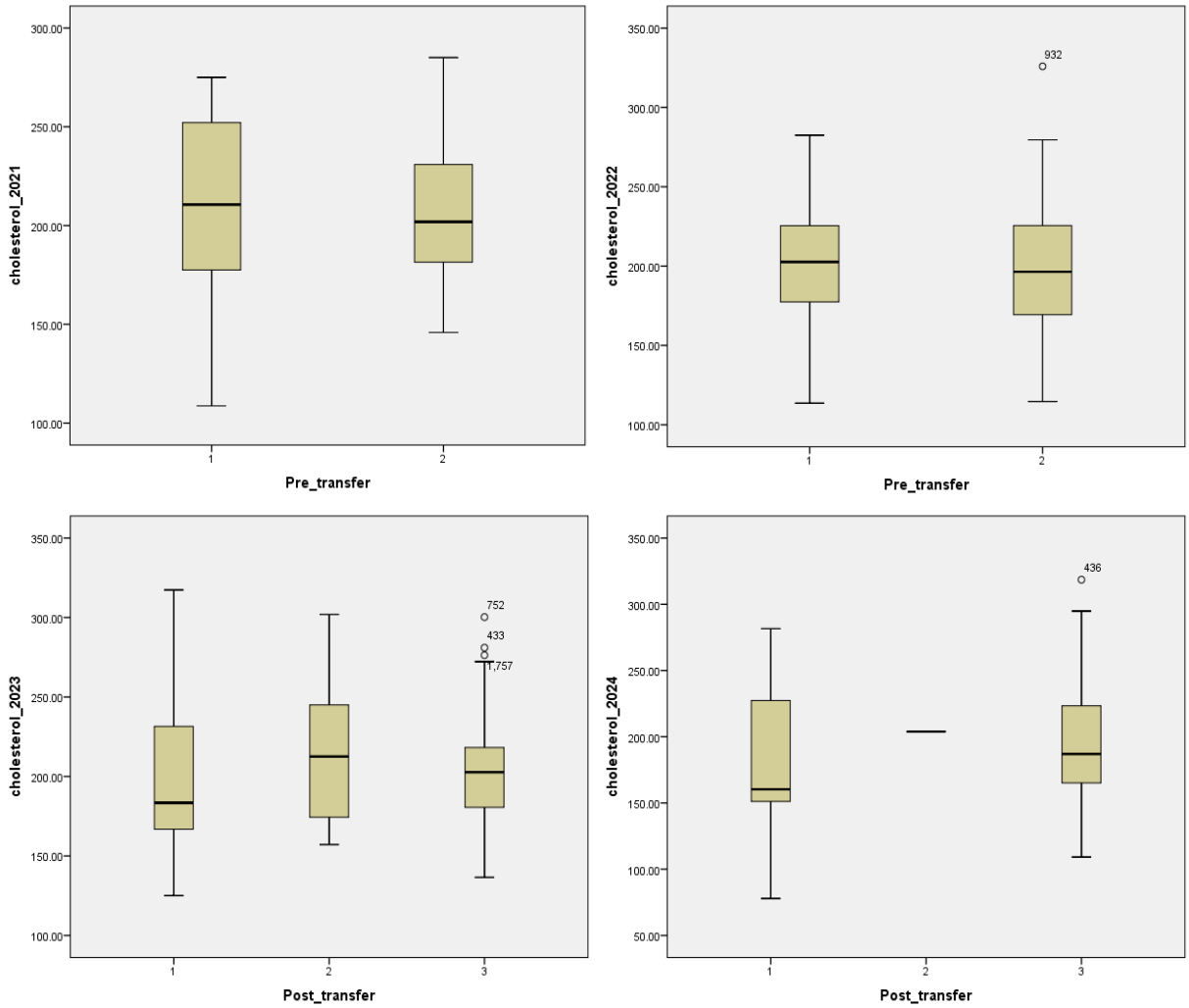


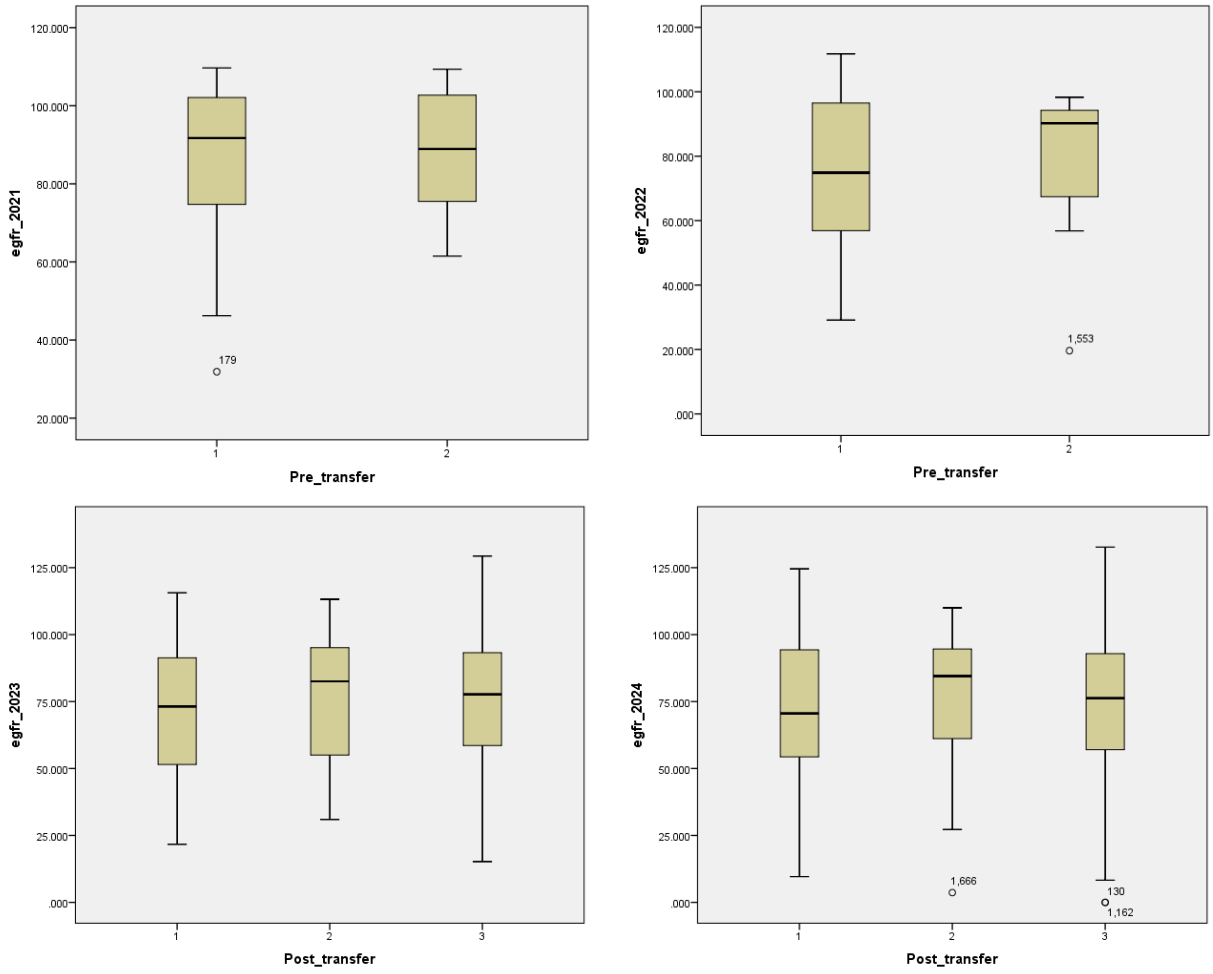
Figure 4
Comparison of Cholesterol Test Results in Diabetic and Hypertensive Patients (2021-2024)



Kidney Function (eGFR)

Assessment of kidney function using estimated Glomerular Filtration Rate (eGFR) revealed a concerning trend. The number of individuals with eGFR below 90 mL/min/1.73m² rose significantly, reaching 696 cases in 2024, indicating an increased risk of kidney impairment within the NCD patient population. Figure 5 highlighted that eGFR tended to decrease slightly each year in both SHPH and LAO_SHPH groups. However, the SHPH group was able to maintain its eGFR within the normal range (≥ 90 mL/min/1.73 m²) better than the LAO_SHPH group. The LAO_SHPH group showed a clear trend of falling below the normal value, placing them at a higher risk of developing chronic kidney disease. This suggests that while overall kidney function remained relatively stable, with disease progression being moderately controlled, continued attention is needed to preserve kidney function, particularly within the LAO PHC managed population.

Figure 5
Comparison of eGFR Test Results in Diabetic and Hypertensive Patients (2021-2024)



In summary, these results underscore the positive impact of healthcare decentralisation on expanding access to NCD care and increasing patient engagement in Tham Phannara district. However, they also reveal areas where further improvements are needed, particularly in standardising care quality and managing specific NCD indicators, like HbA1c and lipid levels, and preventing kidney function decline within the decentralised LAO PHC settings.

Discussions

The findings from this study shed light on the significant impact of healthcare decentralisation on the management of non-communicable diseases (NCDs) in Tham Phannara District, Thailand, between 2021 and 2024. The primary objective was to investigate the management of NCDs, specifically diabetes and hypertension, by examining patient demographics, healthcare service utilisation, and trends in annual health check-ups. Overall, the study demonstrates notable progress in expanding access to NCD care, while also highlighting areas requiring further attention to ensure consistent quality of care.

A sharp increase in the number of NCD screenings and services was a prominent finding, with medical check-ups rising from 254 in 2021 to 1,795 in 2024. This substantial growth indicates improved accessibility to healthcare and a greater engagement from the public in

managing their NCDs. This positive trend is particularly evident with the emergence of Local Administrative Organisation Primary Care Units (LAO PHCs) as crucial providers of NCD care. In 2024, LAO PHCs accounted for the highest volume of check-ups, facilitating 1,273 cases, which was significantly more than the main hospital (PCU) and Ministry of Public Health Primary Care Units (MOHP PHCs). The success of LAO PHCs is likely due to their stronger ties with the community, greater flexibility in managing resources, and an enhanced ability to deliver patient-centred care. This aligns with Thailand's Universal Health Coverage goals and suggests that decentralised systems can effectively address local health needs.

Analysis of patient demographics revealed that females constituted the majority of NCD patients at 67.60%, with an average age of 64.43 years. This reflects established gendered patterns in healthcare utilisation, particularly among older adults. Furthermore, hypertension was considerably more prevalent than diabetes, accounting for 69.70% of NCD cases compared to 30.30% for diabetes. This high prevalence of hypertension underscores the ongoing need for targeted interventions to manage cardiovascular risk factors within the district's aging population.

Regarding the quality of NCD management, measured through annual health examination laboratory results, the picture is mixed but generally positive with areas for improvement. For diabetes, the number of patients achieving desired fasting blood sugar (FBS) levels (< 100 mg/dL) increased, reaching 775 cases in 2024. Similarly, the number of patients with well-controlled glycated haemoglobin (HbA1c < 7.5%) also rose to 330 cases. While PCUs showed the best glycemic control in 2023, by 2024, LAO PHCs demonstrated optimal average FBS control. However, it is important to note that SHPH patients generally achieved better HbA1c control compared to LAO PHC patients, where over 30% of results were outliers, indicating inconsistent diabetes management in the decentralised units. This inconsistency highlights the urgent need for targeted improvement strategies within LAO PHCs.

In terms of lipid management, the number of patients with LDL cholesterol below 100 mg/dL improved, reaching 589 cases in 2024. In 2024, NPCU (MOHP PHC) showed optimal lipid management. Similar to diabetes control, SHPH patients demonstrated better lipid control with median LDL levels meeting the target. Conversely, LAO PHC patients exhibited a higher number of LDL outliers and greater variability, suggesting inconsistent lipid management and a potentially higher risk of cardiovascular disease in this group. Although total cholesterol levels remained generally within an acceptable range, the overall control trend showed a slight decline.

A concerning trend was observed in kidney function, where the number of individuals with estimated Glomerular Filtration Rate (eGFR) below 90 mL/min/1.73m² rose significantly to 696 cases in 2024. While kidney function remained relatively stable overall, the SHPH group maintained its eGFR within the normal range better than the LAO PHC group, which showed a tendency to fall below the normal value, increasing their risk of developing chronic kidney disease. This indicates that despite moderate control over disease progression, continuous attention is needed to preserve kidney function, especially within the LAO PHC managed patient.

While the study underscores the potential benefits of decentralisation in expanding primary healthcare access and improving NCD management, it also acknowledges several limitations. These include the study's reliance on data from a single hospital, which limits

generalisability, and the use of retrospective secondary data, which may lead to inconsistencies. The cross-sectional design also prevents establishing causality or tracking patient progress over time.

To sustain these gains and address existing challenges, future policy efforts should focus on strengthening the capacity of local health systems. This includes providing LAO PHCs with adequate training and resources, standardising care protocols, ensuring robust monitoring, and facilitating collaboration between the Provincial Administrative Organisation (PAO) and the Ministry of Public Health. Prioritising efficiency, equity, and quality in decentralised service delivery, with particular attention to high-burden conditions like hypertension, will be essential for improving patient outcomes.

Conclusion

Conclusion The study highlights that healthcare decentralisation has substantially increased non-communicable disease (NCD) screenings and services in Tham Phannara District. This clearly indicates improved access to healthcare and better NCD management. The emergence of Local Administrative Organisation Primary Care Units (LAO PHCs) as crucial providers demonstrates the success of this decentralised approach. Although diabetes and lipid control have shown progress, the high prevalence of hypertension requires targeted interventions, urging a focus on enhancing primary healthcare models for greater efficiency and equity, especially for hypertension patients.

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A Case for Restorative Practices as Strategic Transformation Efforts in Higher Education

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Abstract

Bellevue College, a mid-size institution near Seattle, Washington, established restorative practices across the campus to advance equity, trust, healing, and accountability for its staff, faculty, and students through the Office of Community Care & Institutional Transformation (OCCIT). Responding to issues of institutional trauma, community harm, oppression, and mistrust, OCCIT created a Director of Restorative Practices position to support the college's efforts in shifting the campus culture and climate while re-defining and re-enforcing its values through a restorative lens. OCCIT strategically integrated restorative practices across the college through proactive, responsive, and education-based initiatives. Data collected from participants of the restorative initiatives showed greater cross-campus community engagement and increased knowledge of restorative tools to navigate harm and address conflict. With the persistence of oppressive dynamics nationally, interpersonally, and within higher education, restorative practices offer a strategic path for transforming campus culture and climate.

Keywords: higher education, restorative practices, equity, community, repairing harm, case study

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Introduction

Higher education has faced mounting pressure to reckon with institutional harm, systemic inequities, and eroding trust among students, staff, and faculty. As campuses confront histories of exclusion, toxic workplace cultures, and unresolved conflict, many are searching for approaches that move beyond punitive responses and performative equity work. Restorative practices—rooted in Indigenous knowledge and relational frameworks—offer a powerful alternative: a community-centered strategy that fosters trust, accountability, and healing while reimagining how institutions engage with harm and (re)build culture.

At Bellevue College, a mid-size public institution located near Seattle, Washington, these challenges catalyzed the creation of a comprehensive, campus-wide restorative practices initiative. Launched through the Office of Community Care & Institutional Transformation (OCCIT), formally known as the Office of Diversity, Equity, and Inclusion (ODEI), this initiative recognized that fragmented or one-off interventions would be insufficient. Instead, OCCIT moved toward a systemic approach by establishing a Director of Restorative Practices and embedded restorative values across the college's policies, strategies, and teams.

This paper presents Bellevue College's integration of restorative practices as a strategic transformation effort—one that mobilized education-based offerings, proactive engagement, and responsive measures to address both historical and ongoing harm. Drawing on institutional data and community reflections, we explore how restorative practices have shifted the climate at Bellevue College and offer insights for higher education leaders seeking enduring, equity-driven cultural change.

Context and Background

Bellevue College (BC) is the largest open-access institution in Washington, enrolling approximately 20,000 students annually with credit-bearing and continuing education programs. The college serves a diverse student body—over 57% identify as students of color, and nearly 1,300 are international students. Many students at BC are working adults, parents, or first-generation college students navigating multiple life responsibilities alongside their academic goals. The average age of credit-seeking students is 26, with a median age of 21, and approximately 65% of students work while attending college.

In recent years, Bellevue College has experienced critical challenges related to campus climate, including fractured relationships among faculty and staff, institutional harm, and a culture of mistrust exacerbated by systemic inequities and unresolved conflict. In response to feedback from stakeholders across the college, the Vice President of OCCIT established the Director of Restorative Practices position and committed to embedding restorative approaches as a strategy to center equity, healing, and accountability. This shift was guided by Kezar's (2007) theory of institutionalization, which underscores the importance of aligning change efforts with organizational culture, leadership, and structural support to ensure sustainability and impact over time. Cultural transformation reorients power and disrupts white institutional presence (Grier, 2021). Bellevue College's approach positions restorative practices not merely as a tool, but as a praxis for cultural transformation—anchored in collective accountability and care-centered engagement.

By approaching restorative practices not as isolated interventions but as integrated and systemic strategies, Bellevue College seeks to advance meaningful institutional change. This manuscript outlines OCCIT's strategies, grounded in the college's evolving needs.

Restorative Practices in Higher Education

With origins from indigenous cultures worldwide, restorative practices encompass a framework for preventing and repairing harm through community building, trust restoration, active accountability, and inclusive decision-making (Karp, 2016). While some typically associate restorative practices with responsive interventions to harm, community building is the foremost restorative principle (Boyes-Watson et al., 2020), which focuses on proactive engagement, relationship building, and fostering authentic connections through storytelling and speaking one's truth beyond the surface. These proactive measures facilitate effectiveness and reduce the need for responsive measures to harm (Wachtel, 2016). It is not possible to restore trust where there was never any trust to begin with, so community building is a primary focus of restorative practices with an emphasis on proactive engagement before conflict surfaces. These relationship building efforts can also serve as a protocol that familiarizes the community with the depth of engagement that is called for in restoratively responding to harm.

Responding to Harm

In responding to harm, restorative practices focus on the root cause of the issues, uplifting the people harmed versus simply punishing the people who caused harm (Karp, 2004). Punishment does not necessarily heal what has been broken or prevent harm from reoccurring. Restorative practices take a holistic account for different types of harm: communal and relational harm, systemic and structural harm, physical and material harm, and emotional and psychological harm (Karp, 2016). Communal and relational harm involves situations of interpersonal conflict. Systemic and structural harm encompasses institutional harm and oppression. Physical and material harm includes damage or destruction of people or property. Emotional and psychological harm entails issues that may cause distress.

Active Accountability

Restorative practices call for people that cause harm to take active accountability for the various types of harm they cause. Active accountability requires people who caused harm to create plans to make things right, instead of waiting to be sanctioned or judged like in traditional notions of accountability (Karp, 2016). Punishment is central to dominant culture's notions of accountability that sanctions disciplinary action that is often unrelated to the harm or its cause and does not directly repair the harm (Mrowka, 2022). Active accountability, however, focuses on the issues and cause of the harm, centers those who are harmed, demonstrates an understanding of the harm and its significance, addresses the root cause of the harm, and draws attention to the framework that allowed for the harm to occur while working on rebuilding trust that is fractured through the harm (Karp, 2015). Focusing on the problem vs. the person who caused the harm is central to active accountability.

Restoring Trust

When harm occurs, a primary issue is often not exclusively about the harm itself, instead a focal problem is the material consequences of the harm, which is a breach in trust, especially

concerning harm between parties with pre-existing relationships before the conflict like friends or colleagues. The trust issues can be exacerbated when the relationship involves power dynamics like supervisors, mentors, professors, etc. Restoring trust is central to restorative approaches to harm (LaCroix, 2018) which involves rebuilding relationships so that those who caused harm can be trusted again and those who were harmed can feel safe again (Karp, 2015). Restoring trust is an iterative process that requires multiple attempts over time.

Inclusive Decision-Making

Finally, inclusive decision-making is a key restorative principle (LaCroix, 2018). Through careful facilitation, decisions are in the hands of those directly connected to the issues and harm. An inclusive decision-making process includes engagement from involved parties, asking what they believe is needed when there is an issue or before an issue arises. For example, a supervisor may consult with the team and community on access needs and equity issues before changing office hours. In response to harm, a trained facilitator would ask the person who caused the harm and the person who was harmed what they believe is needed to make things right. Outside of restorative spaces, the onus might be on those who were harmed to establish a task force or committee to call for change. In traditional notions of accountability, an external party, unrelated to the harm, may sanction the person who caused the harm (Wachtel, 2016).

Our Intervention

Grounded in the restorative principles of community building, restoring trust, active accountability, and inclusive decision-making to prevent and repair harm, Bellevue College's OCCIT implemented a strategy of integrating restorative practices across the campus to transform its culture. A three-pronged approach ensued: education-based offerings, proactive engagement, and responsive measures.

Education-Based Offerings

Drawing from Kezar's (2007) work on institutionalizing change, we utilized education-based offerings to mobilize the campus community around restorative practices**.** We started with informational interviews with campus leaders in key areas of conflict and community: staff and faculty affinity groups, Title IX, Dean of Students, Housing, Multicultural Services, Human Resources, Disability Resource Center, President's Office, Board of Trustees, and more. Each of these meetings highlighted the toxicity of the campus culture, which led to hosted workshops that introduced restorative practices across campus and provided restorative tools on navigating conflict. These tools demonstrate informal practices that do not require a trained facilitator, as these informal practices mitigate the need for and facilitate the effectiveness of formal restorative practices (Wachtel & McCold, 2001). The workshop: *Fostering Trust, Healing, & Accountability through Restorative Practices* was facilitated at several key events that required all faculty and staff to participate, like Campus Community Day and Equity Professional Development Day.

Infographics (Strange, 2025) on restorative responses to harm were introduced and made widely available to the campus as stand-alone reference and learning materials. Passive educational opportunities were important to increase access without requiring participants to have virtual or in-person time to train. The infographics include prompts that anyone can use,

not exclusively trained facilitators, to disrupt harm and cultivate accountability and repair. Another primary component of the education-based offerings includes consultations, spaces where students, staff, and faculty would meet with the Director to explore issues of power dynamics, trust building, accountability, classroom dynamics, community building, and other concerns in and outside of conflict. These consultations became a vital source of educating the campus community about restorative approaches to prepare them for the transformational changes ahead.

Proactive Engagement

Following Kezar's (2007) framework for institutional change, the second phase after mobilization is implementation. At Bellevue College, this phase emphasized proactive engagement as a core strategy for embedding restorative practices. Proactive efforts are essential for building a restorative culture and preventing harm before it occurs (LaCroix, 2018), making community-building outside of conflict a key priority.

One such initiative was *Restorative Drop-In Hours* at the Social Justice Center—an informal space where students, staff, and faculty could connect, decompress, and engage with restorative materials and upcoming events. Over time, these sessions also became a trusted space for brief consultations and real-time problem-solving rooted in restorative approaches.

The team also facilitated restorative circles on topics such as belonging, navigating change, and accountability. These equity-centered spaces invite participants to reflect and listen deeply in community, using structured prompts to support relational connection (Wachtel & McCold, 2001). One particularly impactful offering was *Navigating Team Dynamics*, an interactive session developed in response to widespread concerns about power and workplace relationships. Participants explored their communication styles, conflict orientations, and shared needs. This activity has since been integrated into campus-wide training and division retreats to support healthier team dynamics.

Proactive engagement remains central to this work—not just to reduce harm, but to transform culture through intentional connection and sustained practice.

Responsive Measures

The third component of our three-pronged approach to institutionalizing restorative practices at Bellevue College is responsive engagement. Designed to meet the campus' evolving needs, these measures provided support in moments of tension, conflict, and uncertainty.

In response to specific concerns from faculty, we launched *Restorative Hours for Faculty*—a weekly drop-in space for faculty to seek consultation on restorative approaches to classroom dynamics and department relationships.

During the 2024 presidential election season, the college experienced heightened stress, bias complaints, and an increase in CARE reports – online referral forms to document concerns about health, wellness, and other incidents. In anticipation of these impacts, OCCIT hosted *Post-Election Restorative Listening Circles*—one for students and one for faculty and staff. These optional, equity-centered spaces allowed participants to be in community while processing the election's emotional and social toll and reflect on their needs. The circles were

co-sponsored by the Associated Student Government and the Counseling Center and promoted in partnership with the Provost's Office to ensure visibility and structural support.

Following the circles, participants requested continued support through a *Post-Inauguration Healing Space*. In response, OCCIT offered drop-in decompression spaces centered on somatic healing. These included massage therapy, sound baths, and low-sensory environments hosted in the Social Justice Center, providing comfort and restoration during a period of widespread anxiety and fear.

Responsive engagement has been essential to our campus-wide strategy. These efforts addressed immediate needs while modeling restorative values of trust and care.

Partnerships

This restorative work would not be effective or sustainable if it were done in isolation. In moving from implementation toward institutionalization (Kezar, 2007), we established restorative teams to support the cultural shifts across the college. We started by creating a restorative advisory board known as the Restorative Dream Team, staff and faculty from key areas across campus who help to (re)imagine restorative possibilities for the college. Then, we established a group of restorative staff, faculty, and community facilitators who would host restorative circles, trainings, and activities across the campus. The restorative facilitators participate in a three-day restorative circle training process where they learn the model and build the community amongst themselves that we aspire to see across the entire campus. Each year, we expand the restorative facilitator cohort, training new facilitators and hosting a monthly community of practice for facilitators to (re)connect with each other for mini training and modeling. Given unique concerns with faculty, in the second year after hiring the Director, we also hired Restorative Faculty Fellows to integrate restorative circles in academic affairs and support faculty with restorative approaches in their classroom and team dynamics. Establishing restorative teams across the college was not only central to the three-pronged strategy of integrating restorative practices across the college, our restorative teams helped to make restorative practices a part of the values, norms, and culture of the college.

"If systems are not inherently restorative, they cannot hope to affect change through an occasional restorative intervention. Restorative practices must be systemic, not simply situational" (Wachtel & McCold, 2001). Overall, our strategic approach to integrate restorative practices across the college centered systemic efforts that included key stakeholders throughout the campus for proactive, responsive, and education-based engagement.

Outcomes and Impact

After applying our three-pronged approach to transforming the campus climate with restorative practices, we found great quantitative and qualitative impact from our restorative approaches. Below, we describe the outcomes and impact of each of the three prongs of our intervention.

Educational Impact

We conducted over 137 hours of training across 1,265 participants which included 13 campus-wide trainings, 11 internal facilitator trainings, and 8 multi-day external trainings.

Specifically, our introduction to restorative practices workshop, *Fostering Trust, Healing, & Accountability through Restorative Practices* reached over 150 participants and 98% of participants agreed that as result of the training, they learned at least one tool they can use to respond to harm. As an extension of our training and its own standalone resource, faculty and staff display our restorative infographics in their spaces across the college, including the President's Office highlighting its restorative tools to respond to harm and uplifting positive impact. In a restorative gathering, a staff member in Human Resources remarked, "I use the infographics in my intake meetings and they are very helpful!" With the pervasiveness of harm between faculty and staff, it was vital to structurally integrate restorative practices into the ways Human Resources respond to conflict. The aforementioned restorative infographic, *Restorative Response Cards*, provide tools for cultivating active accountability amongst those who cause harm and empathy for those who were harmed, all while demonstrating restorative responses that support positive impact for proactive engagement. Regarding consultations, OCCIT found that they were particularly useful for faculty and team leaders that needed support navigating classroom dynamics involving oppressive comments and power dynamics within their academic teams. Leaders across campus sought restorative consultation to educate themselves on restorative strategies to prevent and repair conflict in their spheres of influence. Given the pervasiveness of perceived mistrust and toxicity on campus; educational engagement was transformational.

Proactive Impact

While continuing to advance our education-based offerings, the restorative impact of proactive engagement was also notable. With quarterly Restorative Drop-In Hours, participants were able to casually learn about and experience our restorative efforts. More formally, we hosted a variety of restorative circles to bring the campus community together in more authentic ways, resulting in participants saying "it felt like the community I needed." Another participant remarked, "you can feel the energy shift after a circle." As one participant simply stated, our restorative circles are "transformative." Breaking silos across the campus and building a culture of trust, these proactive interventions established restorative values as a new norm throughout the college. Alongside circles, OCCIT hosted restorative activities for various teams and divisions across campus, especially during faculty retreats. Specifically, after the *Navigating Team Dynamics* activity, one participant raved, "people are now talking to each other who were not on speaking terms!" Another participant responded that because of the activity, "[our academic division] learned better ways to work together… our meetings look and feel different." Cultural change is difficult to measure, but the feedback from these restorative activities demonstrates the transformational power of this proactive engagement.

Responsive Impact

The impact of our responsive measures was also striking. Most notably, 100% of participants of the campus-wide Post-Election Restorative Listening Circles indicated that the model was an effective strategy to listen and be heard on important issues and would recommend a restorative listening circle to others. In another restorative listening circle, a participant reported, "I felt seen and safe, heard and supported." The restorative listening circle is a strategically responsive model that OCCIT utilizes to reinforce restorative values of trust, empathy, and active accountability in giving campus communities a space to share, grieve, and process generalized harms.

Overall Impact

While transformation can be difficult to measure and trace its exact roots, participants of our restorative initiatives have provided astounding reflections on the impact of the work. The transformation was expressed by a campus leader's remarks on our restorative efforts to address the toxicity of the climate, "the campus feels different." A faculty member vulnerably shared, "before participating in restorative programs, honestly, I was going to leave the college." Finally, a campus administrator who was originally skeptical of restorative work admitted, "to be honest, the main benefit was healing. I had felt so discouraged and disconnected with the college before this [process]. This experience has allowed me to feel welcomed again and like I do belong. It was great spending time with such wonderful people." Beyond any individual restorative program assessment results, our restorative approaches overall have transformed many aspects of the campus, supported employee retention, and cultivated a culture of profound community connection for those who have participated.

Analysis and Reflections

We learned a lot over three years of integrating restorative practices across the college. Our three-pronged approach of education-based, proactive, and responsive initiatives has been vital to making the restorative efforts sustainable and systemic. While much of the campus wanted to focus exclusively on responsive measures, the focus on proactive engagement proved to establish community building values that were necessary for effective responsive measures. Developing restorative teams and stakeholders was also critical to making the work sustainable. Early on, we found that a focus on staff and faculty was necessary, given the pervasiveness of the toxic culture they were seeking to address amongst themselves. In the third year, after our restorative approaches were more established, we expanded our focus to include direct student support. Moving forward, we plan to establish a restorative peer facilitator cohort for affinity group student leaders to learn restorative circle processes for their cultural organizations and constituents.

With our proactive engagement, Restorative Drop-In Hours were primarily successful in the first year, then over time, attendance began to decline. We also found that drop-in hours require a cultural shift around time. With multiple competing priorities, people at the college struggle with prioritizing rest and restoration. Given the decline in participation, we transitioned our restorative programs to be offered by request or emergent need. One of the most consistent restorative requests was *Navigating Team Dynamics* for faculty retreats for each of the academic divisions across the college. Participants across academic affairs continue to remark on the transformative power of the session. A major component of the success of this activity was that it serves as an accessible way to bring restorative practices to large groups of the campus community who are already together. People who were not necessarily invested in restorative practices before the session would comment that they are deeply connected and invigorated by the end of the session.

The education-based offerings proved to mobilize the campus around restorative practices and train the community on restorative tools to navigate harm. Hosting the introductory workshop during campus-wide professional development opportunities was most effective for engagement and like Restorative Drop-in Hours, hosting the workshop on its own did not draw many participants after the first year. We found that once the campus was initially exposed to restorative practices in the original year, formal introductory training was no

longer necessary. On the other hand, the infographics were widely successful and took on a life of their own with much of the campus highlighting and utilizing its restorative tools. Next, we will post video clips on our website explaining the infographics to provide more context for those who have not attended the trainings. So far, restorative consultations have been by request, and OCCIT is planning to establish a process that allows restorative teams to come to departments and team meetings instead of relying on those units to come to us. Given the newness of restorative practices across the college, we recognize there can be access and knowledge barriers that prevent departments from reaching out to us.

Our responsive measures were the newest to evolve. For the first two years, the primary focus was building the proactive and education-based initiatives to mobilize the campus around restorative practices in an effort to make responsive measures more effective. While we have successful responsive models like Restorative Listening Circles, our next step is to establish a restorative justice conference process across the college's Human Resources, Title IX, Conduct, and bias report processes. A restorative justice conference is a model to repair harm that unites all parties involved to process the harm, impact, and collectively decide what is needed to move forward (Karp, 2016). While a restorative justice conference is an option in intake forms across the college, participants opt for other options, likely because they are unfamiliar with this restorative approach. Moving forward, we will create educational campaigns about restorative practices while advancing proactive and responsive interventions.

Conclusion and Implications for Practice

For other college campuses seeking to transform their culture and climate utilizing restorative practices, we recommend educating the entire campus community on restorative practices and its benefits. This can help to debunk myths and process any resistance. Mobilizing efforts are most effective before hiring and implementing any changes because they prepare the campus for what is ahead and includes them in the transition. Mobilizing campus leaders including the Office of the President and Board of Trustees is strategic for budget needs and structural support, which allowed us to grow our programs and expand our reach because they understood the stakes, potential, and what is needed for the shared goal of cultural transformation. Overall, before implementing any restorative interventions, we recommend the campus community have an adequate understanding of restorative practices and potential.

The importance of beginning with and continuing to reinforce proactive restorative practices outside of conflict cannot be overstated. With a hostile campus climate, there may be pressure to directly start with exclusively responsive measures to address the pervasiveness of harm. Unfortunately, this pressure could lead higher education professionals into serving as restorative police, re-inventing harmful systems that are antithetical to restorative values. While it takes more time, as true culture-changing initiatives do, focusing on proactive and community building efforts is the most effective and sustainable strategy that will actually make future responsive measures more successful. Similarly, an overreliance on formal restorative practices like circles and conferences can also be limiting. In essence, restorative practices is a relationship-building framework centering empathy, it can be isolating for the campus community to feel like only trained facilitators utilizing structured and scripted processes can be restorative. Informal restorative practices can include affective questions and dialogue that cultivate shared vulnerability that is often utilized in formal restorative practices. Additionally, culture transformation requires expansive thinking on programmatic offerings beyond restorative circles. We found such transformative impacts in our healing

spaces that included somatic processing, sound baths, massage therapy, and quiet reflection. Culture change requires going against the status quo of traditional higher education program design.

In designing restorative initiatives, we recommend higher education professionals consider the structure of programs over time. We found drop-in hours to be more productive in the first year, scheduled programs were successful in the second year, and transitioning to primarily offer requested support and respond to emergent needs was effective in the third year. It is vital that higher education professionals consider the unique needs of the campus given its culture and growing relationship to restorative practices. Similarly, it is helpful to consider the accessibility of in-person vs. virtual offerings and synchronous vs. asynchronous offerings while maintaining the integrity of the work. We found that in-person is the best option for restorative circles while select educational offerings are most accessible as a virtual or even asynchronous option. For example, displaying our restorative infographics on our website has proven to attract engagement and use across campus, supplementing the infographics with brief video clip explanations and suggestions for consideration might be even more effective.

Building restorative teams is crucial to making the work more sustainable and establishing restorative practices across the campus so that it is not exclusively dependent on one person or office. Restorative teams can spread the impact of the work in subtle ways that we found attracts more engagement. Building teams to implement the work leads to restorative practices becoming a part of the culture rather than it exclusively being known as a part of the office that houses it. We recommend establishing restorative teams with representation in departments with high impact, community building areas with potential to advance restorative practices. Restorative teams may serve different functions. We found an advisory board was central to consulting on which restorative practices were best to implement given campus needs. We found restorative facilitators were essential to implementing restorative practices across the college. To meet the unique needs of faculty academic departments, we found that establishing a restorative faculty fellowship was necessary. While each restorative team may serve a distinct purpose, to maintain the integrity of the work, it is important that the teams are built around restorative values and not rigidly prescriptive about their role. For example, while the primary function of the restorative facilitators is to implement restorative practices across the college, we found in their creation of the community of practice, the restorative facilitator cohorts took on a life of their own, a community building network with and for each other. In its first year, staff and faculty were desperate to be invited despite the overwhelming campus work culture of burnout and silos. Building teams that are restorative by nature creates its own transformative potential.

Transformation is an iterative process that unfolds over time. To be effective, it must be approached with strategic planning—avoiding the temptation to implement everything all at once. In our first year, we focused on building restorative foundations and cultivating restorative teams. The second year emphasized the integration of sustainable restorative models into the fabric of the college. By the third year, our efforts expanded to include deeper engagement with students and collaboration with other colleges. Much like the trust required in early relationship building, culture change also evolves in stages. When thoughtfully planned, the integration of restorative practices across a college campus can lead to lasting, systemic impact.

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A Cross-Sectional Study of Stroke Hospitalization Costs in Secondary Care: Evidence From Southern Thailand (2019-2023)

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Abstract

Background: Stroke represents a significant global health burden with escalating incidence rates and healthcare costs. This study analyzes hospitalization costs for stroke patients from both healthcare provider and payer perspectives to inform resource allocation and enhance system efficiency.
Methods: This cross-sectional study examined data from 7,932 stroke patients (ICD-10 codes I60-I69) treated at Songkhla Hospital, Thailand (2019-2023). Analysis included inpatient costs across stroke types, readmission rates, and costs under different Universal Health Coverage schemes using SPSS version 17.
Results: The cohort comprised predominantly males (57.07%), with mean age 64.70 years and median hospital stay of 3 days (IQR: 2–5 days). Ischemic stroke constituted 79.84% of cases, with Universal Coverage Scheme covering 75.57% of patients. Patient volume increased by 23.04% over the study period, with 5.14% one-year readmission rate. Total treatment costs reached USD 6.09 million (THB 198,230,040), with a mean of USD 725 (THB 23,624) per year. Hemorrhagic stroke costs exceeded ischemic stroke by USD 454 (THB 14,802) annually. First-time median costs were USD 342 (THB 11,152) for ischemic and USD 658 (THB 21,451) for hemorrhagic strokes. Diagnosis-Related Groups (DRG) reimbursements were consistently lower than accounting costs, particularly for extended hospitalizations.
Conclusion: Findings demonstrate substantial cost variations between stroke types and payment mechanisms, highlighting the need for DRG system refinement to better reflect actual care costs.

Keywords: hospitalization costs, stroke, Thailand, health economics

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Introduction

Stroke is a condition in which the brain is deprived of blood supply due to the rupture, narrowing, or blockage of blood vessels, resulting in the death of brain cells (Kuriakose & Xiao, 2020; Sacco et al., 2013). It is a major public health issue worldwide, with increasing trends in both morbidity and mortality rates each year (Feigin et al., 2025; Xu et al., 2024). Stroke survivors often suffer from residual disabilities and are at high risk of recurrence and hospital readmission) (Bjerkreim et al., 2019; Lin et al., 2011; Zhou et al., 2023). Additionally, stroke care imposes a substantial economic burden due to the long recovery periods and the need for close and continuous patient care (Kuptniratsaikul et al., 2013; Lucas-Noll et al., 2023; Ma et al., 2024; Rochmah et al., 2021).

Songkhla Hospital is a secondary care facility that serves as a referral center for stroke and neurological care for eight community hospitals within its network: Ranot Hospital, Krasae Sin Hospital, Sathing Phra Hospital, Singhanakhon Hospital, Mueang Songkhla Hospital, Thepha Hospital, Chana Hospital, and Saba Yoi Hospital. The hospital provides comprehensive, standardized care throughout the patient journey before arrival at the hospital, during inpatient treatment, and after discharge. Treatment is tailored to each patient's health condition and stroke severity.

This study was aimed to examine the inpatient (IPD) hospitalization costs of stroke patients admitted to Songkhla Hospital from walked-in or referred from community hospitals in its network. The findings will be valuable for planning and managing resources for stroke care and will contribute to optimizing healthcare resource utilization.

Method

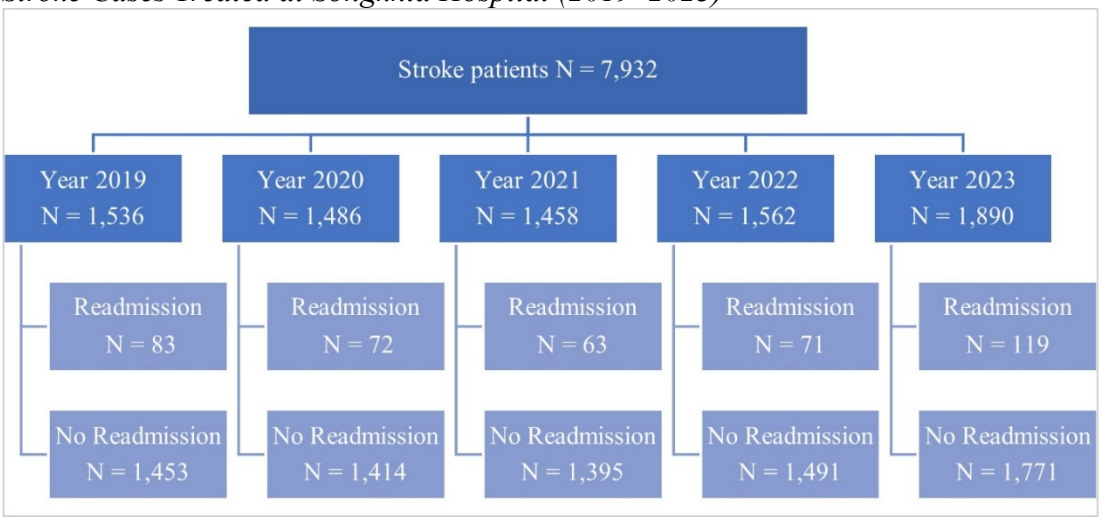
This study employed a cross-sectional descriptive design using inpatient medical records of stroke patients documented in the hospital information system of Songkhla Hospital and referred from eight community hospitals between 2019 and 2023. Inclusion criteria comprised patients diagnosed with stroke (ICD-10 codes I60–I69) by a physician and admitted to Songkhla Hospital. Records with incomplete or missing data were excluded. A total of 7,932 cases were included (Figure 1). Data were obtained through a retrospective review of inpatient medical records and was used for comparing healthcare costs between initial hospitalizations and subsequent readmissions.

The analysis examined initial hospitalization cost (first admission) and repeated hospitalization cost (subsequent admissions), categorized by stroke type (ischemic or hemorrhagic). Costs were described from healthcare provider and healthcare payer perspectives. Two cost perspectives were assessed (1) accounting costs (actual expenses incurred by the hospital) and (2) Diagnosis Related Group (DRG) costs (reimbursements received under different insurance schemes). Cost data were further analyzed by length of stay and type of healthcare coverage under Thailand's Universal Health Coverage (UHC) system, three main schemes (1) Civil Servant Medical Benefit Scheme (CSMBS), (2) Social Security Scheme (SSS), and (3) Universal Coverage Scheme (UCS).

Descriptive statistics were used to analyze demographic and clinical characteristics, including gender, mean age, average length of stay, marital status, religion, stroke type, insurance coverage, and hospitalization details. Data analysis was performed using SPSS version 17, and results were presented as frequencies, percentages, means, and standard deviations.

Ethical approval for the study was obtained from the Human Research Ethics Committees of Thaksin University (COA No. TSU 2024_134, REC No. 0346) and Songkhla Hospital (SKH IRB 2024-Edu-On3-1077).

Figure 1
Stroke Cases Treated at Songkhla Hospital (2019–2023)



Between 2019 and 2023, a total of 7,932 stroke patients were admitted to Songkhla Hospital (Figure 1). Among these, 408 patients (5.14%) experienced hospital readmission for stroke treatment, whereas 7,524 patients (94.86%) had no readmission.

Result

Table 1
Characteristics of Stroke Patients at Songkhla Hospital (2019–2023)

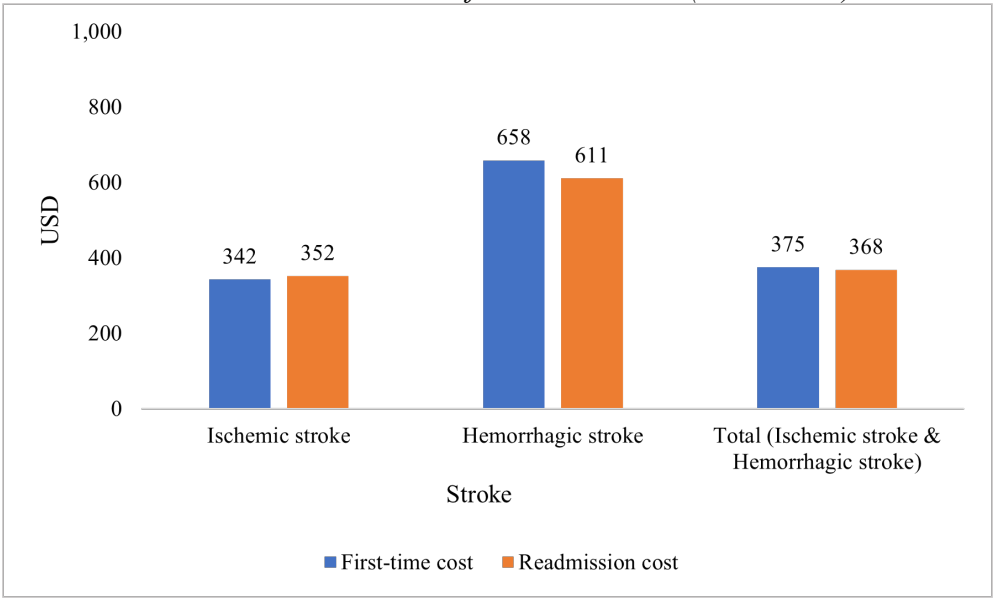
Variable	Number of patient	Percentage
Gender		
Male	4,527	57.07
Female	3,405	42.93
Marital status		
Single	1,092	13.77
Married	6,488	81.80
Widowed	135	1.70
Divorced	190	2.40
Other	27	0.34
Religion		
Buddhism	6,111	77.04
Islam	1,817	22.91
Christianity	4	0.05
Patient type		
Ischemic stroke	6,333	79.84
Hemorrhagic stroke	1,599	20.16

Health benefit scheme and payment methods		
Universal Coverage Scheme (UCS)	5,994	75.57
Social Security Scheme (SSS)	404	5.09
Civil Servant Medical Benefit Scheme (CSMBS)	1,384	17.45
Out-of-pocket payment	129	1.63
Health Insurance for Foreign Workers	21	0.26
Type of hospital admission		
Walked-in	3,746	47.23
Referral (within network)	3,976	50.12
Referral (outside network)	210	2.65

The mean age of patients was 64.70 years (SD = 14.33).
The median length of hospital stay among stroke patients was 3 days (IQR: 2–5 days).

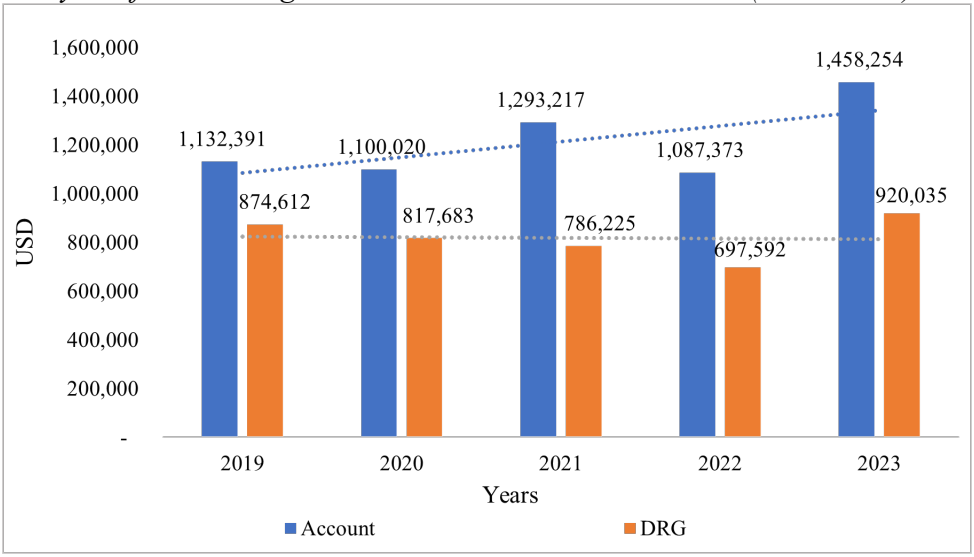
Based on the data presented in Table 1, the majority of stroke patients were male (4,527 cases, 57.07%), Buddhist (6,111 cases, 77.04%), and married (6,488 cases, 81.80%). Most patients were diagnosed with ischemic stroke (6,333 cases, 79.84%), with a mean age of 64.70 years (SD = 14.33). The median length of hospital stay was 3 days (IQR: 2–5 days). Approximately half of the patients (3,976 cases, 50.12%) were referred from affiliated community hospitals, and most were covered by the Universal Coverage Scheme (UCS) (5,994 cases, 75.57%).

Figure 2
First-Time and Readmission Costs of Stroke Patients (2019–2023)



As shown in Figure 2, there was no statistically significant difference in treatment costs between patients admitted for their first stroke episode and those readmitted for subsequent care. On average, the cost of treating hemorrhagic stroke was USD 454 (THB 14,802) higher than that of ischemic stroke. The mean initial treatment cost for hemorrhagic stroke was USD 658 (THB 21,451), compared to USD 342 (THB 11,152) for ischemic stroke.

Figure 3
Analysis of Accounting and DRG Costs in Stroke Patients (2019–2023)



As illustrated in Figure 3, over the five-year period from 2019 to 2023, Songkhla Hospital spent approximately USD 6.09 million (THB 198,230,040) on stroke patient care. However, the hospital received only about USD 4.09 million (THB 133,295,779) in reimbursements under the Diagnosis Related Groups (DRG) system. This resulted in a cost deficit of approximately USD 1.99 million (THB 64,934,262). It represented financial shortfall of around 32.76%.

Furthermore, the cost gap has shown a consistent upward trend. In 2019, the deficit was USD 257,778 (THB 7,936,149), which increased to USD 538,218 (THB 18,593,930) by 2023 (Figure 3). This trend reflects the hospital's growing financial burden, which may be attributed to rising treatment costs or to DRG reimbursement rates that do not align with actual expenditures.

These findings (2019-2023) highlight a persistent imbalance between actual accounting costs and DRG-based reimbursement. Without targeted reforms or additional financial support, such discrepancies could threaten the long-term financial sustainability of secondary care hospitals.

Table 2
Comparison of Accounting Cost and DRG by Length of Stay (≤ 5 vs. ≥ 6 days) in Stroke Patients

Los	Accounting cost (USD)		DRG (USD)	
	Median	IQR	Median	IQR
≤ 5 Days	327	262–469	293	290–403
Ischemic stroke	317	258–431	293	290–379
Hemorrhagic stroke	455	317–673	428	290–554
≥ 6 Days	1,215	711–2,129	581	381–1,286
Ischemic stroke	1,127	630 –2,001	571	302–1,286
Hemorrhagic stroke	1,288	827–2,422	767	532–1,343

As presented in Table 2, accounting costs exceeded DRG-based reimbursements across all categories of stroke patients, with particularly pronounced differences observed among those with hospital stays longer than six days. The disparity between actual costs and reimbursement amounts tended to increase with the length of hospitalization. Specifically, stroke patients who were hospitalized for more than six days incurred a median accounting cost of USD 1,215 (THB 39,572), while the corresponding DRG reimbursement was only USD 581 (THB 18,939). This finding highlights a structural imbalance in the reimbursement system, particularly for cases requiring prolonged and complex care.

Additionally, patients with hemorrhagic stroke consistently incurred higher treatment costs than those with ischemic stroke, in terms of both accounting costs and DRG reimbursements (Table 2). This pattern was observed regardless of the length of stay ($\leq$ 5 days or $\geq$ 6 days), reflecting the increased cost burden faced by hospitals in managing patients with more severe clinical presentations.

Table 3

Comparison of Accounting and DRG Costs by Health Scheme (2019–2023)

Health benefit scheme	Patient Stroke N (%)	Accounting (USD)	DRG (USD)	% Different*
Universal Coverage Scheme (UCS)	5,994 (75.57%)	375	293	-21.92%
Social Security Scheme (SSS)	404 (5.09%)	360	23	-93.64%
Civil Servant Medical Benefit Scheme (CSMBS)	1,384 (17.45%)	378	459	+21.38%
Out-of-pocket payment	129 (1.63%)	376	-	0.00%
Health Insurance for Foreign Workers	21 (0.26%)	390	293	-24.97%

Note * Loss (-) and profit (+)

As shown in Table 3, the average accounting cost of stroke care was relatively consistent across Thailand's major health insurance schemes (USD 360-390 or THB 11,730-12,706), reflecting a uniform standard of care. However, DRG-based reimbursements varied considerably.

Only the Civil Servant Medical Benefit Scheme (CSMBS) provided reimbursements exceeding actual costs, with a 21.38% surplus (USD 81 or THB 2,631). In contrast, the Social Security Scheme (SSS) had the largest deficit, covering only 6.36% of actual costs (USD 23 or THB 746), resulting in a shortfall of 93.64% (USD 337 or THB 10,984). Similarly, the Universal Coverage Scheme (UCS) and migrant worker insurance schemes also provided reimbursements below actual costs, with UCS patients facing an average deficit of 21.92% (USD 82 or THB 2,677).

Uninsured patients received no DRG-based reimbursement and were responsible for the full cost of care (Out-of-pocket).

These finding underscore structural disparities in the reimbursement systems, which destabilized the financial sustainability of public hospitals-particularly those operating under tight budget constraints.

Discussion

This study assessed the economic burden of stroke care at a secondary-level hospital in Southern Thailand by analyzing actual accounting costs, Diagnosis Related Group (DRG)-based reimbursements, and variations across different health insurance schemes using data from 2019 to 2023.

The findings revealed no significant difference in treatment costs between initial admissions and readmissions for stroke care. However, hemorrhagic stroke cases consistently incurred significantly higher costs than ischemic stroke cases, reflecting the greater resource requirements associated with more severe clinical presentations.

Over the five-year period, the hospital spent approximately USD 6.09 million on stroke patient care but received only USD 4.09 million in DRG-based reimbursements-resulting in a cumulative shortfall of around USD 1.99 million, or 32.76% of total costs. This deficit exhibited a rising trend each year, highlighting the increasing financial strain on secondary care hospitals.

This study found that reimbursement discrepancies across health insurance schemes. The Civil Servant Medical Benefit Scheme (CSMBS) was the only scheme that provided reimbursements exceeding actual costs (a 21.38% surplus), while the Social Security Scheme (SSS) offered the lowest coverage-only 6.36% of costs (USD 23 per case), resulted in 93.64% shortfall. Patients under the Universal Coverage Scheme (UCS) also faced reimbursement gaps, while uninsured patients bore the full cost out of pocket.

Cost disparities were more pronounced in cases involving extended hospital stays. Patients hospitalized for six days or more incurred median costs of USD 1,215, while corresponding DRG reimbursements averaged just USD 581. The gap was especially substantial in hemorrhagic stroke cases, indicating a structural imbalance in the reimbursement model for complex or prolonged hospitalizations.

Limitations

This study was conducted using retrospective data from one secondary hospital, which may limit the generalizability of the findings to other healthcare settings. Additionally, the analysis focused exclusively on direct accounting costs and did not capture indirect costs such as loss of productivity among caregivers or long-term disability-related expenses, which are also relevant when evaluating the broader economic impact of stroke.

Policy Implications and Recommendations

The findings suggest that current DRG reimbursement rates do not adequately reflect the actual costs incurred in stroke care, particularly in secondary-level hospitals operating under budget constraints. To address this, policymakers should consider revising the DRG payment structure to more accurately represent real treatment expenses for each type of health benefit scheme especially SSS and UCS. Furthermore, public hospitals that provide care for complex

or prolonged stroke cases should be supported through additional budget allocations or targeted financial mechanisms to maintain service quality and institutional sustainability. Broader research involving multiple hospitals and levels of care is also recommended to capture national trends and guide more equitable health financing policies.

Conclusion

This study highlights significant structural imbalances in Thailand's hospital reimbursement system for stroke care. The persistent gap between actual treatment costs and DRG-based reimbursements-particularly among patients with severe conditions, longer hospital stays, or underfunded insurance schemes-may threaten the financial sustainability of secondary public hospitals. Without targeted policy reforms or financial support mechanisms, these discrepancies could compromise equitable and sustainable access to essential stroke care services.

Acknowledgements

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The Development of Online Learning Modules Integrating Artificial Intelligence and Active Learning Models in the Language and Digital Technology for Innovation Development Courses

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Abstract

The objectives of this research were: (1) to develop and evaluate the efficiency of online learning modules integrating Artificial Intelligence (AI) and the Active Learning Model for the course "Language and Digital Technology for Innovation Development" in the Bachelor of Education Program, Faculty of Education, Naresuan University; (2) to compare students' learning achievement before and after using the AI-integrated online modules; and (3) to examine students' satisfaction with learning through the developed modules. The research instruments included the online learning modules, learning achievement tests, and a student satisfaction questionnaire. The study followed the ADDIE Model (Analysis, Design, Development, Implementation, and Evaluation). Key findings revealed that: (1) the developed online learning modules achieved an efficiency level of 87.44/86.25, exceeding the established criteria of 80/80; (2) students' post-test achievement scores were significantly higher than their pre-test scores at the .05 level of significance; and (3) student satisfaction with the learning experience was at a high level ($\bar{x}$ = 4.16).

Keywords: online learning, artificial intelligence, active learning

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Introduction

Educational management in Thailand adheres to the National Education Act B.E. 2542 (1999) as amended in B.E. 2545 (2002), which emphasizes that all learners are capable of learning and self-development, with learners positioned at the center of the educational process. Learning should therefore promote individual development in accordance with natural potential (Office of the National Education Commission, 2002).

Education reform focuses on learner-centered approaches. Teachers must shift from traditional, rote-based instruction to methods that encourage students to think and engage in real-world practice, thereby enabling them to construct knowledge independently. Teachers should create engaging scenarios, spark curiosity, and motivate students to learn. Consequently, the teacher's role transforms from knowledge provider to facilitator and mentor, supporting student success.

Traditional teaching methods often lead to student disengagement. Therefore, educators need to redesign teaching strategies that are engaging and participatory, fostering skills such as inquiry, problem-solving, and critical thinking.

Artificial Intelligence (AI) refers to technology that enables machines to exhibit human-like intelligence, including reasoning, decision-making, and learning. The core of AI lies in Machine Learning (ML), a discipline that allows machines to autonomously analyze relationships between input data and generate appropriate responses without manual programming. ML employs advanced mathematics, statistics, data management, and programming to construct predictive models that adapt to new data inputs.

In education, AI helps reduce teachers' workload in areas such as assessment, registration, and administration. It enhances accuracy and efficiency; for instance, AI-based tools can quickly and precisely grade multiple-choice exams. Additionally, AI supports tasks like scheduling, grade calculation, and record management.

AI can also assist in developing educational content and instructional media, facilitating learning anywhere, beyond traditional classrooms. It evaluates learners' progress and recommends suitable learning materials. AI supports teachers in lesson creation, student data analysis, resource searching, and producing e-books. In the future, AI could serve as a virtual instructor, with teachers acting as AI supervisors who input data and oversee learning delivery. This could enhance teaching scalability and variety (True Plookpanya, 2024).

The integration of AI in education supports autonomous learning, particularly in subjects requiring specialized instruction. AI contributes to personalized curriculum design, accurate assessment, and creative learning experiences that make lessons more engaging (Siamphone, 2024).

Active Learning

Active Learning refers to a teaching approach where students engage in hands-on learning and reflective thinking (Bonwell & Eison, 1991. It fosters cognitive development, including critical thinking, problem-solving, and knowledge application.

This approach encourages learner participation in curriculum design, knowledge construction, collaboration, and mutual responsibility. Activities focus on high-order thinking skills such as analysis, synthesis, and evaluation. Teachers act as facilitators and mentors, guiding learners to engage through experiences and practical application.

Students should participate in varied activities beyond passive listening—such as reading, writing, discussion, and problem-solving—to create deep, meaningful learning. Active Learning is grounded in two key assumptions:

1. Learning is a natural human endeavor, and
2. Individuals learn differently (Prince, 2004).

Students evolve from passive recipients to active co-creators of knowledge (Felder & Brent, 1996). Through interactive learning experiences, they develop deeper understanding, apply knowledge in innovative ways, and enhance essential skills such as communication and collaboration. Research has shown that Active Learning strategies—such as academic presentations, simulations, and real-world applications—can improve learning outcomes by up to 70%, with some methods yielding retention rates as high as 90% (Freeman et al., 2014; National Training Laboratories, 2001).

Research Objectives

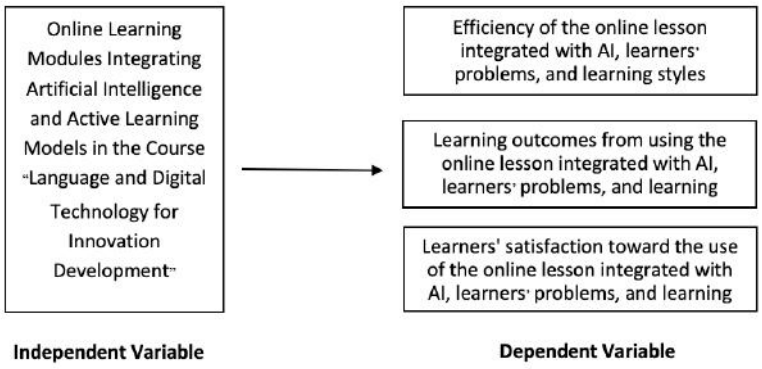
1. To develop and evaluate the efficiency of online learning modules integrating AI and the Active Learning Model for the course "Language and Digital Technology for Innovation Development" in the Bachelor of Education Program, Faculty of Education, Naresuan University.
2. To enhance students' learning achievement before and after using the AI-integrated Active Learning modules.
3. To assess student satisfaction with learning via the developed modules.

Research Hypotheses

1. The developed online learning modules integrating AI and the Active Learning Model will meet the efficiency criteria of E1/E2 at a standard of 80/80.
2. Students' post-learning achievement will be significantly higher than pre-learning achievement at the .05 level of significance.
3. Students will report a high level of satisfaction with the online learning modules.

Conceptual Framework

Figure 1
Research Framework



Population and Sample

The population consisted of 120 undergraduate students enrolled in the Bachelor of Education program, majoring in Computer Education and Educational Technology and Communication, who registered for the course "Language and Digital Technology for Innovation Development" in the academic year 2025.

Research Procedures

The research was conducted in the following three phases:

Phase 1: Development and evaluation of the efficiency of an online lesson integrated with artificial intelligence (AI) tools and an active learning approach in the course Language and Digital Technology for Innovation Development.

Phase 2: Development of students' learning achievement before and after instruction using the online lesson integrated with AI tools and an active learning approach.

Phase 3: Assessment of students' satisfaction toward learning with the online lesson integrated with AI tools and an active learning approach.

Phase 1: Development and Evaluation of the Efficiency of the Online Lesson Integrated With Artificial Intelligence and Active Learning

Data Sources

Population: Third-year undergraduate students in the Bachelor of Education program, Faculty of Education, Naresuan University, who enrolled in the course Language and Digital Technology for Innovation Development.

Sample Group: Third-year students majoring in Educational Technology and Communication, Faculty of Education, Naresuan University, who were selected through purposive sampling

Content Scope: The course Language and Digital Technology for Innovation Development covers the following topics:

- Selection, utilization, and skills in using digital media, technology, and innovations for learning.
- Design and production of digital media and innovations for learning.
- Evaluation of digital media and innovations for learning.

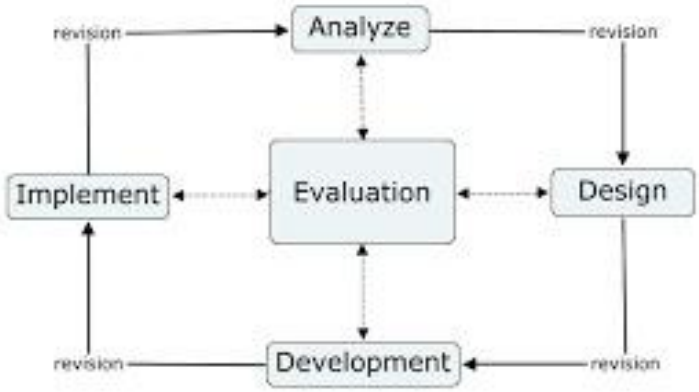
Research Instruments

1. An online lesson for the course Language and Digital Technology for Innovation Development.
2. An evaluation form for the online lesson integrated with AI tools and an active learning model, assessed by experts.
3. An efficiency evaluation form for the online lesson integrated with AI tools and an active learning model, assessed by experts.
4. A lesson plan using the online lesson integrated with AI tools and an active learning approach for the course Language and Digital Technology for Innovation Development.

Instrument Development and Efficiency Evaluation

The online lesson integrated with AI tools and an active learning approach for the course Language and Digital Technology for Innovation Development was developed by the researcher following the ADDIE Model (Indiana State University, 2016; Kemp et al., 1998), which includes the following steps:

Figure 2
Development Process of the Online Lesson Following the ADDIE Model



Analysis

This step includes:

1. **Course Content and Objectives Analysis:**
   The course description and behavioral objectives were analyzed in accordance with the "Digital Era Lifestyle" course under the Bachelor's Degree Curriculum at Naresuan University.
2. **Audience Analysis:**
   The target learners were undergraduate students enrolled in the "Digital Era Lifestyle" course. These students demonstrated foundational computer and network skills at a relatively good level.

3. **Technology Analysis:**
   The researcher selected Adobe Captivate, Canva, and various AI tools to develop the online lesson. These technologies are user-friendly, fast, and innovative. They were applied in the following components:
   1) **Learning Plans, Activity Sheets, and Knowledge Sheets**
   2) **Presentation Media:** Includes texts, images, videos, narration, and animations.
   3) **Interactivity:** The researcher developed interactive quizzes with feedback for learners.
   4) **Course Support:** Social media was utilized for instructional support, enabling learner interaction.
4. **Content Analysis:**
   The scope of content focused on the five ADDIE phases. Behavioral objectives were set, and content validity was reviewed by instructional design experts before lesson development.
5. **Activity and Media Analysis:**
   The researcher applied Active Learning approaches using Generative AI (e.g., ChatGPT, Bard, Copilot) to facilitate information searching, content creation, image generation, and social media interaction (e.g., Facebook for communication and YouTube for on-demand video viewing), aligning with the learning objectives.

Design

1. **Online Lesson Design:**
   The lesson was integrated with AI and Active Learning Model. The instructional sequence was planned using a **flowchart** from beginning to end and detailed through a **storyboard** to guide programming.
2. **Screen Design:**
   Due to screen size limitations, careful design was required to allocate space for content, images, control buttons, and other essential components.

Development

1. **Preparation:**
   Necessary materials such as images, text, and audio were collected or created using software tools and stored for later development.
2. **Lesson Development:**
   The lesson was developed frame by frame using the prepared materials and programming based on the initial flowchart. After completing the online lesson, it was evaluated by experts in terms of media quality, instructional quality, and content.
3. **Documentation:**
   A user manual was prepared, guiding learners on how to use the lesson, including a learning plan.
4. **Suitability Assessment Tool for the Online Lesson:**
   Evaluation forms were developed based on document and research review. The evaluation covered user manuals, learning tools, and AI-integrated components. Expert reviews were used to calculate the Item-Objective Congruence (IOC) index for validation.

Implementation

The fully developed online lesson, integrated with AI and Active Learning strategies, was implemented with the target groups. The lesson's effectiveness was evaluated with students exhibiting similar characteristics to the target group across three stages (Dick et al., 2015).

1. **First Trial:**
   Three non-sample students tested the lesson to identify issues and assess appropriateness. Observations and feedback were used for revision.
2. **Second Trial:**
   The revised lesson was tested with nine students. Effectiveness was measured using the 80/80 standard (E1/E2), where:
   - E1 = effectiveness during the learning process (mid-lesson test)
   - E2 = effectiveness after completing the lesson (post-test)
3. **Third Trial:**
   The final version was implemented with 360 undergraduate students in the "Digital Era Lifestyle" course. Effectiveness (E1/E2) was reassessed to meet the 80/80 criteria.

Evaluation

Learning outcomes were assessed after the students completed the online lesson using AI tools and Active Learning in the course "Language and Digital Technology for Innovation Development." This will be elaborated in Phases 2 and 3.

Data Analysis

Media Quality Evaluation. Likert-scale surveys were employed to assess media quality (Boonchom, 2002). A mean score of 3.50 or higher was established as the criterion for indicating high appropriateness.

Lesson Effectiveness Evaluation (80/80 Criterion). Lesson effectiveness was evaluated using an 80/80 criterion (Promwong, C., 2013), which involved both in-lesson (E1) and post-lesson (E2) assessments.

E1 (Process Effectiveness): This measure was based on in-lesson performance.

E2 (Result Effectiveness): This measure was based on post-lesson assessment.

Phase 2: Learning Outcome Study

This phase investigated students' achievement after using the AI-integrated online lesson in the course "Language and Digital Technology for Innovation Development."

Data Sources

1. **Experts:**
   - **Media and Innovation Experts:** Master's or Doctoral degree in Educational Technology, with ≥ 3 years of teaching experience (or ≥ 5 years with a Master's degree); 3 experts.
   - **Content Experts:** Master's or Doctoral degree in IT, Computer Science, or related fields, or ≥ 5 years university teaching experience; 3 experts.
   - **Instructional Experts:** Master's degree in Curriculum and Instruction or ≥ 5 years of university-level teaching; 3 experts.

2. **Sample Group:**
    - Third-year undergraduate students in the **Educational Technology and Communication** major, enrolled in the 2024 academic year, in the "Language and Digital Technology for Innovation Development" course; students.

Research Instruments

1. **Achievement Test:**
    - **1.1** Analyze course content and create a test aligned with behavioral objectives.
    - **1.2** Analyze Active Learning activities:
        - *Absorb:* Acquire knowledge and ideas
        - *Do:* Experience and explore
        - *Connect:* Integrate knowledge internally and socially
    - **1.3** Create a 4-option multiple-choice test aligned with lesson content and objectives. Experts reviewed the questions for content validity (IOC ≥ 0.5).
    - **1.4** Test items were analyzed for **difficulty (p)** and **discrimination power (r)**:
        - Difficulty: $p = 0.20–0.80$
        - Discrimination: $r \geq 0.20$
          Final test items met these criteria.
    - **1.5** Reliability of the test was calculated using the Kuder-Richardson formula before implementation.
2. **Lesson Plan:**
   Included content summary, objectives, subject matter, Active Learning activities, teaching media, assessments, and evaluations. Content validity was reviewed by three experts using a Likert scale. An IOC score near 1.00 indicated high relevance.

Final Data Analysis

The researcher analyzed the achievement test results by calculating:
- Item difficulty
- Discrimination power
- Reliability of the test

These analyses were conducted using standard computer software.

Research Findings

1. To develop and determine the efficiency of an online lesson integrated with artificial intelligence (AI) tools and the Active Learning Model for the course *Language and Digital Technology for Innovation Development*, the results showed E1/E2 scores of 87.44/86.25. This met the expected standard of not less than 80/80.
2. The comparison of students' academic achievement before and after studying through the developed online lesson integrated with AI and the Active Learning Model for the course *Language and Digital Technology for Innovation Development* is presented below.

Table 1
Academic Achievement Before and After Studying With the Online Lesson Integrated With AI and the Active Learning Model for the Course "Language and Digital Technology for Innovation Development"

Evaluation	N	$\bar{x}$	∑ D	∑ D2	T
Pre-test	120	0.67	995	8447	70.92*
Post-test	120	8.96			

* Statistically significant at the .05 level

According to Table 1, the post-test academic achievement after learning with the online lesson was significantly higher than the pre-test at the .05 level.

3. Students' satisfaction toward learning through the online lesson integrated with AI and the Active Learning Model in the course *Language and Digital Technology for Innovation Development* was at a high level ($\bar{x}$ = 4.02). The satisfaction was divided into components as follows:
    - Learning process based on the online lesson with the Active Learning Model: high satisfaction ($\bar{x}$ = 4.28)
    - Use of media and facilities on the online network: high satisfaction ($\bar{x}$ = 4.25)

Discussion

1. The efficiency of the developed online lesson integrated with AI and the Active Learning Model was found to be 87.44/86.25, exceeding the defined standard of 80/80. This result stemmed from implementing the ADDIE Model (Indiana State University, 2016; Kemp et al, 1998; Wikipedia, 2016) in five phases:
    - **Analysis**: Studied related literature and research, analyzed teaching methods, learners' prior knowledge and skills, lesson content, real classroom settings, supportive digital technologies, teaching media, and active learning strategies.
    - **Design**: Designed lesson content beginning with Program Learning Outcomes (PLOs) and Course Learning Outcomes (CLOs), instructional activities, content scope, behavioral objectives, and lesson flow. A storyboard was created for online lesson screen design, ensuring compatibility with PC, tablet, smartphone, and computer, and internal linking within the lesson.
    - **Development**: Built each screen of the lesson according to the storyboard, including assessment components.
    - **Implementation**: Piloted the lesson with small groups and target learners.
    - **Evaluation**: Evaluated the efficiency and learning outcomes of the online lesson integrated with AI and the Active Learning Model.

This finding aligns with the research of Pechmon and Benjakul (2025), whose active learning techniques enhanced first-year teacher students' understanding of celestial relationships at the Faculty of Education, Rajabhat University Nahhon Si Thammarat, demonstrating the approach's high suitability for instruction (Pechmon & Benjakul, 2025).

2. The comparison of students' academic achievement before and after using the online lesson showed a statistically significant improvement at the .05 level. This improvement is attributed to the integration of AI tools and the Active Learning Model, which promoted deeper learning engagement.

The findings align with previous research. Specifically, Khetbanjong and Mawan (2021) employed AI-based data grouping with Grade 5 students at Samsennok School and found that post-test scores were significantly higher than pre-test scores ($p < .05$). Similarly, Sangwanratanee et al. (2022) reported that Grade 10 students who participated in AI-integrated STAD cooperative learning demonstrated significantly greater academic achievement and more positive attitudes than those in the control group. In the present study, students also reported a high level of satisfaction with the online lesson. The lesson could be accessed from any location with internet connectivity and was compatible with mobile devices, tablets, and smartphones—providing portability and flexibility. Learners were able to study at any time and from any place, connect via cellular or Wi-Fi networks, and communicate through social media platforms, which enhanced interaction between teachers and students. These results are consistent with the study by Panitpichetvong et al. (2024), who explored the use of creative AI in higher education. Their research examined AI integration in teaching, student satisfaction, and the advantages and limitations of AI-assisted learning. Among 20 multimedia and animation students at Bangkok Thonburi University, the findings indicated a high level of satisfaction with AI tools such as Microsoft Bing, Google Bard, and ChatGPT (Panitpichetvong et al., 2024).

Conclusion: Suggestions From the Research

1. The developed online lesson integrated with AI and the Active Learning Model should be adapted for use with learners across various educational levels, institutions, and subjects.
2. Other instructional models should be integrated with online lessons to enhance the effectiveness and learning outcomes further.

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