IICE HAWAII

The 7th IAFOR International Conference on Education – Hawaii

January 06–09, 2022 | Honolulu, Hawaii, USA (and online)

OFFICIAL CONFERENCE PROCEEDINGS

Organised by The International Academic Forum (IAFOR) in association with the University of Hawai'i at Mānoa, USA, the IAFOR Research Centre at Osaka University, Japan, and IAFOR's Global University Partners

ISSN: 2189-1036

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The IAFOR International Conference on Education in Hawaii 2022

Official Conference Proceedings

ISSN: 2189-1036

The International Academic Forum (IAFOR)
Sakae 1-16-26-201
Naka Ward, Nagoya, Aichi
Japan 460-0008
www.iafor.org

Table of Contents

The Educational Values of E-commerce Information Technology for the Law Protection of Citizens

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
In Indonesia, the development of e-commerce is increasing along with the increasing number of internet and social media users. The rapid growth of e-commerce has changed the way consumers make purchases of goods and services. The growth of electronic transactions has a very positive impact on business owners and consumers, because it provides convenience, ease, efficiency and low costs. However, electronic transactions can pose risks and uncertainties that can harm both consumers and entrepreneurs. This article aims to examine the educational values of e-commerce information technology for the protection of citizens. Digital citizenship is closely related in the way in which e-commerce information technology knowledge is mastered and practiced to make significant connections. To see digital education clearly, then clear knowledge about the application of new technologies as part of the government's recommendations for legal protection is needed. This is important because citizens who are educated with knowledge of e-commerce technology will be able to promote ethical values as a democratic society. In this way, the new space will be available not only as a digital reality but also as a full-fledged society needs.

Keywords: Educational Values of E-commerce Information Technology, Ethical Behavior, Legal Protection

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Introduction

The rapid development of technology also has impacted the world economy. One of the impacts is the emergence of the digital economy. The digital economy is a concept regarding the interaction between technological developments that have an impact on macro and micro economics. Along with the development of the business world, e-commerce has become a separate necessity that can increase buying and selling transactions of goods and/or services.

To increase the company's need for e-commerce, business analysis needs to be adapted to big data. The use of big data for e-business is a strong collaborator called "Agility". Big data monitoring has received significant recognition for its ability to transform enterprise methods and its ability to incorporate a wide variety of successful tools and facilities. Leveraging big data technology to its full potential and leveraging it involves intensive tracking and information retrieval.

The continuous development of the internet and information technology has made online shopping a popular mode of purchase. Online shopping is considered convenient and uncomplicated and offers more options than buying in a traditional store. Based on data obtained from iprice.co.id, e-commerce users in Indonesia have reached hundreds of millions. The high public interest is also in line with the high number of consumer complaints that go to the National Consumer Protection Agency (BPKN).

Based on BPKN data, the number of consumer complaints against e-commerce sales during the pandemic ranks first in 2021. One of the causes for this phenomenon is that there are still many e-commerce business owners who are not aware of the obligation to protect consumer rights. This can harm consumers because the position of consumers is far from e-commerce business owners. Although the government has issued Law Number 8 of 1999 concerning Consumer Protection (UUPK) which regulates consumer rights, not all business owners understand it. In addition to consumer rights, UUPK also regulates actions that are prohibited from being carried out by business owners, such as trading in goods and/or services that do not meet the standards required by laws and regulations;

> Entrepreneurs have various prohibitions that need to be considered in trading their goods and or services, but it turns out that many business owners in Indonesia do not pay attention to these regulations and lead to consumer losses. The losses that are often faced by consumers are in the form of discrepancies between the goods received and those ordered, the goods have expired, the goods sold are not in accordance with the standards set by the legislation, and so on. Consumers can also experience fraud because of fictitious sellers so that the transaction is considered never to have occurred even though the consumer has paid a certain amount of money.

Consumers prioritize cost and delivery speed with long-distance distribution of purchased products, so B2C (business to consumer) electronics consumer motivation to prioritize delivery speed is the most important purchasing criteria for consumers, followed by shipping costs and environmental information.

The development of B2C e-commerce can be influenced by the national culture. Economic and other phenomena at the national, government platform or e-business level should take into account the cultural characteristics of the target countries. Then came the dropship phenomenon which is a way of buying and selling in e-commerce where the seller does not have stock of goods and does not make deliveries. The seller does not need to have stock of

goods, because the seller only advertises the goods belonging to the supplier and if a buyer places an order, the seller simply forwards it to the supplier. This dropship phenomenon certainly has its own problems. For example, in terms of liability if the product received by the consumer is not up to standard. In addition to the dropship phenomenon, there are also problems that arise related to fraud experienced by consumers as a result of buying and selling via e-commerce carried out without going through the marketplace. So that there is no third party that monitor the transactions that occur.

In addition to UUPK, regulations regarding e-commerce buying and selling are also regulated in Law Number 11 of 2008 concerning Information and Electronic Transactions jo. Law Number 19 of 2016 concerning Amendments to Law Number 11 of 2008 concerning Information and Electronic Transactions (UU ITE/ITE Law). The ITE Law provides recognition of electronic transactions and documents in relation to the law of engagement and the law of evidence. Then based on Article 3 of the ITE Law, it is said that the use of Information Technology and Electronic Transactions is carried out based on the principles of legal certainty, benefits, prudence, good faith, and freedom to choose technology or technology neutrality.

Although the ITE Law has an important meaning, the existence of the ITE Law is also considered not to be able to solve the existing problems, because the ITE Law is a regulation that only regulates the outer shell so it does not regulate in depth. For example regarding the issue of personal data, several articles in the ITE Law have regulated the protection of personal data used during electronic transactions. However, these provisions are still general in nature and in the implementation require more technical provisions. Therefore, the provisions regarding the protection of personal data contained in the ITE Law still require further regulations that are more detailed in nature.

Furthermore, regarding the technicalities of complaints that are not clear, the ITE Law has mentioned prohibited actions such as misuse of personal data, fraud, and so on. However, in reality, these problems cannot be solved using the ITE Law alone. Then until now the aggrieved party is still experiencing difficulties in terms of the complaint mechanism. Apart from consumers, business owners may also experience losses caused by consumers. For example: if the consumer has bad intentions by ordering a number of goods and or services but the consumer does not pay a certain amount of money.

Various problems that arise along with the increase in e-commerce require legal protection for the risks that may occur in practice. In fact, even though government regulations and the ITE Law have been updated, various forms of violations still continue to occur, especially cases of fraud, tax compliance, and the threat of cybercrime.

Based on the problems above, it is necessary to educate consumers and business owners in Indonesia, especially in terms of buying and selling via e-commerce. So in this article, we will discuss the problem What is the educational values of e-commerce information technology for the law protection of citizens ?

Literature review

The definition of E-commerce is a trading system via the web online using communication networks and computers to carry out business processes. Electronic commerce is a business that takes place in an electronic network such as the internet. In the global pandemic,

companies must strategically build e-commerce and corporate platforms along with offline methods for supply as consumers turn online to avoid infectious diseases and increasingly engage in sustainable consumption behavior, thereby providing a new perspective on the important role of PEEP (Perceived Effectiveness of commerce Platform) and economic benefits and set an additional point to further explore the sustainable consumption behavior of customers in borderline conditions of pandemic fear.

Consumer protection by the United Nations in the Guidelines for Consumer Protection, for the benefit of consumers (legitimate needs): 1) Protection of consumers from hazards to their health and safety; 2) Promotion and protection from consumers socioeconomic interests; 3) Availability of adequate information for consumers to give them the ability to make the right choices according to their personal wishes and needs; 4) Consumer education; 5) Availability of effective compensation efforts; 6) Freedom to form consumer organizations or other relevant organizations and provide opportunities for these organizations to voice their opinions in the decision-making process concerning their interests. Consumer rights are universally recognized and must be protected and respected, namely i) security and safety rights; ii) the right to information; iii) the right to vote; iv) the right to be heard; and v) the right to the environment. Free trade is a universal marketing discipline. Marketing concepts from a global marketing perspective have changed from time to time with stages 1). focus on better products based on internal standards and values; 2) marketing focus is shifted from products to customers by updating the marketing mix (product, price, promotion and place); and 3). a new concept of marketing into a strategic concept. In a global market, citizen consumer protection is important because citizen consumers have universal and specific rights. In the world of education, technological developments is done by using multiple applications of e-commerce information technology.

According to Assael (1997), consumer learning is a change in behavior that occurs as a result of past experiences. Consumers get various experiences in purchasing products and what product brands they like. Consumers will adapt their behavior based on their past experiences. Some basic elements in learning include motivation and reinforcement. In motivation, it can be split into directed learning and incidental learning. Directed learning occurs when learning is the main target during information processing whereas incidental learning occurs when learning is not the target of processing. In reinforcement, consumers can get a positive or negative response. A positive response can increase the probability of repurchasing while a negative response can reduce the existing positive response. Learning theories include: Classical conditioning, Instrumental conditioning, Cognitive learning as a psychological response and Passive learning

The development of a Category Theory model that concentrates on understanding the emotional intelligence of managers and leaders and maps it towards the emotional intelligence of customers so that gaps and expectations can be narrowed using emotional intelligence. Management of high emotional intelligence can successfully increase client enthusiasm and reduce consumer dissatisfaction in the financial sector. Emotional intelligence is one of the main strategies that must be followed in any e-commerce to increase business growth.

Educational innovations in learning methods include formulations on organizing teaching materials, delivery strategies, and managing activities by taking into account goals, obstacles and individual characteristics in order to obtain effective results, efficient results and create learning attractiveness. Appropriateness in carrying out educational innovations is very likely

to create many conducive and fun learning conditions so that learning activities (instructional activities) can take place effectively and efficiently in facilitating the achievement of a component that will determine the creation of conditions during the learning process. Learning using information technology has been embedded in the era of globalization and the cultivation of educational values needs to be further developed by 1) working while learning; 2) cultivate personality into a dynamic, confident, courageous, responsible and independent personality; 3) learning in every available opportunity; 4) good deeds are always applied. Values that are starting to disappear in the era of globalization include cultural values, formal juridical value and religious value. The cultivation of these values needs to be strengthened to elevate the dignity of the nation. Culture and national beliefs are interrelated but not all effects between the dimensions of culture and trust are mediated through the disposition to believe, but people's culture can also directly influence the context-specific perception of online store beliefs.

Social media, with its ability to safeguard individual privacy and freedom, has been able to override the impact of some traditional cultural dimensions on consumers' online purchasing decisions and overall s-commerce activity. Consumers with a high collectivism orientation tend to rely heavily on in-group information sources for their decisions regarding s-commerce adoption.

Some things that must be prepared to overcome the existing challenges include a) Preparation of a more innovative learning system for individuals who are more competitive and skilled in the aspects of data literacy, technological literacy and human literacy. b) Reconstruction of educational institutional policies that are adaptive and responsive to the era of globalization in developing the required transdisciplinary sciences and study programs. c) Preparation of responsive, adaptive and reliable human resources. d) Rejuvenation of infrastructure and development of education, research and innovation infrastructure also needs to be carried out to support the quality of education, research and innovation. The ability to use information technology is one solution to prepare a competent millennial generation.

Approach Method

The approach method used is the normative juridical method or doctrinal legal research, where legal research is related to problems in e-commerce in Indonesia. This study uses secondary data obtained from primary and secondary legal materials. Sources of business law include the principle of contractual agreements from involved parties where each party must comply with the agreed rules and the principle of contractual freedom where business owner can make and determine the contents of the agreement they previously agreed. In general, sources of business law based on Indonesian legislation include: Trade Law (Trade Code); Regulation Legislation outside the Criminal Code, Civil Code and Trade Code; Civil Law (Civil Code) and Public Law (Criminal Economy/Civil Code). Meanwhile, the implementation of e-commerce activities in order to provide legal certainty and legal protection for stakeholders refers to Law no. 11 of 2008 concerning Information and Electronics (UU ITE), the e-commerce Road Map (Electronic-Based National Trading System Roadmap) of 2017-2019 and Presidential Decree Number 74 of 2017. The development of information and communication technology has caused e-learning to become wider with learning whose implementation is supported by technology services such as video-audio, smartphones, computers and the internet, by combining technological tools in the learning process.

Discussion

In general, e-commerce can refer to all forms of trade transactions using electronic media connected to the internet Through e-commerce, sellers do not need to meet with buyers to make trade transactions. Until 2017 - 2020, hundreds of millions of Indonesians have become e-commerce users with the following details: 96,532,300 Shopee users, 84,997,100 Tokopedia users, 31,409,200 Bukalapak users, 22,674,000 Lazada users, 18,695,000 Blibli users, 4,785. 000 JD ID users, and the rest are other e-commerce users such as Zalora, Sociolla, etc. Then according to Wearesocial and Hootsuite data, around 90% of internet users in Indonesia have shopped online. Based on this data, it can be seen that the community has a very high interest in digital economic activities. Apart from e-commerce, buying and selling online can also be done directly between sellers and buyers without going through the marketplace.

In the process of buying and selling transactions by e-commerce, there are often defaults by the parties. From the buyer's side, they usually default in the form of late payments, not making payments, making payments but not in accordance with what was agreed. Meanwhile, from the seller's side, they usually default in the form of sending goods that are not in accordance with what has been agreed, delays in delivery of goods, etc. Seeing so many violations committed by the parties, the parties need to understand rights, obligations, legal protection and e-commerce education.

Knowledge of user risk perception as a personality trait, as well as techniques that enable prediction of customer needs and preferences. Human factors play an important role in social and economic processes, the topic of personality can be applied in various fields of contemporary world science. Certain e-Shop functionality is preferred by certain user groups. The Machine Learning approach treats data as the unknown, and it is primarily focused on prediction rather than inference and aims to predict unobserved outcomes or future behavior. Thus, knowing consumer risk perceptions and applying Machine Learning methods to predict user preferences makes it possible to optimize certain features in e-Commerce. Emotionally stable people tend to behave confidently and calmly, and use a rational approach to problem solving. They also prefer to have different shipping options and more secure payment methods. Perceived risk is positively related to consumers' preference to track their order status and view on-time delivery prices. It is also very important for online customers to view detailed product photos to reduce the possibility of disappointment.

The educational values of e-commerce information technology for consumer protection aims to increase consumer awareness, ability and independence to protect themselves; elevating the dignity of consumers by preventing them from the negative access of the use of goods and/or services; increasing the empowerment of consumers in choosing, determining, and demanding their rights as consumers; create a consumer protection system that contains elements of legal certainty and information disclosure as well as access to information; raise awareness of business owners regarding the importance of consumer protection so as to grow an honest and responsible attitude in doing business; and improve the quality of goods and/or services that ensure the continuity of the business of producing goods and/or services, health, comfort, security, and safety of consumers. The introduction of information technology that is not only in regional centers but also in remote areas will lead to a significant increase in the volume of e-commerce. This will lead to significant changes in other areas such as in the banking sector.

Protection before the transactions is carried out through the making of laws and regulations such as UUPK in the hope that there will be restrictions governing the transaction process. Meanwhile, protection after the transaction can be carried out through the District Court or through the Consumer Dispute Settlement Agency. In the event that a business owner is in default, based on Article 19 paragraph (1) of the UUPK, business owners are responsible for providing compensation for damage, pollution, and/or consumer losses due to consuming goods and/or services produced or traded. Then the compensation can be in the form of a refund or replacement of goods and/or services with a similar or equivalent value, or health care and/or the provision of compensation in accordance with the provisions of the applicable laws and regulations.

Consumer privacy is a public policy issue that has received substantial attention. Consumer privacy protection is the integration of business standards, ethics and public policies to reduce the inevitable erosion of privacy. The crime of fraud is regulated in Article 378 of the Criminal Code. However, the element of fraud in Article 378 of the Criminal Code is still in the form of conventional fraud, namely fraud that generally occurs and is used in all things that exist in the real world. The use of Article 378 of the Criminal Code is not appropriate if it is used to ensnare criminal acts of online fraud, due to limitations regarding the types of evidence based on the Criminal Procedure Code. In addition to the Criminal Code, the crime of fraud is regulated in the ITE Law.

Based on Article 28 paragraph (1) of the ITE Law, it is stated that anyone who intentionally and without rights spreads false and misleading news that results in consumer losses in electronic transactions is threatened with a maximum imprisonment of 6 (six) years and/or a maximum fine of Rp. 1 billion rupiah. Although the ITE Law does not specifically state the existence of a criminal act of fraud, but implicitly there are elements that are almost the same as the criminal act of fraud which is generally regulated in Article 378 of the Criminal Code. In other words, an act can be criminalized if it fulfills the elements of a criminal act that can become the standard or basis for it to be said that an act is a criminal act. It can be said that the ITE Law is still not perfect or still unclear to be used as a basis of reference for acts of fraud, this is because the act of fraud itself has various forms.

Based on the problems above, clearer regulations are needed in order to protect consumers from fraud. As stated by Mochtar Kusumaatmadja, the purpose of law is ultimately directed at providing protection to human interests. Therefore, legal protection for the community must be realized in the form of legal certainty. So that the government should form laws and regulations that can protect citizens, especially people who use electronic transactions from fraud, so that legal certainty can be realized. Learning the business of buying and selling via e-commerce requires education with the internet so that fraud does not occur and prevention and legal protection can be carried out against crimes both individuals and corporations. The Industrial Revolution 4.0 has changed life leading to globalization which has increased productivity and efficiency in the modern world which is characterized by Cyber Physical Systems, Internet of Things and Networks.

The rapid development of digital technology also has a negative impact, namely the increase in digital crimes such as cyber crime and corporate crime. The rapid progress in the economic field has led to many crimes being committed by white collar crimes or professionals. Cyber Physical Systems and the Internet of Things can be used for learning facilities via zoom and YouTube about buying and selling using the internet, such as when buying and selling occurs, when default happened, fraud and how to provide legal protection for consumers and

business owners, as well as how to get damages, compensation or replacement and when it expires.

Based on the current condition of consumers, it appears that the position of consumers is still very weak compared to the position of producers because the position of consumers is always on the side of the disadvantaged, it is necessary to empower consumers. Consumer empowerment can be carried out through adequate consumer protection laws and become relevant in consumer transactions which are divided into 3 stages, namely pre-purchase, during purchase and after purchase. Consumers empowerment must be work on in order to have a balance with the position of producers who have been far superior. Consumers actually have the potential to have a balanced position with producers due to the dependence of producers' business progress on consumers and consumers can even outperform producers if consumers unite.

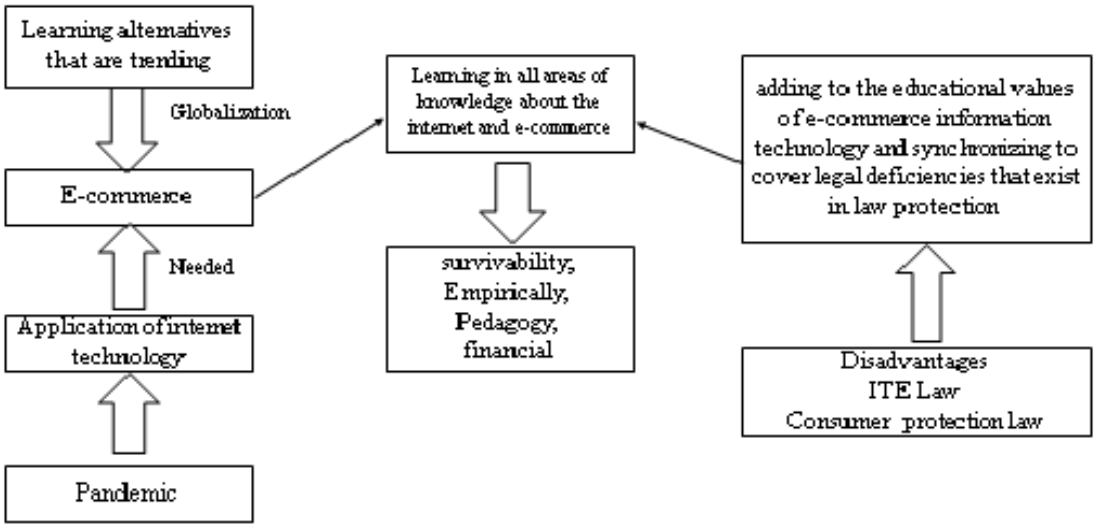

Figure 1: The Educational Value of e-Commerce Information Technology
Source: Researcher analysis (2022)

The pandemic that has hit the world has made changes in life that will change human habits, which they must learn in all fields of knowledge about the internet and e-commerce, about the ability to survive, empirically, pedagogically, financially. This learning is important to know about the internet because the internet can prevent crime even though it can also be used to commit crimes so that learning in the world of e-commerce business can increase one's knowledge not only to commit crimes but also to prevent crime. Learning is changing rapidly, resulting in a shift for learning agents to master and apply e-commerce information technology. Shifts in the learning process from the classroom to anytime and anywhere, from paper to online and physical facilities to network facilities.

The development of e-commerce information technology makes the notion of e-learning broader, namely learning whose implementation is supported by technological services such as video-audio, smartphones, computers and the internet. Learning agents use multiple applications, combining technological tools in the learning process. Weaknesses in the ITE Law and the Consumer Protection Law must add to the educational values of e-commerce information technology and synchronize them to cover legal deficiencies that exist in legal protection.

Conclusion

E-commerce buying and selling is increasingly common causing a need in skills using the internet which change conventional buying and selling directly. Fraud of buying and selling in e-commerce is increasingly common, so learning to buy and sell is also performed online, namely with zoom or youtube. Conventional offenses regulated in the Criminal Code cannot be used to follow e-commerce fraud, so there is a need for a breakthrough in e-commerce as well as for learning legal protection against e-commerce fraud. The educational values of e-commerce information technology use multiple technology applications which are continuous education based on the learning process, namely Learning to know, Learning to do, Learning to be and Learning to live together.

The educational values of e-commerce information technology for consumer protection aim to increase consumer awareness, ability and independence to protect themselves; elevating the dignity of consumers by preventing them from the negative access of the use of goods and/or services; increasing the empowerment of consumers in choosing, determining, and demanding their rights as consumers; create a consumer protection system that contains elements of legal certainty and information disclosure as well as access to information; raise awareness of business owners regarding the importance of consumer protection so as to grow an honest and responsible attitude in doing business; and improve the quality of goods and/or services that ensure the continuity of the business of producing goods and/or services, health, comfort, and security of the consumers.

Consumers need to act intelligently by being careful before buying the goods and/or services needed, buying as needed during purchase, and after purchasing by keeping proof of payment and a warranty card. In addition to having rights, consumers are also obliged to follow the instructions for using information, have good intentions, not to violate the rights of business owners. The government should form laws and regulations that can protect citizens, especially people who use electronic transactions, from fraud so that legal certainty can be realized. The results of this study find the educational values of e-commerce information technology for financial learning based on the ability to understand existing regulations and are globally connected for the sake of sustainable system changes for the legal protection of citizens.

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Commercial Code

Code of Civil law

Criminal Code

Law number 8 of 1999 concerning Consumer Protection

Law number 11 of 2008 concerning Information and Electronic Transactions

Law number 19 of 2016 concerning Amendments to Law Number 11 of 2008 concerning Information and Electronic Transactions

Intellectual Property Legal Protection Against the Resilience of Start-Ups in Overcoming the COVID-19 Pandemic in the Millennial Generation

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Abstract
This study aims to raise the community's economic resilience, especially start-up companies, in overcoming the turmoil of the COVID-19 pandemic in the millennial generation through intellectual property protection. During the COVID-19 pandemic, various large companies and small and medium businesses experienced a decline in the business sector. As one of the actors in start-up companies, the millennial generation has also experienced a fall, which requires strengthening its resilience. The problem in this study is how the model of intellectual property legal protection against the resilience of start-ups in overcoming the turmoil of the COVID-19 pandemic. What are the obstacles in applying the intellectual property legal protection model to the resilience of start-up companies? The research method used in this research is normative juridical. Research locations in start-up companies in Indonesia, including the old city of Semarang, are cultural heritages as open spaces, providing business opportunities between local and modern businesses. This research was analyzed qualitatively. This research is expected to benefit the growth of the city's competitive ability. The results show that intellectual property protection is still low in start-up companies in the millennial generation due to other factors besides product quality. Product quality improvement can be made through the protection of intellectual works

Keywords: Legal Protection, Intellectual Property, Start-Up Resilience, COVID-19 Pandemic, Millennial Generation

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Introduction

Intellectual Property Protection becomes very urgent when productivity results decrease due to business competition in certain areas whose products are homogeneous. The Intellectual Property Rights System is proposed to justify economic development, increase innovation, and improve people's welfare.[1] Intellectual property is a right that arises or is born because of human intellectual ability through power, creativity, taste, and intention. Intellectual property is an intangible asset that is a source of productive profit for a company.

Intellectual Property from an economic perspective is considered capable of contributing to the economic growth of a nation. Stuart E.Eizenstat [2] confirms that the protection of innovation is critical for the future growth of developed and developing countries. The future of a nation can no longer only be piled on the natural wealth it has. Natural wealth owned by a government, its role, and contribution are fading along with the depletion of the availability of natural wealth itself, especially in the type of natural wealth that is not renewable.

During the COVID-19 pandemic, every business activity faces significant economic growth challenges, including start-up companies. On the one hand, this situation benefits new companies or start-ups that can act quickly and flexibly in the face of a pandemic with their innovations. Still, on the other hand, it has also experienced a decline due to the lack of awareness of start-up businesses to register their intellectual property for the products they produce. Data shows the number of micros, small, and medium enterprises (MSMEs) in Semarang City is around 16,327 business actors, and only 500 to 700 business actors have Intellectual Property Rights. Business actors who already have IPRs come from 10 business sub-sectors, including culinary, batik, and handicrafts.[3]

The old city of Semarang is located in Indonesia, known as the city of Dutch colonial heritage, which is currently a mainstay tourist destination in Semarang City, providing space and a place for business actors to market their products. Business actors who enter the category of start-up companies or start-ups are still developing to continue finding markets and developing their products. Start-ups are technology-based service and product companies. The data shows very few start-up companies in the old city registered and have intellectual property certificates compared to the number of business actors in the old city. For the business world, especially start-ups, it is essential to get the legality of the establishment of a start-up company, as well as to get intellectual property protection. This is intended to protect the innovations of the products produced. Therefore, an Intellectual Property Protection Model is needed for the Resilience of Start-ups in Overcoming the COVID-19 Pandemic in the Millennial Generation.

[1] Utomo, Tomi Suryo. 2010. *Hak Kekayaan Intelektual (HKI) di Era Global Sebuah Kajian Kontemporer,* Yogyakarta: Graha Ilmu. 1st ed. P.19

[2] Eizenstat, Stuart E. 2011. US Deputy Secretary of the Treasury, *Perlindungan Hak Milik Intelektual dan Negara Ekonomi yang baru tumbuh,* Article, in Budi Santoso, *Pergeseran Pandangan Terhadap Hak Cipta Studi pergeseran pandangan tentang Hak Cipta di Amerika Serikat dan di Indonesia,* The Inaugural Speech was delivered at the Acceptance Ceremony for Professorship in Law at the Faculty of Law, Diponegoro University, 22nd March 2011, P.24

[3] Rizqi, Alif Nazzala. 2019. https://semarang.bisnis.com/read/20190725/536/1128925/baru-700-pelaku-usaha-di-semarang-miliki-hak-kekayaan-intelektual. Accessed on 30th December 2021

Research Method

The research method used in this research is normative juridical with a statutory and conceptual approach. Research locations in Indonesia include the old city of Semarang as a city of cultural heritage. The old city of Semarang as an open space provides local and modern business opportunities. Data sources are obtained through secondary data supported by primary and secondary legal materials, which are then analyzed qualitatively.

Discussion

Start-up Concept

Start-up is a process of starting a new business (pilot) developed to operate in technology. These products are made in the form of applications in digital format and run through websites online. Many aspects surround the establishment of a Start-up company, such as how the contract is made, how the intellectual property rights are protected, what the form of business is, how it is funded, and so on. There are several types of Start-ups: game creator start-ups; start-up trade (e-commerce); start-ups in the field of informatics (Gojek, Traveloka, Bukalapak); start-up of educational applications (Ruang Guru) and start-up of telemedicine applications/start-up of Health applications.

The development of start-ups in Indonesia is currently growing very rapidly. Indonesia is fertile ground for the development of start-ups. It is proven that Indonesia occupies the fifth position in the world of start-up businesses, namely 2,913 start-ups in 2019, after the US, India, UK, and Canada.[4] Start-ups have now become engines of economic growth for the country. This start-up has been able to open thousands of job opportunities and help reduce unemployment in Indonesia. In 2020, during the COVID-19 pandemic, Indonesia has 11 unicorns, including Tokopedia, Traveloka, Bukalapak, and OVO. In addition, there is one decacorn, namely Gojek. Unicorn is a term for start-ups with a valuation above US$1 billion or IDR 14 trillion. In comparison, a decacorn is a term for start-ups with a valuation above US$10 billion or IDR 140 trillion. CB Insights data titled The Complete List of Unicorn Companies shows that Nusantara recorded four new unicorns this year, namely J&T Express, OnlinePajak, Ajaib, and Xendit.[5]

The high development of start-ups in Indonesia, on the one hand, is very encouraging for the potential of the millennial generation to take advantage of start-up business opportunities in the era of the COVID-19 pandemic. Still, on the other hand, many have failed. One of the causes of its failure is the lack of knowledge of start-up business actors on the legal aspects of establishing a start-up and the low number of intellectual property registrations.

[4] https://kominfo.go.id/content/detail/23975/di-wef-2020-menkominfo-pamerkan-pesatnya-perkembangan-start-up-indonesia/0/sorotan_media. Accessed on 28th December 2021

[5] Setyowati, Desi. 2021 https://katadata.co.id/desysetyowati/digital/61c416a490fcd/hampir-200-startup-ri-raih-investasi-total-rp58-6-t-goto-paling-besar#:~:text=Startup-,Hampir%20200%20Startup%20RI%20Raih%20Investasi%20Total%20Rp58%2C6%20T,Tokopedia%20mendapatkan%20investasi%20paling%20besar. Accessed on December 30th 2021

Legal Aspects of Start-ups

Every economic activity carried out by a business actor has legal consequences. A business actor in running a start-up is based on legal provisions because the law is made to fulfill the principles of justice, benefit, and certainty. As stated by Gustav Racbruch with his theory of the purpose of law made to satisfy the values of justice, expediency, and legal certainty. In carrying out the three legal objectives, the principle of priority must be used.

Likewise, start-up companies to be established must meet these values, one of which is the value of legal certainty that the establishment of start-ups must be legal. The legality of establishing start-ups in Indonesia is based on Law Number 19 of 2016 concerning Electronic Information and Transactions, Law Number 7 of 2014 concerning Trade, and Presidential Regulation Number 74 of 2017 concerning the Roadmap for the National Electronic-Based Trading System.

The legal provisions governing Start-ups are still regulated in the old rules, namely Law Number 11 of 2008, in Article 9: the existence of e-commerce consumer protection which explains that start-up business actors who offer products through electronic systems must provide complete and accurate information concerning the terms of the contract, the manufacturer, and the product provided. Meanwhile, in the new provisions, Article 26 paragraph (1) of Law Number 19 of 2016 concerning Information Technology, any information through electronic media concerning a person's data must be carried out with the person's consent. Article 1 number (2) of the new ITE Law also states that a start-up is an electronic transaction, a legal action carried out using a computer, computer network, and/or electronic media.

In addition, in establishing a Start-Up, there are several licensing documents that a start-up business actor must own. These documents include the Trading Business Permit (SIUP) as contained in the Minister of Trade Regulation Number 7 of 2017 concerning the Third Amendment to the Minister of Trade Regulation Number 36 of 2007 concerning the Issuance of SIUP. The SIUP will remain valid as long as the Start-up company carries out business activities. To obtain a SIUP document to ensure that the commercialized goods have obtained an operational permit from the relevant institution or not, if the commercialized goods do not have a SIUP permit, they will be subject to criminal sanctions.

Intellectual Property Legal Protection Model against the Resilience of Start-ups in Overcoming the COVID-19 Pandemic in the Millennial Generation

Business actors who want their start-ups to grow must be registered to get intellectual property legal protection. Intellectual property law in the institutional context, two multilateral institutions respect intellectual property issues, namely WIPO (World Intellectual Property Organization) and TRIPS (Trade-Related Intellectual Property Rights). TRIPS essence contains four regulatory groups. First, linking IPR with the concept of international trade. Second, member countries must comply with the Paris Convention and the Berne Convention. Third, establish their own rules or regulations. Fourth, it is a provision on matters that generally include law enforcement efforts contained in the legislation of member countries.[6] The Paris Convention aims to achieve unification in the field of trademark legislation with the hope that there will be a single type of trademark or trademark law that

[6] Purba, Achmad Zen Umar. 2005. *Hak Kekayaan Intelektual Pasca Trip's.* 1st Ed, Bandung: Alumni. P. 22

can regulate trademark matters uniformly throughout the world. Revisions to the Paris Convention were carried out, among others, at The Hague in 1925, London in 1934, Lisbon in 1958 and Stockholm in 1967.[7]

Indonesia, as part of the international community, became a member of the two organizations by ratifying the Paris Convention for the Protection of Industrial Property and Convention Establishing the World Intellectual Property Organization and approving the results of the Uruguay Round decision with Law No. 7 of 1994 on WTO (World Trade Organization) Ratification. Indonesia is committed to complying with the various consequences that arise as a member of the two institutions by taking essential steps, including aligning the set of laws and regulations in intellectual property rights (IPR). In 1997, the Government of Indonesia revised several IPR laws and regulations, particularly in trademarks, namely Law Number 19 of 1992 concerning Marks, replaced by Law Number 15 of 2001 concerning Marks. Then was born the latest Trademark Law No. 20 of 2016 concerning Trademarks and Geographical Indications.

Law is not a static institution, according to Satjipto Rahardjo, [8] but is experiencing development. Law and society have a reciprocal relationship. Likewise, intellectual property protection shows its correlation with Satjipto Rahardjo's view on its role and function in achieving prosperity and international trade. Intellectual property legal protection is needed because the intellectual property has a high economic value and provides benefits as an intangible asset to increase the resilience of start-ups in overcoming the COVID-19 pandemic in the millennial generation.

There was a decline in start-ups during the COVID-19 pandemic. According to start-up ranking records, the number of start-ups in Indonesia will reach 2,219 companies in 2021. The majority of start-ups are domiciled on the island of Java, especially Jabodetabek (Jakarta, Bogor, Tangerang, and Bekasi). The number of start-up business actors in Semarang is around 16,327. Only 500 to 700 business actors have intellectual property rights. This proves that the awareness of start-up business actors is still low to register their intellectual property in the form of brands, patents, or trade secrets for their products. To increase awareness of Start-up business actors, efforts to maintain resilience by registering an intellectual property for their products. Therefore, a model of intellectual property legal protection is needed for start-up resilience for the millennial generation during the covid 19 pandemic. Legal culture is more likely to immediately improve behavior or awareness of the law to register the intellectual property for legal protection.

Intellectual property in the national legal system includes copyright as regulated in Law Number 28 of 2014; patent rights are regulated in Law Number 13 of 2016; trademark rights and geographical indications are regulated in Law Number 20 of 2016; Trade Secrets are regulated in Law Number 30 of 2000; industrial design as regulated in Law Number 31 of 2000; integrated circuit layout design is regulated in Law Number 32 of 2000. It will be detrimental to anticipate the risk of their products being taken or imitated by other parties, and start-up business actors register their trademarks. With trademark registration, it will provide legal protection and add value to its business during the development of information technology.

[7] Gautama, Sudargo. 1993. *Hukum Merek Indonesia,* Bandung: Citra Aditya Bakti. P.157-158.
[8] Rahardjo, Satjipto. 1991. *Ilmu Hukum.* Bandung: Alumni. P.213

In addition to brand rights, it is also vital for start-up business actors to understand copyright. In copyright, there are computer programs closely related to start-ups. Copyright automatically gets legal protection to get its exclusive rights that arise after being expressed in a tangible form, including computer programs contained in start-ups. A computer program is a set of instructions described in the form of language, code, schematics, or any form intended to make the computer work to perform certain functions. However, computer programs are excluded in Law Number 28 of 2014 concerning Copyright, protected in Law Number 13 of 2016 concerning Patents. Examples of software (computer programs) excluded from copyright are created only to protect technical problems. For example, the Gojek, Grab application (software) can be installed on almost all consumer gadgets.[9]

The intellectual property protection model built is based on the awareness of Start-up business actors to understand the importance of intellectual property registration, especially trademarks as well as patents for Start-up businesses. In this case, there is assistance from related parties, the local government, to provide consultation and register intellectual property. The chart below shows a model of intellectual property legal protection for start-ups to realize Start-up resilience during the COVID-19 pandemic:

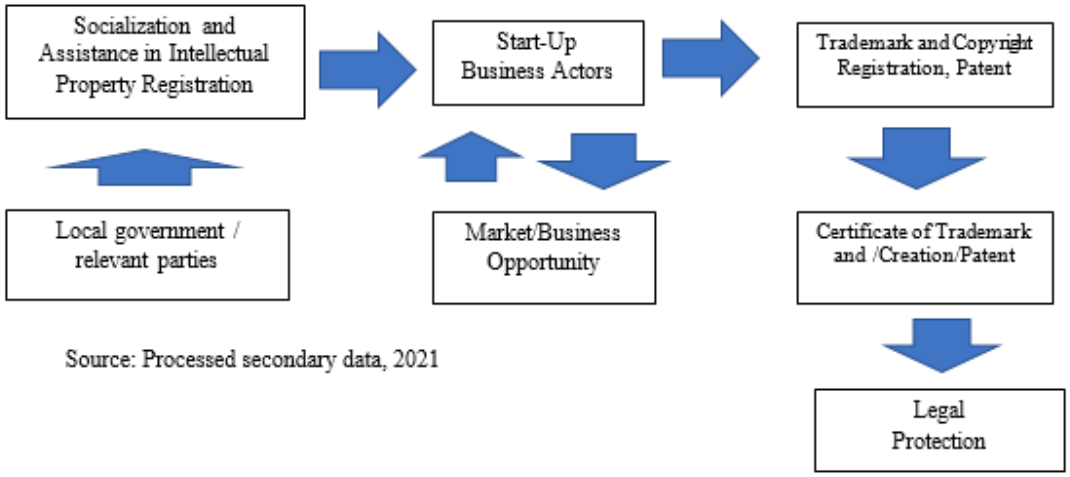

Figure 1. A model of intellectual property legal protection for start-ups
Source: Processed secondary data, 2021

As mentioned above, the intellectual property protection model chart shows that Start-up business actors need a helping hand from the local government/related parties to maintain a Start-up business during the COVID-19 pandemic. The Indonesian ICT/Digital Creative Industry Society (MIKTI) recently designed a program called Start-up Merdeka, intended to help students as a generation of millennial who want to create start-ups. This program has been running for one semester, called MIKTI, in line with the Independent Learning Campus (MBKM) policy launched by the Ministry of Education, Culture, Research, and Technology. A total of 130 students from 28 universities took part in the first batch of independent study programs certified by Start-up Merdeka. Students have business ideas brought into programs designed to guide students to form a mindset and prepare knowledge and skills as start-up founders.[10]

[9] Rizki, Mochamad J. 2020. https://www.hukumonline.com/berita/baca/lt5fbe07a824547/wajib-tahu-ini-pentingnya-pendaftaran-merek-bagi-ukm-dan-startup/. Accessed on 25th November 2021
[10] Jati, Anggoro Suryo. 2021. https://inet.detik.com/business/d-5868859/startup-merdeka-program-belajar-startup-untuk-mahasiswa. Accessed on 29th November 2021

Seeing Indonesia's continuous effort in preparing the millennial generation, it is hoped that the Indonesian millennial generation can make start-ups into unicorns in the future. As already owned by Indonesian start-ups that have entered unicorns such as: Gojek, Bukalapak, Ovo, OnlinePajak, J&T, Xendit, Ajaib, and Kopi Kenangan. Kopi Kenangan gets the first phase of funding worth IDR 1.3 trillion, so Indonesia already has 9 Unicorns in the country.[11]

Obstacles in Implementing the Intellectual Property Protection Model for Start-ups for the Millennial Generation

Start-up business in the COVID-19 pandemic has become an option among millennial. However, building an intellectual property protection model for a start-up business is not easy for the millennial generation. Start-ups require expert talent in running a start-up business by utilizing information technology. Still, in practice, start-up businesses encounter obstacles in applying the intellectual property legal protection model, including low awareness of intellectual property understanding, causing low intellectual property registration. In the end, legal protection for start-up business people has not been maximized.

Ministry of Research and Technology / BRIN Jumain Appe explained several obstacles that prospective start-up business actors in Indonesia often experience.[12] In general, these obstacles are government policies/regulations related to distribution permits or certification to set up a business that requires a long and expensive process, so start-up businesses fail. Meanwhile, other obstacles are external and internal factors. External factors are business competition factors, while internal factors do not have a clear goal and vision; not yet professional in designing the products contained on the website or brochures; lack of focus on start-up performance; governance/ management/ finance; build start-ups but are not wanted by today's society; and accept employees who do not have the skills, nor have they found market products.[13]

Conclusion

Start-ups are an arena for the millennial generation to cultivate their creativity to be honed and nurtured with their team to create start-up resilience through intellectual property protection. Start-ups inspire the millennial generation to channel their talents through information technology. During the pandemic, the start-up business experienced a decline and the lack of awareness of start-up business players to maintain the start-up business to register intellectual property. By registering intellectual property, the start-up business gets intellectual property protection.

The wealth protection model starts from the existence of a legal culture which is the attitude and behavior of a start-up business in developing its business. With assistance and socialization, people will be aware of the importance of intellectual property registration to get legal protection.

[11] Haryanto, Agus Tri. 2021. https://inet.detik.com/business/d-5873595/ada-anggota-baru-ini-daftar-startup-unicorn-indonesia-di-akhir-2021. Accessed on 29th December 2021

[12] Prayoga, Fadel. 2020. https://economy.okezone.com/read/2020/08/27/455/2268424/deretan-masalah-yang-dihadapi-bisnis-start-up. Accessed on 28th November 2021

[13] Startup Studio Indonesia. 2021. https://startupstudio.id/tantangan-perkembangan-startup-di-indonesia/. Accessed on 28th November 2021

The obstacles faced in implementing the intellectual property protection model for the millennial generation, namely the lack of awareness of intellectual property understanding, cause the low intellectual property registration.

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Utomo, T. S. (2010). *Hak Kekayaan Intelektual (HKI) di Era Global Sebuah Kajian Kontemporer* (1st ed.). Graha Ilmu.

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Legal Protection of the Millennial Generation Against the Issue of Junk Food During the COVID-19 Pandemic

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The millennial generation, as the nation's next-generation, needs safe food consumption and does not endanger their health and soul, even though in reality, the level of awareness of the younger generation to consume safe, quality, and nutritious food are still lacking because they prefer fast food because it is practical and tastes good regardless of the dangers that threaten fast food, namely in addition to being addictive, consuming too much fast food can cause complications, such as obesity or chronic diseases that can affect activities. This study aims to discuss legal protection for the millennial generation against the rise of fast food during the COVID-19 pandemic, which impacts the resilience of the nation's next generation. The research method uses a normative juridical method that uses secondary data as the primary data supported by empirical data, namely millennial consumers, and will be analyzed qualitatively. The study results showed that legal protection for the millennial generation already exists but is not optimal because the legal awareness of the millennial generation to the importance of consuming healthy and safe food is low, and there is no government alignment with healthy food management. Therefore, healthy food education is needed through social media, a millennial trend.

Keywords: Legal Protection, Millennial Generation, Junk Food, COVID-19 Pandemic

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Introduction

The emergence of the coronavirus pandemic in Indonesia at the beginning of 2019 or which was given a scientific name as COVID-19, has impacted humans' health problems. The COVID-19 pandemic has effects ranging from mild flu to severe ones equivalent to or even more severe than MERS-CoV and SARS-CoV (Kirigia et al., 2020), limiting people's daily activities.

Because the transmission of the pandemic was very fast, the Indonesian government then made policy rules for restrictions on traveling to and from countries included in the red zone of transmission during the COVID-19 pandemic. The purpose of these restrictions is to break the chain of transmission of COVID-19. This step follows several countries' policies (Dito Arditia, 2020). The policy rules for Large-Scale Social Restrictions (PSBB) to the Implementation of Restrictions on Community Activities (PPKM) are indeed very difficult for community mobility, both socially and economically. However, this situation, on the other hand, actually makes the digitalization transformation more developed in all aspects of Indonesian people's life; this can be seen from the tendency to increase the way people socialize and communicate with people who switch to using digital media.

The change in people's lifestyles without exception also the millennial generation in using the internet, making them more choices in fulfilling their needs independently, even though the options made are often inaccurate and endanger their health, for example in choosing food products, especially fast food (junk food).

The millennial generation's choice of fast food is not only for heavy meals but also for snacks such as bread, cookies, cakes, contemporary coffee, soda, boba drinks (Kompas.com, 2020). Whereas based on research, consumption of fast food with high energy levels is one of the factors that can cause overweight or obesity (Ika Pamela, 2018). Fast food can increase the risk of several diseases, such as obesity, diabetes, hypertension, and blood fat disorders or dyslipidemia. In addition, fast food will also affect dental health for a long time. Fast food with high sugar content can cause dental caries or cavities (Octavia, L.I., 2018).

Riskesdas 2018 data shows that Indonesia has three nutrition-related problems (triple burden): stunting, wasting and obesity, and micronutrient deficiencies such as anemia. If detailed, it will be obtained data that 25.7% of adolescents aged 13-15 years and 26.9% of adolescents aged 16-18 years with short nutritional status. Then there are 8.7% of adolescents aged 13-15 years and 8.1% of adolescents aged 16-18 years with thin and very thin conditions. At the same time, the prevalence of overweight and obesity is 16.0% in adolescents aged 13-15 years and 13.5% in adolescents aged 16-18 years.

The data shows that teenagers or millennials have problems with nutrition. The emergence of nutritional problems occurs because of errors in determining or choosing food and beverage products. Nutritional problems that arise, which can be undernutrition or overnutrition, can undoubtedly increase susceptibility to disease, especially the risk of non-communicable diseases and infectious diseases such as COVID-19. Therefore, preventing the transmission of COVID-19 requires medicine or vaccines and, of course, the fulfillment of safe, quality, and healthy nutrition and nutrition, because good nutritional intake will undoubtedly increase the human body's resistance. Consumption of safe, quality, and nutritious food is essential in maintaining body resistance.

In a pandemic like today, the body's resistance becomes a person's strength as a preventive effort not to contract COVID-19. Nutrition and health issues are still the main things to fend off various problems with the spread of COVID-19. The nutrition and health problem is intended as a solution to anticipate the spread of COVID-19. Fulfillment of nutrition, safe quality nutrition, and good health for the millennial generation, of course, is very much needed and beneficial for the millennial generation to prepare them to grow up.

Good nutrition and nutrition are the foundation for every individual to reach their maximum potential. The millennial generation demands fulfilling nutritional needs to achieve full growth potential because nutrition and growth are integral. Therefore, if nutritional problems arise in the millennial generation, it will undoubtedly cause a decrease in academic potential a reduction in work capacity and productivity now and in the future. This aligns with the current direction of health development which focuses on promotive and preventive efforts. These efforts are considered to provide a broader and more efficient health impact from an economic perspective, especially in welcoming the 2045 Golden Generation.

Based on the above, it is appropriate for the millennial generation to get correct, precise, and accurate knowledge and information about food products, especially fast food that is safe, quality, and healthy. The problems discussed in this study will first discuss why the millennial generation is interested in fast food products during the COVID-19 pandemic and what forms of legal protection for the millennial generation against the dense junk food circulating during the COVID-19 pandemic. The problems that will be discussed are used to answer the purpose of this study, namely to find out and analyze the provision of legal protection for the millennial generation against the rise of junk food circulating in society today.

Research Method

This research is descriptive with normative juridical research, supported by empirical data. The primary data used is secondary data in primary, secondary, and tertiary legal materials obtained through library research and document studies to obtain actual and comprehensive data. Primary data in the form of in-depth interviews are used to explore legal protection for the millennial generation against the rise of junk food during the COVID-19 pandemic to obtain actual, reliable, and comprehensive data. The interview was conducted on 100 respondents, namely those categorized as millennials. This study will analyze all data using an interactive descriptive analysis method. This analysis is used to get an overview of legal protection efforts for the millennial generation against the rise of junk food during the COVID-19 pandemic. The results can be used as a guide for the development of further research. In conducting interactive descriptive analysis, the researcher moves between data collection and presentation. Each data collection stage is analyzed to ensure data deficiencies can be immediately identified so that this analysis continues until the data collection stage is complete.

Discussion

A. The millennial generation's interest in junk food during the COVID-19 pandemic

Recently, the world has been shocked by the outbreak of the COVID-19 virus, which is said to be able to spread quickly from one human to another. This has caused WHO to set this

virus to be a pandemic status, a disease that has spread rapidly to various regions. A pandemic does not show how vast the area is but how fast the transmission process is. To anticipate the process of spreading, the government has also taken various actions that are advised to all levels of society. One of them is social distancing, where people are prohibited from gathering in crowds and even to keep themselves from being infected; without exception, millennials are also advised to maintain a minimum distance of one meter from other people. This causes millennial activities to go out of the house to be limited. Social distancing also affects the economic market system of demand for an item.

Currently, market demand for goods that support this pandemic has increased sharply, such as masks, hand soap, gloves, hand sanitizers, and fast food and junk food are no exception. Junk food is a term that describes foods that are unhealthy and have little nutritional value. Junk food is high in fat, salt, and sugar also low in fiber (WHO, 2011). Junk food is another word for foods that have limited amounts of nutrients. Foods included in this type are potato chips that contain a lot of salt, candy, sweet desserts, fried fast food, and soda drinks or carbonated drinks (Anggraini, 2013).

Some types of junk food often found include (Vinsensia, 2011): 1) Foods with preservatives such as food stored in cans, noodles sold in packages, and cans. All foods of this category are certainly dangerous because of their preservatives. 2) Foods containing high levels of salt and MSG, such as snacks. This type of food is suitable and delicious for a snack. However, because it contains high levels of salt and artificial flavors, it will inevitably affect a person's health both in the short term and long term. 3) Foods that contain high fat, such as meat in burgers. 4) Foods that contain soda, such as soft drinks and lots of chicken skin, are sold in fried chicken and others.

The demand for junk food during the COVID-19 pandemic has increased and spiked up to 3 times than usual. This is because the process of serving junk food is fast and uncomplicated. In addition, this COVID-19 pandemic has brought changes to the lives of young people/millennials, and this is interesting to discuss. Many teenagers or millennials use their free time to access the internet and do other inactive activities. Even though they have other daily activities, they still take the time to determine the food they want to order to enjoy. These millennials spend a lot of their free time eating snacks. In other words, the impact of COVID-19 has increased the opportunities for teenagers not to do physical activity because they use the available time to complete school assignments online, access the internet, and consume snacks.

This, of course, can cause new problems that can occur in adolescents. The nutritional status that happened during the pandemic resulted from changes in the habits of previous adolescents, especially in eating habits. It turns out that the millennial generation's choice fell on fast food to meet their needs, as revealed from an Economic and Social Research Institute (ESRI) study revealed that some young people and children have turned to fast food (junk food) and sweets to cope with bad moods during the COVID-19 pandemic (Republika.co.id, 2021). The results of Amaliya's research (2021) show that adolescent diets also consume snacks during the COVID-19 pandemic to prevent boredom. Respondents consumed these snacks three times a day at 15.00-18.00 WIB. The type of snack food that respondents often consume is salty snack food (such as chips and fried foods), with a percentage of 35%. Below will also display a table of food choices for the millennial generation.

Types of Food	Total	Percentage
Junk food	60 people	60 %
More than one characteristic of food	26 people	26 %
Healthy food	14 people	14 %
Total	**100 people**	**100 %**

Table 1. Choice of Food (Source: primary data)

Based on the table above, it can be seen that from 30 respondents, the results obtained that the majority of the food characteristics selected by respondents when using online-based food ordering services during the COVID-19 pandemic were junk food as much as 60%, others (containing more than 1 characteristic of food) as much as 26%. The least is healthy food, as much as 14%.

Based on the table above, during the COVID-19 pandemic, it can be concluded that the millennial generation consumes more junk food than healthy food. However, suppose you look closely, apart from the COVID-19 pandemic, which requires everyone to stay away from crowds and carry out their activities from home. In that case, it turns out that the millennial generation's interest in junk food products is influenced by several factors, as discussed below.

a. Peer Influence

The influence of peers for teenagers, who are currently referred to as the millennial generation, is enormous because it is driven by a high sense of solidarity between them. This, of course, also affects the way they choose the food products they consume, such as a study conducted by Nusa that the invitation of peers is one of the factors that influence teenagers in choosing junk food and fast food compared to other foods (Nusa, A.F.A. & Adi, A.C., 2013). In another study, peer invitations were also the cause of the high consumption of fast food in adolescents, even though these adolescents knew the potential dangers of consuming fast food for health. Teenagers prefer to eat with their peers than eat at home, which causes teenagers to have bad eating habits (Mustikaningsih, D., Hartini, T.N.S. & Syamsiatun, N.H. 2015).

b. A junk food restaurant is a comfortable place to hangout

A relaxed and comfortable restaurant or place to eat, with an attractive layout, equipped with free wi-fi, is usually a gathering place for family or friends, this is the main attraction for the millennial generation to enjoy fast food (Septiana, P., Nugroho, F.A., & Wilujeng, C.S. 2018). The convenience of the place and the complete facilities needed by the millennial generation make fast food restaurants a choice of gathering places but sometimes also a place to do school or college assignments. This causes the frequency of fast food consumption in the millennial generation to be high. Based on this, a comfortable place becomes one of the attractions for consumers to eat at fast-food restaurants. Apart from being a comfortable place, the strategic position of the restaurant also affects the high consumption of fast food among teenagers, such as the location close to their school (Mustikaningsih, D., Hartini, T.N.S. & Syamsiatun, N.H. 2015). Close or long distances do not affect respondents not to eat fast food because their primary reason is to get a comfortable place (Nusa, A.F.A. & Adi, A.C. 2013).

c. Fast and Practical Service

The millennial generation is interested in choosing fast food because their time is limited, so speed and practicality influence people to consume it (Khairiyah, E.L. 2016). Fast food is also the choice of parents who have a lot of busyness. Fast food because the process of making it using a machine so that it is fast, always available, and looks clean (Setyawati, V.A.V. & Rimawati. 2016). This speed and practicality are the reasons the millennial generation chooses fast food regardless of quality and food safety.

d. Fast food brand

A brand is also a factor that influences someone in consuming fast food. The millennial generation tends to consume food with a well-known brand or brand as self-expression in association and becomes a prestigious event. The thing that is becoming a trend in today's millennial generation is taking selfies at restaurants with fast food brands that can only be shown to their friends through social media. This indicates that they have visited and eaten at restaurants with that brand.

e. Advertisement

Advertising is a promotional media for business actors to offer the products they have so that business actors make advertisements in such a way both in terms of appearance and the frequency of displaying these ads, mainly through social media such as Instagram, Facebook, Twitter, where social media is also familiar to the millennial generation. This, of course, also has a significant influence on the millennial generation, so they choose to consume fast food.

f. Low price

Low prices and large portions offered by fast-food products affect consuming fast food. In addition, the existence of discount offers through a thrifty package strategy provided by fast-food restaurants has turned out to be an attraction for the millennial generation to buy and consume fast food. The purchase of fast food products undoubtedly follows the amount of pocket money given by parents to their teenage children.

g. Good taste

The public generally likes fast food and junk food, including teenagers, because they think they have good taste (Pratiwi, 2018). Teenagers who are used to eating fast food believe that fast food is easy to get and has an excellent taste to arouse appetite (Mustikaningsih, D., Hartini, T.N.S. & Syamsiatun, N.H, 2015). Factors that cause fast food to have a good taste are due to the high content of oil, salt, and sugar, as well as the presence of monosodium glutamate (MSG), fat and addictive substances, are added, and this causes addiction to the delicious and savory taste regardless of the dangers that threaten behind the delightful flavor.
If you pay attention if you overeat junk food, it will harm your health, including:

a. ***Nutritional Deficiency***

Processed foods are deficient in nutrients compared to fresh foods. In some cases, synthetic vitamins and minerals are added to fast food to compensate for the nutrients lost during processing. These synthetic nutrients are certainly unhealthy compared to natural nutrients from fresh food. Therefore, if you often eat processed foods, you will get little vitamins, so that it can cause nutritional deficiencies and get sick easily.

b. ***Causes of Constipation***

Junk food also does not contain fiber and, on average only contains fat. This is because the fiber contained in junk food is usually lost during processing. Fiber is essential for human digestive health because the fiber consumed will facilitate digestion. Without an adequate amount of fiber, of course, you will be very prone to constipation.

c. ***Leads to Obesity***

Junk food is often high in unhealthy fats due to its processing using seed oil and vegetable oils easily hydrogenated into trans fats. Vegetable oils are very harmful, especially when added to meats already high in fat content. Vegetable oils contain omega-6 fatty acids, which can promote oxidation and inflammation in the body if consumed in excess.

d. ***At the risk of serious illness***

Junk food is usually loaded with added sugar. Consuming too much sugar can be dangerous because it can interfere with metabolic processes. Excess sugar consumption can lead to insulin resistance, high triglycerides, increased levels of harmful cholesterol, and increased fat accumulation in the liver and abdominal cavity. As a result, a person who consumes excessive amounts of sugar is at high risk of heart disease, diabetes, obesity, and cancer.

e. ***Addiction***

Consciously or not, consuming junk food or other fast food can be addictive. It was launched from Medical News Today; preservatives contained in fast food trigger dopamine release in the brain of someone who eats it. That is why someone who often eats fast food can become addicted to continue eating it.

Because of the various impacts caused by frequent consumption of junk food for the millennial generation, as research conducted by Zulfa (2011), then it is appropriate if the millennial generation as the nation's successor has the knowledge and is aware of the health of his own body because getting and obtaining health is the right of every citizen which is protected and regulated by law.

B. Forms of Legal Protection for Millennial Against the Rise of Junk Food Circulating During the COVID-19 Pandemic

Legal protection is an act that protects legal subjects as supporters of the rights and obligations in carrying out various legal actions. The law was created to regulate the rights and obligations of legal subjects and serves as an instrument of protection for legal subjects. It can also be interpreted as a place of refuge from everything that threatens. The law is used to protect the interests of human life (Sidharta, 2006). So, the law functions to protect human interests (Sudikno, 2013).

If you pay attention during the COVID-19 pandemic, apart from the need for drugs and supplements to support health, namely a healthy condition, both physically, mentally, spiritually, and socially that allows everyone to live socially and economically productive as regulated in Article 1 point 1 of the Law No. 36 of 2009 concerning Health, of course, healthy food is also the primary need of a human being to survive the attack of the virus.

Healthy food is the right of every citizen (the right to food) which has been recognized internationally as one of the fundamental rights of humankind. Therefore, the state is obliged to provide adequate food, both in quantity and quality, for the entire community to meet a decent standard of living. The regulation of healthy food is as regulated by Law Number 18 of 2012 concerning Food (Food Law) which emphasizes that the fulfillment of basic needs

for healthy food is part of human rights guaranteed in the 1945 Constitution of the Republic of Indonesia as a component basis for realizing the quality of Indonesian people.

Healthy food can be obtained if the food product is safe and suitable for consumption, meaning that food does not contain the possibility of biological, chemical, and other contaminants that can interfere, harm, and endanger human health and do not conflict with the religion, belief, and culture of the community.

The implementation of Food Safety is carried out to protect the people from consuming safe food for their health and mental safety. This is in the opinion of Satjipto Rahardjo, which states that the law protects human rights that are harmed by others and that protection is given to the community so that they can enjoy all the rights granted by law (Satjipto Rahardjo, 2000). Human rights are the formation of society, the result of cultural construction. Human rights exist because of human rights. Human rights are part of human rights.

Furthermore, to ensure that the available food is safe and suitable for consumption, food safety must be implemented along the food chain, starting from the production (cultivation) stage, harvesting, processing, storage, distribution, circulation until it reaches the consumer. Production activities or processes to produce safe food for consumption along the food chain are carried out by applying safe food requirements.

Therefore, it is proper for everyone who produces and trades food to have an obligation to meet safety standards, including provisions regarding: a. Food Sanitation, b. Food Additives, c. Genetically Engineered Food Products, d. Food Irradiation, e. Food Packaging, and f. the use of other materials and food quality standards in the form of essential characteristics of Food Quality according to the type of food in normal conditions based on organoleptic, physical, composition, and/or Food Nutrient content. The Food Quality Standards can be determined by preparing the Indonesian National Standards (SNI).

In addition to that, food safety and quality standards must be guaranteed. Before being circulated, any processed food produced domestically or imported for retail trade-in packaging must have a distribution permit, except for certain processed foods produced by home industries. In this regard, the government is obliged to carry out supervision so that if there are people who violate this, they will be subject to administrative sanctions in the form of: a. fine; b. temporary cessation of activities, Food Production, and/or Food Distribution; c. withdrawal of Food from Food Circulation by producers; d. compensation; and/or e. license revocation.

The provision of sanctions for people who violate is intended as preventive legal protection which aims to prevent problems or disputes from occurring. The legal protection carried out by the government in the form of preventive legal protection, according to the author, has not been fully implemented.

Opinions given by the community can help the government to establish legal protection in the form of legislation. In the author's problem in this paper, the millennial generation as consumers needs to express their objections about buying and selling junk food online during this COVID-19 pandemic. The legal protections provided by the government has not fully discussed safety, quality standards, and distribution permits for junk food products, especially in the Consumer Protection Act, because the objections given by the community can be used

as a reference for the government to make regulations according to what the community wants.

In addition to preventive legal protection, the government also provides repressive legal protection in the form of law enforcement for anyone found guilty. Suppose the millennial generation feels that fast-food business actors have harmed them. In that case, the millennial generation can complain to the Consumer Dispute Settlement Agency (BPSK) is regulated in Article 49 of Law No. 8 of 1999 concerning Consumer Protection. BPSK is an agency formed by the government to resolve consumer disputes outside the court. This non-litigation dispute resolution is a form of repressive legal protection from the government, although currently, many BPSKs are suspended. Legal protection for consumers is vital, so the regulation in some of these laws needs to be further analyzed by the government to strengthen regulations regarding consumer protection, especially in the sale of junk food that does not meet food safety and quality or does not have a distribution permit that sold online.

Conclusion

During this COVID-19 pandemic, many millennial generations have chosen junk food products because junk food is fast in serving and tastes good even though it contains many harmful ingredients for the body that the millennial generation is not aware of. Therefore, the government provides legal protection for generations as the nation's next-generation for the fulfillment of food consumption that is safe and does not endanger health and life through various regulations such as Law No. 12 of 2018 concerning Food, Government Regulation No. 86 of 2019 concerning Food Safety and Law No. 8 of 1999 concerning Consumer Protection. The government makes these regulations intending to provide legal protection both preventively and repressively. This legal protection is critical, so the regulation in some of these laws needs to be analyzed further by the government to strengthen the regulation regarding consumer protection, especially in the sale of junk food that does not meet food safety and quality or does not have a distribution permit.

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Integrating Culture in Language Teaching

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
For years, scholars have searched remedies to the inadequate treatment of the role of Culture in Foreign Language Education. On one hand, course book and syllabus designers treated language and culture tasks separately. Some go as far as to place culture at the "core of language instruction", whereby the ultimate goal is cultural awareness and intercultural communication competence (Tran-Hoang, 2010). On the other hand, ESL research argues that focusing primarily on culture in language classrooms runs the risk of undermining the last 40 years of SLA research. The 2017 National Curriculum Revisions in Japan labelled Communication Competence as one essential life skill. Curriculum is challenged and "interaction" has become the key element in language and communication (Kubota, 2019). Although recent trends show that scholars and educators have come to embrace the natural interdependence of language and culture (Ennis, 2015), culture teaching has left much to be desired. An extensive review of literature reveals related problems include instructors' negative attitudes, ineffective instruction and absence of academic support for teaching culture. This presentation suggests an interdisciplinary approach to the teaching of Communications that help create a powerful learning experience emphasizing integrative learning and heightened student engagement. The goal is to show that by carefully selecting culture content and tasks, and maximizing student engagement through classroom interaction, culture learning can be fully integrated into communication classes. This careful integration exemplifies the case "inside a white box there are two black boxes wanting to come out."

Keywords: Culture Awareness, Language Acquisition, Integrated Instruction

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Introduction

The first part of this paper discusses research findings and issues related to the general theme of this research. The second part highlights issues that hope to provide the foundation and existence for a pedagogical integration of cultural elements into the teaching of English as a second or foreign Language.

Review of the Situation

To start with, what role should Culture play in the ES・EFL Curriculum? How should it be defined? How should it be taught? These and other questions have been raised time and again over the years, yet no real consensus has emerged and certainly no simple answers" (Furstenberg, 2010). For decades, scholars have searched remedies to the inadequate treatment of the role of culture in Language Education. Course books and syllabus designers have treated language and culture tasks separately. However, the truth of the matter is the intrinsic relation between these two is what Douglas Brown describes:

> A language is a part of a culture, and a culture is part of a language;
> the two are intricately interwoven so that one cannot separate one from
> the other…without losing the significance of either language or culture.
> (2011)

Here are a few examples of the continuing dilemma and attempts to resolve the issue. The publication of *"Theory and Practice in Language Learning*" in 1960 triggered the interest on the field of teaching culture in second of foreign language education, and started a discussion on the topic.

Four decades later, *Standards for FL Learning* (1996) listed culture as one of the five goals of learning a foreign language. Since then, language educators and scholars have generally recognized the importance of culture education, and the teaching of culture has become an indispensable part of teaching language. Some go as far as to place culture at the "core" of language instruction, whereby the ultimate goal is cultural awareness and intercultural communication competence (Tran-Hoang, 2010).

The importance of culture and culture perspective was never more obvious than when ACTFL defined the national standards in 2006 with the 5C's: Communication, Cultures, Connections, Comparisons and Communities in learning a foreign language. Culture was included with its closely interrelated components: the tangible and intangible elements of a society.

> Students demonstrate an understanding of the relationship between
> the practices and perspectives of the culture studied.

Researchers and scholars (Schulz, 2007) have argued that the objectives for learning culture should move beyond simple "culture as fact" and should aim at gaining different cultural perspectives such as worldviews, values and beliefs.

Despite these efforts however, the inclusion of culture in language instruction remained an unresolved issue. Foreign and second language teachers have been confronted with many problems in teaching culture. Lange and Paige indicated that "In most language courses there is a focus on language skills, but cultures are overlooked. Yang and Chen (2014) refers to some of these as:

1. Instructors' negative attitude toward the teaching of culture.
2. The lack of effective instruction, resources and technology.
3. The absence of academic support for teaching culture.

Language skills have become the focus of language instruction; culture has been overlooked. Thus, although recent trends showed that scholars and educators have come to embrace the natural interdependence of language and culture, culture teaching has left much to be desired. The upshot of these several complex problems is the inherent interconnectedness of language, culture and communication.

Discussion

This paper suggests an alignment of two strands in the use and development of content and materials for the teaching of both. It proposes defining the levels of culture based on Ennis' Integrated Approach (2015) and aligning them with the different stages of second language acquisition for an integrated classroom instruction. In the next section, culture and its components are first discussed, followed by a review of the stages of second language acquisition, along with how to carefully blend aspects of both to achieve integration.
To start with, I reconsider Edward Hall's Cultural Iceberg Model representing his iceberg analogy of culture. "If the culture of a society was the iceberg, Hall reasoned, then there are some aspects visible, above the water, but there is a larger portion hidden beneath the surface (1976)."

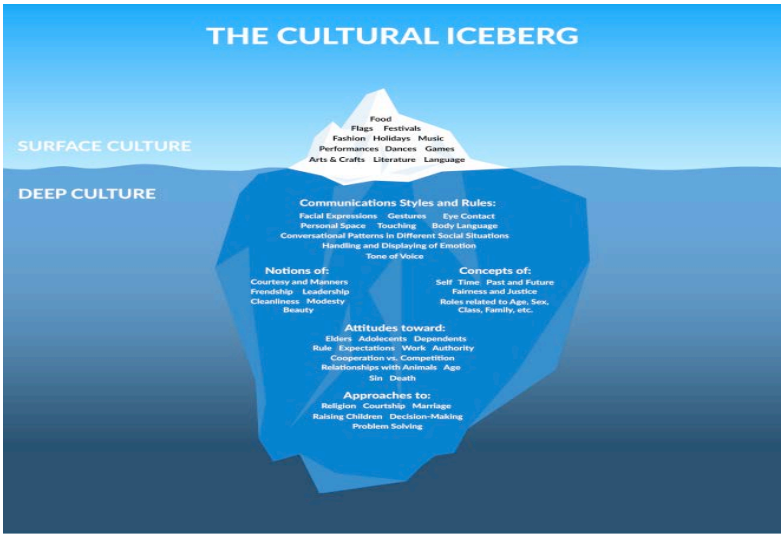

Figure 1: The Culture Iceberg Metaphor

The external, or conscious, part of culture is what we can see and is the tip of the iceberg and includes behaviors and some beliefs. The internal, or subconscious, part of culture is below the surface of a society and includes some beliefs and the values and thought patterns that underlie behavior.

Hall's categorization of the external, or the conscious part of culture which is visible on the iceberg, and the internal, or the subconscious part of culture which is below the surface level was subsequently modified in Schein's representation below.

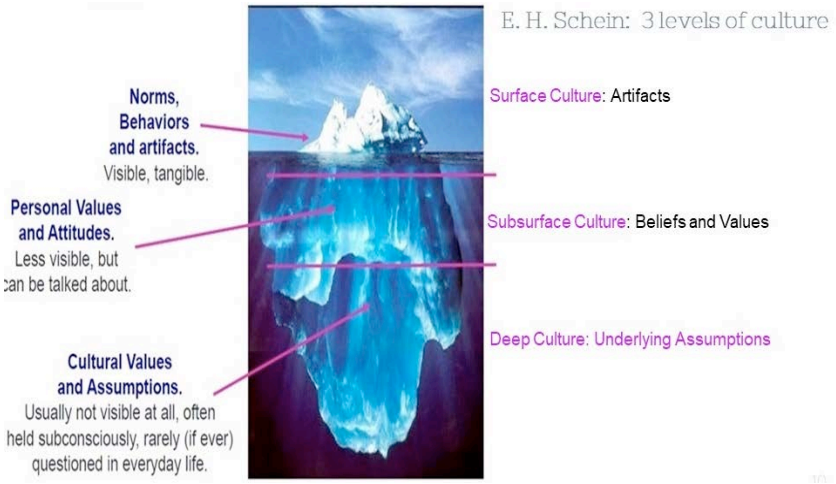

Figure 2: The three levels of culture

Schein defines the three levels of culture as Artifacts, Beliefs and Values, and Basic Underlying Assumptions. These three divisions align well with the different levels of culture iceberg.

Another way of viewing culture which implies concepts of surface and deep culture is the 3P's, which has been expressed in the image of a triangle. Cutshall labels Products as the items required by underlying beliefs and values of a culture, such as food; Practices as the patterns of social interaction or behavior accepted by society, such as rituals and social discourse, and Perspectives as "that culture's view of the world" including the people's attitudes and values. Each division is dependent upon the other, and can pose potential trouble for those studying a foreign language.

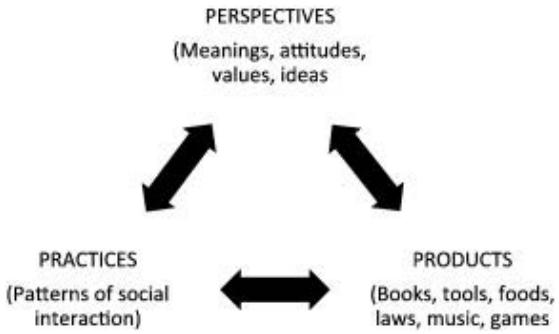

Figure 3: The 3P's: Products, Practices and Perspectives

Culture understanding and the journey to language learning

The concepts discussed above can be helpful in determining the content of culture instruction and the methodological planning of what to teach when depending on student readiness. The problem is, culture does not simply take on one form. It covers all the tangible symbols and observable behaviors down to the deeper meaning of these symbols including beliefs and values. Which aspects comes in the early stages of language learning? The surface level is easy enough to teach: national costumes, dances, national dishes, festivals, sightseeing spots and so on. These come in colorful illustrations in ELT textbooks and videos. How can the deeper surface of culture translate into language instruction?

Another vital question is the timing involved. One suggestion has been that it should be put off until the students had a firmer grasp of the fundamentals of language they are learning. It is in the latter stages of fluency and mastery, where the deep aspects of culture can become a rich source of culture learning in the classroom. This paper argues in favor of the opposing point of view; that since culture is a gateway to language, holding off cultural topics is a mistake. Effective integration of culture learning depends on the careful sequencing of its content and the skillful infusion in the language instruction. This is the focus of the next section.

Teaching culture elements in the different stages of ESL acquisition

This research suggests that successful integration of culture and language calls for conscious awareness of the surface and deep elements, as described in the Culture Iceberg metaphor, alongside the stages of language acquisition. Let us first review what students can do in the different stages of ESL acquisition.

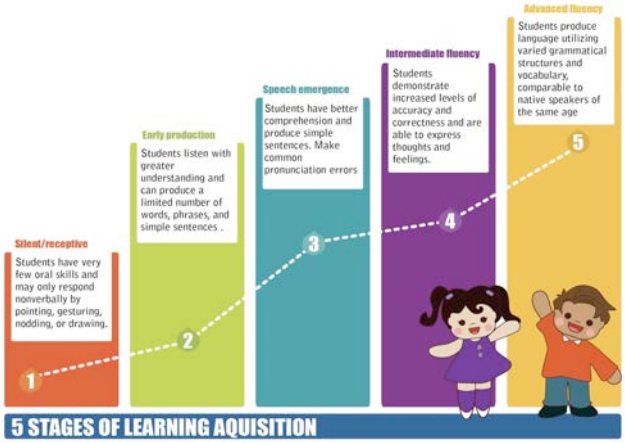

Figure 4: The Stages of ESL Acquisition

Although instructors cannot expect culture appreciation, nor culture discussion, in the silent-receptive stage, the early stages of language learning, cultural components can be used to introduce new vocabulary and grammar points, or to explain certain language formations. At this stage, reading passages in the target language should introduce students to the surface elements of the culture of the target language.

By the time students get to the stage of speech emergence and production, they are ready for basic communication by combining words into phrases and short sentences. Language instruction can gradually introduce the visible patterns of cultural behavior as part of language practice. Students can probably start imitating and applying language rules of the target language.

In the latter stages of fluency and mastery, the deep aspects of culture can become a rich source of culture learning. When students are able to communicate in complex structures in the target language, they can discuss reasons for differences in cultural behavior. Learning different non-verbal communication behavior is an important communication topic. Students can compare why “avoiding eye contact” is accepted in Japan, and not in the US. Culture instruction can now go deeper into the subsurface culture and students compare social patterns of behavior. They are now able to understand why interrupting a teacher in the midst of a lecture is hardly acceptable in Asia, while silence is abhorred in most Western societies.

Similarly, silence of Japanese students is commonly interpreted as indifference, and incomprehensible to teachers of other culture background.

When students have developed second language competency, teaching and learning cultures can be both interesting and challenging. When students have gained mastery of the target or second language, teachers can expect awareness, appreciation and dialogues focusing on the perspective element of the 3P's. Textbooks and lectures are not merely to supplement the language component but also to complement it; language learning is incomplete without culture learning.

Conclusions

This paper has discussed ways toward an effective careful integration of culture and its elements into the language classroom by aligning the two strands of culture iceberg and stages of second language acquisition, emphasizing integrative learning and heightened student engagement. A careful integration "carefully selecting culture content and tasks according to Stages of ESL Acquisition" exemplifies the case Ennis (2015) identifies: "Inside a white box there are two Black boxes wanting to come out."

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Recruiting and Managing Volunteers for Academic Libraries: Tips and Suggestions for Running Successful Programs

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Unlike public libraries, academic libraries are not normally seen as organizations that make utilization of volunteers to help. Yet, many academic libraries do indeed use volunteers for special projects, programming such as events, and some day to day operations. Volunteers means dealing with people and it comes with multiple obligations to the library including legal and ethical implications and impacts. This paper will look at the literature that deals with libraries and how they interact with volunteers including literature specific or directly applicable to academic libraries. It will look at legal implications relating to volunteer working conditions, screening, and equal opportunity. It will review reasons people volunteer, recruitment, and how to use that in any academic library volunteer program. It will also examine training and daily management of these volunteers and how to connect volunteer service to library development efforts in fundraising.

Keywords: Academic Libraries, Higher Education, Library and Information Science, Volunteers, Diversity, Management, Fundraising

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Introduction

Although not extensively covered in the library or education literature, academic libraries in higher education have been making use of volunteers for centuries. For a variety of reasons, some individuals wish to give of their time to support the mission of an academic library. They may be students, employees or retirees of the institution, or members of the local community. Regardless of the reason, working with volunteers means working with people and that includes all of the normal rules of managing people in a library with additional considerations also being brought into the mix.

Recruiting volunteers is a big step. This is especially true when a library has no or limited volunteers engaged in the past. The smaller the library and institution, the more difficult it may be to find volunteers However, when given the opportunity, many sign up to volunteer on their own. Learning where to look, what to look for, and how to recruit volunteers is an important skill for academic librarians to have.

In many cases, time donations are equally if not more valuable than monetary donations. Many people are willing to contribute many hours to an academic library for free, even when they would charge a high hourly rate for those same services. Although the expression differs, volunteers donate their time for the same reasons they donate their money. They want to be involved, they want to help, and/or they feel strongly about the work of the library.

Working with volunteers also opens up avenues for fundraising. If a person will volunteer, they may well be willing to donate to the library. If they have the interest in a library, and have a good working experience volunteering, cash donations may follow. Even if they do not, the good word the volunteers spread may attract other donors who may have capacity and willingness to give significant donations.

This paper will be broken into several parts. To begin, what exactly does the current literature say about recruiting and managing volunteers in libraries? More specifically, how does it address it in an academic setting? It will then look at legal considerations. In particular, this will review screening of volunteers, the eligibility of volunteers, and their working conditions. The paper will then review how an academic library would go about finding (and understand the motivation) of volunteers. It will also look at the practicalities in volunteer management. It will conclude with a look at fundraising and library volunteers.

Literature Review

The majority of library literature dealing with library volunteers focuses on public libraries. This review will begin by looking at some of this literature before moving into areas dealing more specifically with academic libraries. This paper will be kept to a reasonable size with readers encouraged to review the literature for more examples that may fit their own experiences and needs.

Schmidt (1973) provided a guide which suggested ways the public library could use volunteers to expand library services. This included a bill of rights for volunteers, a list of five libraries with successful volunteer programs, and 10 suggested readings. The author wrote, “The library should plan to its volunteer program and develop job descriptions for the volunteers. Then volunteers can be recruited through advertising or community organizations. Volunteers can

be trained through pre-service workshops, on-the-job training, or role playing. The library must make someone responsible for coordinating and supervising volunteers." (p. 1).

One earlier author noted how volunteering was suited well for older volunteers. It gave a large potential group of library patrons library activities to support the overall mission. Adams (1979) wrote, "Library services to the elderly should consist of a needs assessment followed by collection development, and cooperative efforts with community agencies. The elderly community should be considered as library volunteers, as members of advisory groups, and as a community resource." (p. 287).

Roy (1988) wrote about public library volunteers in Illinois. The abstract noted, "Fifty-two public libraries in Illinois were surveyed to test an instrument measuring volunteer use. Ninety-eight percent of the libraries returned completed questionnaires. Results indicate that volunteers are currently used in (57% (34) of the libraries within this group, an increase in the level reported in earlier studies. Demo- graphic data is used to construct profiles of the libraries using volunteers and those not using volunteers. Survey findings identify rea- sons for using or not using volunteers, list the types of activities that volunteers perform, and describe characteristics of existing volunteer programs." (p. 127).

Walter (1987) examined how managers in a large library system created meaning and developed roles for conducting cooperative activities with citizens for the delivery of library services. The author wrote, "The data indicates that there are a variety of roles performed by citizens which vary in how successfully they are integrated into the organization from the perspective of managers. Significant differences are found between citizens in the role of service providers and fund raisers, in whether their relationship is with the central library administration or branch libraries and in whether the style of a manager is flexible or bureaucratic." (p. 22).

Wedel (1990) wrote of the similarities to library volunteers to other types of volunteers. The author emphasized, "Volunteers can and should be an important part of every nonprofit organization. This is not only to save money though it can do that but because it is a right of people to have an active share in those institutions which are supported by their tax or philanthropic dollars. The volunteer portion of our society is undergoing some dramatic changes today which offer new challenges and many new opportunities to all organizations which are alert to what is happening. I don't know a great deal about the detailed operations of libraries (although I worked in one at one time), but the basic principles of volunteer participation and management, I am sure, apply to libraries as they do to hospitals, school systems, and social welfare agencies. To understand these changes, we must look at what is happening to people today which has an effect on volunteering." (p. 91).

A broader (and now into the 21st Century) was given by Nicol and Johnson (2008). They wrote, "Volunteers have had a major impact on libraries throughout U.S. history. The rapid changes in the information world of the last decade serve as a catalyst for evaluation of library programs including those for volunteers. This article offers a brief history of volunteers in libraries and discusses some of the advantages and disadvantages of instituting a volunteer program as well as implications based on library implementation of new computer technologies. The authors argue that a robust volunteer program will help a library in developing a consultation model of communication, thus providing more effective public services." (p. 154).

School libraries also use volunteers. Snyder (2009) wrote, "Parent volunteers can be an important asset to a well-run school library. Parent volunteers are that extra pair of hands and extra eyes. Monotonous and even tedious tasks can be accomplished quickly by people searching for ways to spend a little time with adult conversation while providing a benefit to their children. And eventually they can become a sounding board as needed when district employees (faculty and administration) attempt to gain an understanding of the opinions of the general public. This article offers tips for recruiting parent volunteers." (p. 22).

Evans (2010) looked at the bigger pictures for using volunteers in any type of library. The author wrote, "There are, however, challenges regarding if, when, and where to make use of the people who volunteer. In past, a library might have been highly selective in what tasks it allowed volunteers to engage in; today there is real pressure to expand the roles they play in the daily operations. There is a vast pool of talented energetic and motivated volunteers to tap into and, hopefully, retain. Volunteers can become highly committed to a library's organizational goals, given the proper environment, even if they never worked in a library. Part of that environment is thinking about volunteers as just as important to quality service as any paid staff member."

The failure of some academic library volunteer programs was addressed by Tikam (2011). The author claimed, "The Library Volunteerism Program strengthened the library-student bond. Though the student volunteers felt satisfied about making an important contribution to the organisation, they rarely found it personally fulfilling. The volunteers expected more substantial outcomes and flexibility from the Library Volunteerism Program."

There are dozens of other quality articles dealing with public libraries and volunteers. However, the article will shift to academic libraries and volunteers. Forrest (2012) sums this up nicely. The author wrote, "Volunteers have contributed successfully to the work of public and school libraries since time immemorial and there are many examples of libraries, especially for patients in hospitals which would not function without the support of volunteers. Academic libraries on the other hand have been more selective in their use of volunteers and fewer case studies are available." (p. 1).

Most libraries have a Friends group. Reitz (2004) defined a Friends group as "an organization whose members share an interest in supporting a particular library or library system through fund-raising and promotional activities" (p. 299). While most common in public libraries, many academic libraries have them as well. They can be the source of both free volunteer time and of funds.

Schobernd, Tucker and Wetzel (2009) wrote about "Closing the Gap" which was s a volunteer program started by the Student Government Association of Illinois State University, allowing the library to stay open longer hours to meet student needs. The program was a collaborative effort between Milner Library and student leaders to bring in student volunteers from across the student body. The article outlined how the program began and how it worked, including recruiting volunteers, training, and scheduling. In addition, lessons learned along the way were shared.

Anders, Graves, and German (2012) wrote about student volunteers in academia. They wrote, "The university library's orientation program has successfully leveraged student volunteers to scale a large outreach program. However, student volunteers have added more than free labor. The presence of student volunteers shows that students are at the heart of the libraries.

Furthermore, the student volunteers were able to participate in learning and leadership opportunities that tie into the educational mission of Texas A&M University and its core values. The use of student volunteers in library outreach programs has been a strategic collaboration of significant importance. We hope to continue to grow this program with more opportunities for student engagement." (p. 29).

Another article from 2012 wrote about archival student volunteers. Leonard (2012) wrote, "Using volunteers is almost certain to remain a common practice within the archival profession. The volunteer internship, connecting the archive to students of a formal curricular program, is well established as key mechanism in training new practitioners. And volunteer labor from other sources, especially from newly minted archivists and from retirees, remains a convenient source of labor for institutions traditionally viewed as long on work and short on staff. Still, real problems relating to recruitment, scheduling, training, and security exist when trying to match volunteer labor to archival needs. Successful integration of volunteers into the archive, meaning a rewarding and productive experience for both the volunteer and the host institution, is not a chance matter of circumstance or a fortuitous alignment of compatible personalities. Forethought and careful planning—to find the best available volunteers, to match aptitudes and interests to work at hand—and appropriate training are essential to achieve positive outcomes." (p. 320).

Roberts (2019) noted that most of the library literature was indeed geared at public libraries. However, there was still much academic libraries could contribute. This was true of work with special collections. The author noted, "With budget cuts facing most academic institutions, many collections go unprocessed and unused without adequate professional staff to process or service them. One group of manuscripts that was of interest to the library had potential interest to a particular group of people in the community. Targeted individuals in the community were solicited to assist as volunteers in processing the collection. This was a successful and creative way to help in a time of financial straits." (p. 207).

Legal Considerations

There are many legal areas to consider with academic library volunteers. These are actually people in your library which you will have obligations. The library will have all the responsibilities of a regular employer. This means that it is up to the library to review volunteers, to provide security and work safety, to follow employment laws, and to ensure that everyone is safe and happy.

The library will need to screen volunteers as if it were intending to hire them. Many companies offer low-cost employment screening. The library can run a criminal background check for free or low cost using many of the research tools it has on hand. It might be wise to work with your institutional human resources office to see what aid they can provide. Check social media posts. If a potential volunteer for example is making questionable posts online, it may be a good indication not accept them as a volunteer.

A criminal record should not disqualify someone from working as a volunteer. However, the library should know whether that person has a criminall history that could affect their work with the library or the people you are helping. Some may not legally be able to work a volunteer job due to local laws. If someone has been involved with financial crimes, they should not handle money. If they have a history of abusive behavior, they should not work with patrons one-on-one. This is especially important when placing volunteers in jobs around children. It

also applies to those working with persons who have suffered from domestic violence or those with an intellectual disability. Some jurisdictions have special requirements for volunteers and employees in these instances. You may need to inquire with your local government body or police to verify. Again, human resources on a campus may be the best place to consult.

If you are finding volunteers to work in skilled positions, you should also ensure that they have valid references and qualifications. It is important to verify the credentials and actually check the references. Can the person do the job they are volunteering for in this case? Mistakes can be very costly and no money is saved if a job is done incorrectly.

It is the responsibility of the library to keep records of when, how, and how often volunteers and employees show up. Many volunteers are requiring to fulfill a course or licensing requirement. In addition, this will help you comply with legal requirements. Some jurisdictions have limits on how many hours a volunteer should work per week. In can also help in recognition for rewards (for example, many libraries offer certificates of volunteer hours and donor recognition events). It also is helpful for ensuring the quality of your volunteers as you can discover who is not showing up or arriving late frequently. While people can do anything they want in their free time, you are still may to place limits on how they use that time as a volunteer in your library and tracking hours helps with that.

Insurance coverage may be an issue. Most institutions of higher education have insurance that covers volunteers in the library. This is many liability or property insurance. If something happens to a volunteer, is the library covered? For example, if a volunteer working on your property were to hurt themselves while normally performing their duties in a safe way, the library might be liable. If the volunteer harms someone while volunteering, is the institution protected? The personal property of volunteers may be damaged while used in volunteering too. Does your institutional coverage apply? The library may be liable if you are not careful.

There are laws in place requiring humane and safe working environments. These apply to library volunteers. This means that your workplace must be reasonably comfortable, employees and volunteers must be able to take breaks, and must have access to food and drinks. The library must also follow all relevant safety regulations and laws. All of this is probably already in place with current employees and patrons but volunteers may create new work situations that need to be assessed.

The library will need to create a volunteer handbook with rules. This will include laying out guidelines, the chain of command, expectations, university policies, and regulations. The library is responsibile to communicate this information. Having this all written down and organized in a meaningful way can be extremely helpful towards ensuring that everything goes smoothly. The library should highlight, basic necessities, regulations, diversity expectations, and policies including statements of nondiscrimination, whistle-blower, human rights (disabled, women's, parents), etc.

Finding Volunteers

There are obvious sources for volunteers in an academic setting. Students may have an interest in library work and may donate time. They also may need to volunteer to fulfill course or organizational requirements for service. Retired faculty/staff may wish to use their ample free time to do something they believe is worthwhile. This may be true for alumni and community members as well. It could be that a specific collection (like Archives) or service (fundraising)

appeals to them and they want to volunteer. Many volunteers will find the library with little prompting. Some retirees are just bored and want something productive to do.

What makes volunteers want to volunteer? Studies show that you get a sort of 'social' high from helping. This is because the brain produces dopamine and serotonin in response to altruistic behavior as reported by Skuse and Gallagher (2009). Volunteering in a community activity makes people feel good. People may want to volunteer in the library because they want to learn, they want to improve their resume, they want to build work experience, and they want to do something good. Some people want to support the library because they believe in what the library does.

A study published in *US News and World Report* (Kurtzleben, 2013) produced the following volunteer numbers:

- Women volunteer more than men – 27% of women in the US volunteer, versus 21% of men.
- 35-44-year-olds have the highest volunteer numbers by age, with 29%. The second highest are 45-54-year-olds, with 28%.
- University aged individuals (20-24) are among the lowest volunteer rates with 18%. (This doesn't seem to hold true on college campuses based on other published studies.
- Teenagers aged 16-19) have a consistently high rate of volunteering with 26.5%.
- Married people are more likely to volunteer than single people.
- Parents with children under the age of 18 were more likely to volunteer than childless individuals.
- 38% of people who earned a bachelor's degree or higher have volunteered, 15% of people with only a high school degree volunteered, and among individuals who have not earned a high school degree, only 8% volunteered.
- Employed individuals are more likely to volunteer than unemployed. Part-time employees have the highest volunteer rates.
- The majority of volunteers commit to only one organization (72%), but 18% divide their efforts between two organizations.
- The types of organizations who have the most volunteer hours worked are: religious groups (33%), education and youth related groups (25%), and community or social groups (14%).
- Among volunteers with children, 45% of women and 37% of men chose to volunteer with education/youth charities.
- The most common volunteer activity is collecting and/or distributing funds and/or resources, followed by tutoring/teaching, strictly fundraising, and general labor.
- Among volunteer activities, men were more likely to perform manual labor tasks, and are more attracted to sports related activities such as coaching, fundraising for local teams, and gathering resources. Women were more likely to tutor/teach, collect resources, and do fundraising
- The percentage of volunteers who joined an organization because they were asked is equal to the volunteers who sought out the organization on their own (41% respectively).

Obviously, the percentages of each group volunteering for any academic library are going to vary based on local conditions. But as noted, there is a spectrum of volunteers who are available even if some demographics are more likely to volunteer than others.

Recruitment will be an ongoing part of your volunteer program. It is difficult to find people who will always be there. Many people volunteer for a few months at most and then move on

to something else. There are a variety of reasons for this. It could be volunteer fatigue. A student may have completed a desired volunteer period. The volunteer may find new opportunities. It may be that simply the volunteer does not have enough time. Or, the library may decide to end the relationship with the volunteer for performance issues. While you will have some volunteers who stick around for the long-term, the library will find that they mostly work with shorter-term volunteers. They receive training, work for a few months, and then are gone.

Your goal is to offer something in return for volunteering. It could be a good reference. It could be training. The more valuable the skills you require, the more you have to offer in return. It could be the volunteer just feels good for doing the work in the library. The number one recruitment strategy is to simply ask. If you know your audience, have something to offer or pitch the benefits of volunteering for the library makes it easy for people to assist the library.

There are a variety of ways to reach potential volunteers. Posting on social media is an easy way to get volunteers. Platforms such as Facebook and Twitter are excellent for letting people know that you welcome volunteers in the library. Use your existing volunteers or library employees to tag friends and family who might be interested and also to share he post on their own social media pages.

Although it may sound dated and archaic, creating flyers explaining what the library needs volunteers for, why you need them, and when can be beneficial. These can be distributed in classes, left on bulletin boards, and given out by many charity organizations in the area. The human resources department on campus may be willing to add this to a list of volunteer activities available to employees on camps as well.

Hosting a volunteer event can help you to meet prospective volunteer. Getting people to the event can be difficult if you don't have a large reach. However, other library events being held like speaker series, book readings, donor events, etc. can allow you to bring up volunteering to a receptive audience.

Word of mouth works well. A library may find this delivers more volunteers than any other method. Let your employees, faculty/staff and campus, and library friends spread the word. The library can ask them to ask around to see if anyone else would be interested, and then ask those people to do the same. Word of mouth is a powerful social motivator.

Organizations vary a great deal from area to are but you can likely easily find a website, organization, or council dedicated to volunteers. For example, many areas have a senior volunteer organization. Just find organizations that look for and recruit volunteers and get your library added to the list.

While the recruitment strategy will help you to reach people who might volunteer, it will be the pitch that convinces them. Be ready to sell the library volunteer program. It might be social media posting or a professor encouraging students but eventually you have to convince the person that they want to volunteer.

Volunteer Management

It is the responsibility of the library to provide adequate training so that the volunteers can safely and efficiently perform the job you are asking them to do. Even if you are bringing in skilled, paid labor such as a mechanic, you should take the time to train them to your computer

system, software, building, etc. While training is time consuming, it will improve the quality of the assistance you receive, especially from volunteers. It will also allow the volunteer to feel more like part of the broader library team.

If your library volunteer program is focused on a specialized aspect of the library (such as archives and special collections), training will eventually focus on that area. You should also provide training on the library culture, image, and goals so they may become good ambassadors for the library. Remember, the volunteers will be talking about the library, library staff, and the work being done to family, friends, on social media, and other areas. You want them to be informed. The library needs them to do a good job representing your brand.

The library must regularly communicate with volunteers. This includes training, role clarification, and directing people in a meaningful way. This is an essential skill for teams and for leaders. The library should be sharing ideas, discussing things in a logical way, and giving instructions. Volunteers should never have to wonder what is going on. Pay attention to the volunteers. Listen when they have problems. Take the time to try to listen to advice and suggestions. This will enable you to make better decisions for the library and to show yourself as a better leader. Listening ensures you can understand the situation, who or what is responsible, and sometimes what you can do about it.

It is important that the library gets to know the members of the volunteer team. Most teams are made up of a diverse range of people with different backgrounds and histories. It is important to take the time to get to know all of the individuals involved. Some people are aggressive go-getters and self-motivated. Others lack motivation and need a great deal of direction. Be sure to understand the psychological and skill capabilities of your volunteers will enable you to make better decisions when assigning responsibilities, when creating leadership roles, and when assigning volunteers or staff to work together. It is OK to even have an informal social event to allow everyone to know each other better. Knowing each other builds trust, which eventually results in working better together as a library volunteer team.

Make sure to put people into the volunteer work environment they enjoy and fit best. People are good at different things. Pome people enjoy working alone. Others like to work with teams. Learn how the volunteer team members work best and try to facilitate it wherever possible. This is especially important for volunteer roles. In most cases, you can try switching up unpleasant tasks, ensuring that the library is as comfortable as possible, and pairing employees up so that no one is alone.

Volunteers and employees in libraries often put a lot into helping. The library should take the time to thank everyone who pitches in. Taking a few minutes to thank people for their help while they are working. Hold formal recognition at events or to hold small events to thank volunteers can go a long way towards producing the goodwill that keeps volunteers onboard and at the library. Showing appreciation and recognition of a job well done reinforces the library as a good environment while making volunteers feel better about their time spent working.

Fundraising and Volunteers

As a result of the decline in public support and increasing costs, many institutions of higher education are seeking increased private funding. Turning to private money to supplement other sources of income is a reasonable strategy for higher education as state governments cannot be

relied upon to fund at the same levels they did in the past. Evidence indicates that there is private funding to be found. According to Summers (2006), "By several measures, well over $100-trillion will exchange hands in the next decades as baby-boomer wealth passes to the next generation" (p. 22). Thus, institutions of higher education in the United States of America are seeking supplementary new sources of revenue from private donors just as one of the largest transfer of wealth is about to occur between generations (Lorenzen, 2009).

Raising funds for a library is closely tied to marketing a library. Donors are unlikely to give to a library if they are unaware of it or if they do not think highly of it. Past experience strongly suggests that it is not enough for potential donors to simply “like” libraries. A general knowledge and appreciation of libraries often does not make libraries a high priority for donors. How can donors be made aware that a library is a worthwhile beneficiary of a gift? One way is by encouraging them to volunteer to help the library.

This is not a new idea for academic libraries. Academic libraries have long used volunteer boards as a form of donor cultivation that will get prospective or current donors to start or continue giving. Every participant in a 2009 study mentioned volunteer boards in some capacity during the interviews either relating to identifying donors or in cultivating donors. Lorenzen (2009) wrote, “Library boards of all kinds (friends, advisory, foundation, etc.) can be used to find new donors and keep current donors actively engaged with the library. As a study participant said, ‘Our strongest continual large donors are those that have been here and understand us and many of them have become board members.’ This appears to be a very successful practice in soliciting donations.” (p. 102).

Academic libraries have run into a major problem regarding fund raising. Quite simply, they have no built-in constituency. "No one graduated from the library; there is a perception that it is difficult to raise funds for a library" (Martin, 1998, p. 3). To help resolve this problem, Martin (2000) argued that libraries must be part of larger campus-wide development efforts. However, one problematic result of simply relying on a broader campus campus-wide effort is that libraries often are given lists of donors from central development offices on a campus of donors who have proven in the past to be unresponsive to fund raising appeals and unlikely to contribute (Ruggerio & Zimmerman, 2004). Such lists are not effective starting points for a library campaign. There is an easy solution to this problem. If a library can get potential donors involved in library volunteering, they become part of the libraries pool of potential donors.

As such, it is very important for academic libraries to treat volunteers as either near term or long-term potential donors. The experience the volunteers have in the library may result in cash or other tangible gifts in the future. It gives the library an opportunity a way to appeal to donors the library might not otherwise be able to reach.

Conclusions

Although not as common as in public libraries, academic libraries do sometimes make utilization of volunteers to help. Many academic libraries use volunteers for special projects, programming such as events, and some day to day operations. Volunteers means dealing with people and it comes with multiple obligations to the library including legal and ethical implications and impacts. This paper looked at the literature that deals with libraries and how they interact with volunteers including literature specific or directly applicable to academic libraries. It looked at legal implications relating to volunteer working conditions, screening, and equal opportunity. It reviewed reasons people volunteer, recruitment, and how to use that

in any academic library volunteer program. It also examined training and daily management of these volunteers and how to connect volunteer service to library development efforts in fundraising.

Having a successful academic library volunteer program will require a lot of work. It can be done and has been done successfully by many institutions. If a library commits to doing this well, the rewards make it worthwhile.

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Enhancing the Efficacy of Identifying Visual Patterns and Novel Anomalies of Cyber-Defenders With 3D Immersive VR

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The mission of a Cyber Security Officer (CSO) during a cyberattack is to identify anomalies in visual signals and to ascertain whether they are hostile. These signals occur in an environment overflowing with data, which is constantly shifting shape and density, and in which the rate of change keeps accelerating and novel anomalies arise. In this environment, previous experience is disadvantageous and oftentimes harms the ability of a CSO to identify novel patterns of anomalies. This study tested, in a moderated mediation model, the effect of Immersive Virtual Reality (IVR), while identifying hidden forms in Embedded Figure Tasks (EFTs), on the ability to detect a novel and unknown anomaly. Through a quasi-experiment with repeated measurements, we compared five research groups, four of which practiced cognitive intervention while detecting cyber anomalies. The improvement was tested through a pre-test and post-test procedure. A cluster sampling involved 120 students recruited from the Academy of Computer and Cyber Training at the Telecommunication Branch of the Israel Defense Forces. We found that participants who practiced the EFTs in an IVR information-diluted environment (VRLVL) detected novel anomalies faster than the control group. We also found that the higher the thought elasticity of the participants in an IVR highly-loaded environment (VRHVL), the higher their speed in detecting novel anomalies.

Keywords: 3D Immersive VR, Cyber, Cyber Security Officer, Cyberattack, Cyber Training, Anomalies, Visual Patterns, Embedded Figure Tasks

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Introduction

The information age is characterized by digitized environments overflowing with data that are constantly shifting shape and density, and in which the rate of change keeps accelerating. However, our ability to process all the information obtained from our senses is limited and affected by various factors, the most dominant of which is attention (Posner & Petersen, 1990). Previous studies have found solutions to increase attention and the amount of information processed in a state of data overload and have also suggested ways to improve the ability to detect visual changes in an information-laden environment. These studies have found that it is possible to increase the amount of information a person can process in four ways: (a) by reducing the irrelevant information that comes to him/her (Bavelier, et al., 2012); (b) by directing attention exclusively to relevant stimuli (Coren, Ward & Enns, 1991); (c) by grouping an unlimited number of items into a single unit of meaning known as an "information chunk"; (d) and by creating an analogy to prior knowledge that is stored in memory (Bar, 2007).

However, these studies did not address the identification of a new and unfamiliar visual stimulus, where experience cannot be applied to the nature of the new stimulus or where that experience impairs a person's ability to identify new patterns—be they algebraic, textual, numerical or geometrical signatures (Passig, 2007; Bilalić & Mcleod, 2014; Storm & Patel, 2014). These situations characterize the mission of a human defender against cyberattacks, whose job it is to monitor the system while being required to identify new attacks for which nothing from his/her past knowledge is relevant. In the language of cyberdefense, these are called "zero-day vulnerabilities." In these instances, the human cyber-defender is required to detect a change in visual signals or patterns, to generalize it, and to produce the insight that a cyberattack is indeed underway. In this respect, the ability to classify change, as normal or abnormal, shifts rapidly.

The term "anomaly" is used to describe any deviation from a particular norm or law in a variety of fields. This is an irregularity that is difficult to explain in existing rules and theories. Such an attack is associated with a new type of attack on online databases, for which the defense methods used so far do not provide the required response. Today's common defense systems protect against known attacks based on known signatures (hallmarks). This method of defense provides a satisfying ping that alerts in the case of certain and known attacks, but it is useless in the face of the increasingly unrecognized attacks, which lack a familiar signature. Solving this problem requires different solutions (Garcia-Teodoro, et al., 2009). One possible solution is to monitor the anomaly of network activity, both by computerized systems and by human monitors (Riveiro et al., 2008).

Over the years, studies have addressed the cognitive process required to identify visual change (Simons & Levin, 1997). These studies have found that the ability to detect change is related to the place of the change when it appears on the retina, but the studies did not address where and how one might identify a new and unfamiliar stimulus. It was later discovered that visual perception of an object found around a person's eyes is affected by generating an analogy with a similar object found in one's memory (Bar, 2007). This finding implies that, in any case, we need to have a similar representation of the object in our memory. To the best of our knowledge, this sums up a defender's unique challenge in identifying real-time cyberattacks. The visual representation of a future attack is not similar to its past representation or to the alert algorithms that are stored in automated monitoring systems.

From a review of the literature on the detection of anomalies in the cyber realm, we have not yet found a cognitive model for training cyber-defenders in anomaly detection.

We have found additional cognitive differences in the research literature that seem to affect the way a person learns, perceives, and processes visual information, which is relevant to our inquiry. For example, it seems there is a marked difference between people whose way of learning depends on the external environment (FD: Field Dependent) in the process of visual identification and processing compared to those who do not depend on external cues (FI: Field Independent) (Dillon & Gabbard, 1998). This cognitive style distinguishes people based on their ability to absorb and process visual information and based on their ability to solve complex problems. People who are not dependent on their external environment to learn are quicker at identifying a particular geometric shape hidden within a variety of shapes, compared to those who are dependent on their external environment who may not recognize it at all. Angeli & Valanides (2004), also found that people who depend on their external environment have difficulty finding relevant information within information-laden environments. The possible explanation that has been suggested is that their minds are probably distracted by the environment and as a result, they struggle to isolate the target object from its surrounding.

Field Independent (FI) people have also been found to be able to isolate relevant information from complex environments, process it accurately, analyze ideas for the components that construct them, and frame them into new configurations—all the more than Field Dependent (FD) people, who are more traditional in their way of thinking. However, the implications of the cognitive style of FD or FI in the context of identifying visual information and processing it in a computerized environment are not unequivocal and the conclusions drawn by various researchers in this regard are contradictory (Angeli & Valanides, 2004).

In this regard, Lavie, Beck, and Konstantinou (2014) found that during tasks with a low perceptual load, the awareness of new stimuli increases, while during tasks with a high perceptual load, it decreases. The researchers also found that in the task of natural contrast, when the level of perceptual load is low, such as at the stage where one differentiates between “mountain” and “tree,” the number of neutral stimuli for perception increases. Conversely, in an unnatural contrast, that requires perceptual effort, the number of neutral stimuli that reach perception decreases. On the other hand, in a state of high cognitive load in working memory, a person tends to relate to neutral stimuli that may distract him/her from the target stimulus (Lavie, Hirst, de Fockert & Viding, 2004) and the number of new stimuli that rise to perception increases, and vice versa (Storm & Patel, 2014).

In the literature review, we found also that high levels of mental flexibility and diversity in information representation, including 3D, contribute to the process of identifying anomalies in an information-laden environment (Riveiro et al., 2008). We also found that the ability to detect a variable visual stimulus is affected by the subject's level of tolerance for uncertainty and his/her degree of dependence on the external environment (FD/FI) (Witkin, 1981).

The literature review also indicates that representation through 3D Immersive Virtual Reality (IVR) enhances mental flexibility (Passig & Eden, 2000b). Researchers (Jacob, Averbuch, Sacher, et al., 2013), also found that practicing 3D IVR improves cognitive skills, with an emphasis on planning ability and mental flexibility. These skills are defined as high-order cognitive abilities that are required to perform new or complex daily tasks.

Thus, we engaged to develop a cognitive model for identifying an object/signal/signature that is not based on experience. The cognitive model we tested is based on tolerance for uncertainty, mental flexibility, and independence in the external environment in identifying and processing the anomalous stimulus, to find a solution to the challenge of detecting an anomaly in a rapidly changing environment.

Procedure

This study was conducted in a quasi-experimental mode. We examined the effect of the practice of identifying hidden geometrical signatures in different modes of representation (2D or 3D IVR) and different types of information loads (information-laden environment or information-diluted environment), on the level of accuracy and speed in anomaly detection, with the following variables: tolerance for uncertainty, cognitive closure, and mental flexibility. The improvement in anomaly detection was examined in pre-and post-tests. The participants were sampled in a cluster-sampling method from differentiators in the final stage of the IDF Cyberdefense course and trainees in the first two weeks of another similar cyberdefense course.
Accordingly, we examined in the study five research conditions with five different groups of trainees as detailed herein.

Study groups:

- VRLVL (N=22): This group practiced the task of identifying hidden shapes in an information-diluted environment in 3D immersive virtual reality.
- VRHVL (N=19): This group practiced the task of identifying hidden shapes in an information-laden environment in 3D immersive virtual reality.
- 2DLVL (N=25): This group practiced the task of identifying hidden shapes in an environment that dilutes information in a 2D mode of representation.
- 2DHVL (N=21): This group practiced the task of identifying hidden shapes in an information-laden environment in a 2D mode of representation.
- Ctrl (N=33): This group didn't practice identifying hidden shapes, they developed a scenario of identifying anomalies in a pretest and a posttest.

Table 1 shows the breakdown of the research groups per mode of representation and information load.

Research groups	Information Representation	Information load
VRLVL	3DVR	Low
VRHVL	3DVR	High
2DLVL	2D	Low
2DHVL	2D	High
Ctrl	-	-

Table 1: Research Conditions per Modes of Representation and Information Loads

Note. 3D virtual reality in an information-diluted environment (VRLVL); 3D virtual reality in an information-laden environment (VRHVL); 2D in an information-diluted environment (

2DLVL); 2D in an information-laden environment (2DHVL); Control Group (Ctrl); 3D Virtual Reality (3DVR); 2D (2D).

Participants

This study included 120 participants, 34 of whom were women (27.9%) and 86 of whom were men (72.1%). Their age ranged from 18 to 24 years (M=18.5, SD=0.61), The range of their schooling years was from 12 to 15 years (M=12.4, SD=0.57).

Table 2 presents the distribution of participants per background variable divided by the five study groups. A $\chi 2$ test was performed for categorical background variables and further analysis (One Way ANOVA) for continuous background variables.

Variable name	VRLVL (n=22)		VRHVL (n=19)		2DHVL (n=21)		2DLVL (n=25)		Ctrl (n=33)		Statistical comparison
Gender, N (%)											
Women	6	(27.3)	8	(42.1)	6	(28.6)	6	(24.0)	8	(24.2)	$\chi 2$ (4) =2.18, p = .703
Men	16	(72.7)	11	(57.9)	15	(71.4)	19	(76.0)	25	(75.8)	
Age, M (SD)	18.14	(0.46)	18.16	(0.60)	18.4	(0.67)	17.96	(0.53)	18.12	(0.69)	F (4,115)=1.38, p=.244 η_p^2=.046
Education, M (SD)	12.05	(0.21)	12.05	(0.23)	12.32	(0.90)	12.12	(0.60)	12.15	(0.61)	F (4,115)=.831, p=.508 η_p^2=.028

Table 2: Distribution of Participants per Background Variables Divided by Study Groups

Note. 3D virtual reality in an information-diluted environment (VRLVL); 3D virtual reality in an information-laden Environment (VRHVL); 2D in an information-laden environment (2DHVL); 2D in an information-diluted environment (2DLVL); Control Group (Ctrl); all p's> .05

Looking at test values, $\chi 2$ presented in Table 2 indicates there was no significant dependence between the background variables and the demographics. Also, in the variance analysis, no significant differences were found in continuous background variables per study groups. Hence, there was no need for statistical monitoring of the background variables to examine the research hypotheses.

The study took about a year to complete. After receiving the appropriate approvals from the military authorities, we administered the test battery to the participants during the computer courses' selection process at the computer school and during the first week of the cyberdefense course.

In the first phase, the participants completed personal background questionnaires and cognitive questionnaires (tolerance for uncertainty, cognitive closure, and mental flexibility). Data was also collected regarding the achievement tests that they received during the screening process by the military authorities.

In the second stage, the participants performed a computer anomaly detection task. The first ten times they had to find the letter B, and the 11th time they had to find the letter D. Figure 1 shows a scenario used in the anomaly detection task to identify the letter B.

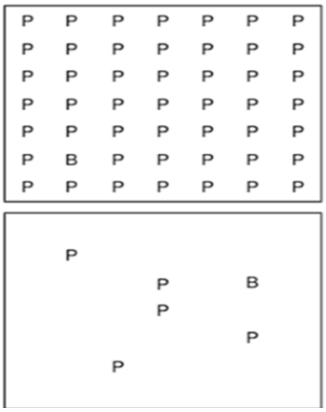

Figure 1: Scenario Used for Signal Detection Anomaly Task

In the third phase of the study, the four intervention groups practiced a hidden form task in the different representation modes. The intervention took about 20 minutes, and the participants were required to identify 20 hidden forms when their time and accuracy were automatically measured. The characteristics of the practice varied according to the study group. In the VRHVL group and the VRLVL group, the participants practiced the task of the hidden geometrical shapes in the computer while wearing the Oculus Rift virtual reality headset in an information-laden environment and an information-diluted climate. In contrast, the 2DHVL and 2DLVL groups practiced the test of the computer's hidden geometrical shapes without wearing a virtual reality headset in an information-laden environment and information-diluted climate.

In the fourth and final stage, the participants performed an anomaly detection task similar to the second stage of the procedure.

Data were obtained from the military authorities regarding the results of the five factors in BTS personality for cyber course trainees only. The ability to detect an anomaly (in real-time) in a cyber defense course was measured. This task remained confidential due to field security reasons, and the final grades were passed on to us using trainee assigned numbers.

Tests

Questionnaire for Thought Flexibility

In our study, we used a “circular” sub-test, based on a questionnaire for checking thought flexibility developed by Torrance (1966). We checked whether exercises that involved rotating 3D objects, which requires an ability to look at objects from different angles, would influence the participants’ thought flexibility. The test included both verbal and non-verbal tasks. In the non-verbal tasks, the flexibility sub-test (in its non-verbal form—the clause of repetitive stimuli) is presented to each subject on a piece of paper featuring thirty-six identical circles.

Fig. 2 presents a screenshot of a (non-verbal) flexibility sub-test—the clause of repetitive stimuli.

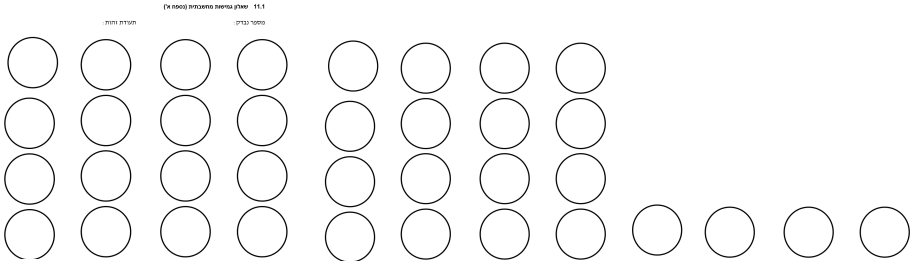

Figure 2: A (Non-Verbal) Flexibility Sub-Test

Tolerance for Uncertainty Questionnaire

In our study, we used a questionnaire for investigating the cognitive aspect known as "tolerance for uncertainty," (McDonald, 1970). The questionnaire includes 15 statements. Test participants are asked to give their opinion about the extent to which each statement is true or false. For example: "I have little interest in a problem that I don't think has a solution" (statement 1); the statements are ranked on a scale from 1 ("completely disagree") to 5 ("agree very strongly").

Cognitive Closures Questionnaire

Another questionnaire that we used in our study was intended to examine the cognitive aspect known as "closure." The questionnaire includes 16 statements. The subject must give his opinion about the extent to which these statements are true or false. For example: "I feel uncomfortable in unpredictable situations" (statement 1); "a regular life with fixed hours suits my temperament" (statement 2).

Embedded Figure Test

We examined a perceptual test for processing shapes. This test was computerized and involved 20 multiple-choice questions. The test lasted 12 minutes. The range of (raw) scores was 0-20. Participants had to identify a single shape out of five simple shapes, embedded inside a more complicated shape. The quicker each subject managed to locate the simple shape, the more his cognitive style tended to a lack of dependence on the complexity of the field. This test included questions of increasing difficulty. The exercise is based on four formulae that parallel the test of the hidden shapes drawn for this study, per different research conditions. Each group ran the exercise for around 20 minutes. The exercise was conducted using VR headsets. A small percentage of participants felt slightly dizzy for a brief period during the test. Their performance in the test was evaluated based on the total time required for each subject to identify the 20 scenarios. The longer it took, the weaker their performance. This test served our study as a research intervention to improve the detection of anomalies.

Figure 3 presents an example of a multiple-choice question in the hidden shapes test, featuring a graphical shape of a low level of difficulty.

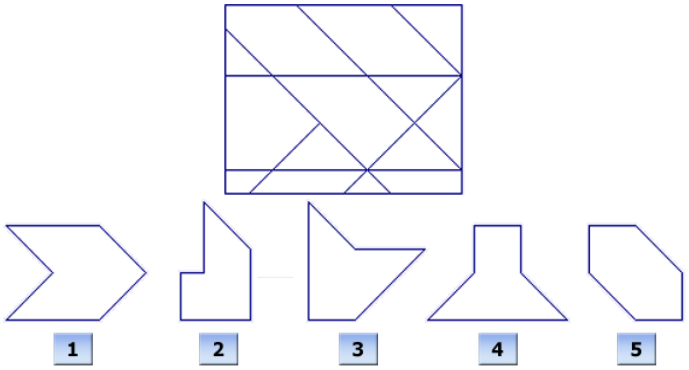

Figure: 3 A Multiple-Choice Question in the Hidden Shapes Test

A B

Figure 4: Sample of Screenshots of Practicing Hidden Shapes by Learning Environment: A. An Information-Laden Environment B. Information-Diluted Environment

Figure 5 shows an image of an Oculus Rift Virtual Reality (VR) headset we used in this study.

Figure 5: An Oculus Rift Virtual Reality (VR) Headset

Results

The findings indicate that at both measurement times, most participants detected anomalies; no clear difference in anomaly detection was found based on how the information was presented. As for the speed of the detection, in the post-intervention stage, regression analysis shows that consistently with the hypothesis, among participants in the 3D simulated reality group and the 2D simulated reality group, the time it took to complete the task was significantly shorter compared to the control group. Nevertheless, both of these research groups reached similar results, contrary to the hypothesis. As such, we noted that the addition to the explanation for the difference of these conditions obtained a marginal level of

significance. Finally, we noted that no significant moderation effect was found for the tolerance for uncertainty, cognitive closure, and thought flexibility variables concerning the contribution of the presentation to the predicted speed of anomaly detection. Nevertheless, it was found that the greater the level of thought flexibility, the longer the time it took to complete the task (marginal significance).

Predictors	Model A		Model B		Model C	
	$R^2\Delta$	β	$R^2\Delta$	β	$R^2\Delta$	β
Step I	.03		.03		.03	
Gender		.12		.12		.12
Age		-.10		-.10		-.11
Education		.05		.05		.01
Cognitive exams		-.12		-.12		-.11
Step I I	.06#		.06#		.06#	
Gender		.11		.11		.11
Age		-.11		-.11		-.12
Education		.04		.04		.01
Total score in cognitive exams		-.12		-.12		-.12
VR		-.28*		-.28*		-.29*
2D		-.27*		-.27*		-.28*
Step III	.00		.00		.03	
Gender		.12		.11		.13
Age		-.10		-.12		-.14
Education		.03		.04		.00
Total score in cognitive exams		-.14		.-12		-.12
VR		-.29*		-.28*		-.27*
2D		-.28*		-.28*		-.26*
Tolerance for uncertainty		-.06				
Cognitive closure				.03		
Flexible thinking						.16#
Step IV	.02		.00		.05	
Gender		.13		.11		.11
Age		-.10		-.12		-.14
Education		.03		.04		.02
Total score in cognitive exams		-.14		-.12		-.16
VR		-.30*		-.28*		-.28*
2D		-.27*		-.27*		-.26*
Tolerance for uncertainty		-.20				
Cognitive closure				.08		
Flexible thinking						.09
VR x Tolerance for uncertainty		.07		---		
2D x Tolerance for uncertainty		.20		---		
VR x Cognitive closure				-.08		
2D x Cognitive closure				.20		
VR x Flexible thinking						.21

2D x Flexible thinking			-.09
R^2	.11	.09	.16

Table 4: The Effect of Representation of Information on Speed of Identifying Anomaly —Hierarchical Regression

Note. Gender: 0=women; 1=men. Methods of information presentation: 3D virtual reality (VR); two-dimensional image (2D); Model A: Moderation effect of the tolerance for uncertainty metric (N=95); Model B: Moderation effect for cognitive closure metric (N=95); Model C: Moderation effect of flexible thinking metric (N=97). $p < .05$ * $p \leq .06$#.

As for the second research hypothesis, the pattern of results partially confirms it. The findings show that at both measurement times, most participants identified an anomaly, and no significant difference in anomaly detection was found based on the information load. As for the speed of the anomaly detection, in the post-intervention stage, regression analysis shows that consistently with the hypothesis, among participants in information-laden environments and information-diluted environments, the time it took to complete the task was significantly shorter compared to the control group. Nevertheless, these two research conditions made similar predictive contributions, contrary to the hypothesis. As such, note that the addition to the explanation of the differences between these conditions achieved significance. Finally, we note that no significant moderation effect was found in the case of the tolerance for uncertainty, cognitive closure, and thought flexibility variables concerning the contribution of information loads to predicting the speed of anomaly detection. Nevertheless, we found that the higher the level of thought flexibility, it took significantly longer to complete the task.

Predictors	Model A		Model B		Model C	
	$R^2\Delta$	β	$R^2\Delta$	β	$R^2\Delta$	β
Step I	.03		.03		.03	
Gender		.12		.12		.12
Age		-.10		-.10		-.11
Education		.05		.05		.01
Cognitive exams		-.12		-.12		-.11
Step I I		.06*		.06*		.07*
Gender		.12		.12		.12
Age		-12		-.12		-.13
Education		.03		.03		.00
Total score in cognitive exams		-.12		-.12		-.11
Empty		-.32*		-.32*		-.32*
Load		-.23*		-.23*		-.23*
Step III		.00		.00		.03#
Gender		.12		.12		.14
Age		-.11		-.13		-.15
Education		.03		.03		-.01
Total score in cognitive exams		-.13		-.11		-.11
Empty		-.32*		-.32*		-.31*
Load		-.23*		-.22*		-.21
Tolerance for uncertainty		-.05				
Cognitive closure				.05		
Flexible thinking						.17*

Step IV	.00		.02		.00	
Gender		.12		.12		.12
Age		-.10		-.14		-.14
Education		.03		.03		-.00
Total score in cognitive exams		-.12		-.08		-.11
Empty		-.33*		-.32*		-.32*
Load		-.24*		-.21#		-.22#
Tolerance for uncertainty		-.20				
Cognitive closure				.10		
Flexible thinking						.09
Empty x Tolerance for uncertainty		.13				
Load x Tolerance for uncertainty		.12				
Empty x Cognitive closure				-.13		
Load x Cognitive closure				.06		
Empty x Flexible thinking						.12
Load x Flexible thinking						.00
R^2		.11		.11		.12

Table 5: The Effect of the Environment on the Speed of Identifying Anomaly –Hierarchical Regression

Note. Gender: 0=women; 1=men. Information load: information-diluted environment (empty); information-laden environment (load); Model A: Moderation effect of the tolerance for uncertainty metric (N=95); Model B: Moderation effect for cognitive closure metric (N=95); Model C: Moderation effect of flexible thinking metric (N=97). $p < .05$ * $p \leq .06$#.

Finally, the pattern of results points to partial corroboration of the third research hypothesis. Regarding the detection of anomalies, no confirmation was obtained for the hypothesis, because the results point to most participants detecting anomalies at both measurement times, and no significant difference was found in anomaly detection based on the manner of the presentation of the information and the information load. As for the speed of anomaly detection, in the post-intervention stage, regression analysis shows that consistently with the hypothesis, among the participants in the 3D reality in the information-diluted environment, it took significantly less time to complete the task compared to the control group. Nevertheless, the contribution to the prediction of the 3D simulated reality in the information-diluted environment was not significantly different from the predictive contribution of other research conditions. Finally, we note that no significant moderation effect was found for the tolerance for uncertainty, cognitive closure, and thought flexibility variables concerning the contribution of the manner of the presentation of the information and the information load to predicting the speed of anomaly detection. Accordingly, the hierarchical regression analysis predicted significant effects that were not obtained using the PROCESS software.

Predictors	Model A		Model B		Model C	
	$R^2\Delta$	β	$R^2\Delta$	β	$R^2\Delta$	β
Step I	.03		.03		.03	
Gender		.12		.12		.12

Age		-.10		-.10		-.11
Education		.05		.04		.01
Cognitive exams		-.12		-.12		-.11
Step II	.01		.06		.07	
Gender		.12		.12		.12
Age		-.12		-.12		-.13
Education		.03		.03		.00
Total score in cognitive exams		-.12		-.12		-.11
VRHVL		-.17		-.17		-.17
VRLVL		-.28*		-.28*		-.28*
2DLVL		-.24*		-.24*		-.25*
2DHVL		-.20		-.20		-.20
Step III	.00		.00		.03	
Gender		.12		.12		.14
Age		-.13		-.10		-.14
Education		.03		.03		-.00
Total score in cognitive exams		-.11		-.13		-.11
VRHVL		-.16		-.17		-.14
VRLVL		-.29*		-.28*		-.28*
2DLVL		-.24*		-.25*		-.28*
2DHVL		-.20		-.20		-.20
Tolerance for uncertainty		.05				
Cognitive closure				-.05		
Flexible thinking						.17
Step IV	-.00		.04		.06	
Gender		.11		.09		.12
Age		-.16		-.11		-.15
Education		.03		.03		.01
Total score in cognitive exams		-.07		-.10		-.16
VRHVL		-.10		-.17		-.13
VRLVL		-.27*		-.28*		*31.
2DLVL		-.25*		-.21		-.24*
2DHVL		-.20		-.21		-.19
Tolerance for uncertainty		.11				
Cognitive closure				-.19		
Flexible thinking						.09
VRHLV x Tolerance for uncertainty		.10				
VRLVL x Tolerance for uncertainty		-.02				
2DLVL x Tolerance for uncertainty		.01				
2DHVL x Tolerance for uncertainty		-.17				
VRHLV x Cognitive closure				.14		
VRLVL x Cognitive				.02		

closure			
2DLVL x Cognitive closure		.00	
2DHVL x Cognitive closure		.22	
VRHLV x Flexible thinking			.11
VRLVL x Flexible thinking			-.08
2DLVL x Flexible thinking			.22
2DHVL x Flexible thinking			-.06
R^2	.13	.14	.18

Table 6: The Effect of the Representation of Information and the Environment on the Speed of Identifying Anomalies -- Hierarchical Regression

Note. Gender: 0=women; 1=men. Virtual reality in an information-laden environment (VRHVL); virtual reality in an information-diluted environment (VRLVL); 2D in an information-diluted environment (2DLVL); 2D in an information-laden environment (2DHVL). Model A: Moderation effect of the tolerance for uncertainty metric (N=95); Model B: Moderation effect for cognitive closure metric (N=95); Model C: Moderation effect of flexible thinking metric (N=97). $p < .05$

Discussion

In the first research hypothesis, we assumed that participants who performed the hidden shapes task in the 3D simulated reality group and the participants who performed this task in the 2D group would improve the precision and speed of their anomaly detection more than the participants in the control group, which did not perform these exercises. Additionally, participants who practiced the hidden shapes task in the 3D simulated reality group would improve the precision and speed of their anomaly detection more than participants who performed this exercise in the 2D group.

This hypothesis was partially corroborated, and it was found that participants who practiced the hidden shapes task in the 3D and 2D simulated realities demonstrated a greater improvement in the precision and speed of their anomaly detection than the participants in the control group.

Various explanations for this result can be found in the research literature. Rizzo and Schultheis (2001) argued that the environment of a 3D simulated reality makes participants forget that they are in a test, and thus reduces their sense of pressure and anxiety and improves their performance in comparison to the control group. They also found that in an immersive 3D environment, there is a comparative advantage in the performance of cognitive evaluation and diagnosis processes compared to traditional environments. The advantage is a product of elements of an environment free of environmental risks, and of elements of the ability to control examinable stimuli. According to them, experience in the simulated reality makes participants “forget” that they are in a test and makes it possible to check them less artificially than traditional test conditions. As such, the exercise in the 3D simulated reality creates a sense of “selective experience” based on the individual’s tendency to focus on specific, significant, and interesting information.

As for the selective experience, the experience of being present in a simulated reality exists when there is the ability to focus on a set of significant, interconnected, fluent, and coherent stimuli that neutralize the irrelevant stimuli in one’s physical surroundings, which blend into

the other characteristics of the simulated reality to create a comprehensive whole. The findings from our first hypothesis correspond with the findings of these and other studies, which have pointed to the fact that the simulated reality helps with several diverse cognitive functions (Passig and Eden, 2000; Brooks and Rizzo, 2005), such as visual perception of space (Tong, Marlin, Barrie, and Frost, 1995), and the raising of Cyber Situational Awareness (Kbil et al., 2018).

Brooks and Rizzo (2005) also note that in simulated reality, it is possible to broaden a person's perspective of a concept/task by using another visual perspective that was not possible in reality. These perspectives are called "frames of reference" (FOR). Participants may maintain these abilities after the hidden images exercise, carrying them through to the visual anomaly detection task, enabling them to identify anomalies more quickly than test groups, with the goal changing from B to D.

On the other hand, we found no confirmation for the 3D and 2D simulated realities contributing to boosting the rapid detection of anomalies, contrary to the first research hypothesis. One possible explanation for this might derive from the dispute in the research literature about the implications of FD or FI cognitive styles in the context of identifying visual information and processing it in computerized environments (Angeli and Valanides, 2004), and the fact that in our study, the cognitive exercise was one-off and non-continuous, and as a result, it is possible that the transference effect to the true situation was deficient. Another possible explanation for this might derive from prior gaming experience. Participants with prior gaming experience adjusted quickly to the Oculus Touch motion controllers, suggesting that the relevant dexterity and muscle memory for gaming console controller usage helps users adjusting from those controllers to handling input devices for VR experiences. Multiple participants acknowledged that such 3D visualizations of network topology could assist in their understanding of the networks they use daily (Kullman, Ryan & Trossbach, 2019).

We found supporting evidence for this finding in the literature, which indicated that passing from the anomaly detection test to the true situation among cyber-defenders improves the more challenging and longer the exercise is (Dutt et al., 2012).

Consistent with the second research hypothesis, the results also seem to indicate that among participants in the information-laden environment and the information-diluted environment, the time it took to detect anomalies was significantly shorter in comparison to the test group. This can be explained with reference to the term "hidden steering process." This process refers to the performance of the hidden shapes test with variable loads of information by the test group, not the control group. The research literature reports that the absence of steering for work processes creates another cognitive load, which finds expression in an extension of the participants' response time and a decline in their degree of accuracy, especially in questions with low levels of cognitive load (Waxman, 2016). Indeed, in our study, the visual anomaly detection was during activities with low cognitive loads, and therefore it is possible that the lack of steering in the control group alone created another cognitive load, beyond the existing visual load.

According to the research literature, cognitive load affects people's ability to perform tasks as a result of the connection between them and their working memory. Cognitive load is created by several factors, such as the visual load (Huanga et al., 2014); the type of question—local or global (Kima et al. 2014); and participants' prior knowledge about the processing of visual

information (Gaissmaeier et al., 2011). These create a scale of seven levels of cognitive load. In the research literature, we find that an increase in cognitive load, demanding a greater volume of working memory, will lead to a longer response time. It is possible that in our study, participants who were required to perform the anomaly detection task without prior exercises that might have distracted them from the core exercise experienced greater cognitive load than the test group, and therefore the response time for anomaly detection was longer compared to other research groups that experienced cognitive interventions with variable levels of information. Additionally, the results of our research point to a comparative advantage to the exercise in information-diluted environments compared to the test group, consistent with the findings of Riveiro (2001), who recommends reducing the cognitive visual load to the minimum necessary to perform a visual detection task.

In contrast to these findings, we found that the two research conditions—the information-laden and information-diluted environments—made similar predictive contributions, contrary to the second research hypothesis. This result may derive from the motivational aspect of the anomaly detection task. In the research literature, we find that in tasks with high levels of motivation, the noise effect ("information load" in our study), which is independent of the target stimulus, does not influence the degree of attention to the stimulus (Kjellberg, 2004). The participants in our study were students in the IDF's computing and cyber courses and therefore may have had high motivation to succeed in the course and their roles. It is also possible that they were highly motivated to succeed in this task. Veneruso et al., (2020), also showed that CyberVR is equally effective but more engaging as a learning method.

As for the third research hypothesis, in analyzing variance, we did not find a significant difference in all the metrics of cognitive style according to the research conditions before the intervention, in contrast to the study of Dutt et al. (2013), who found that the greater a human cyber defender's tolerance for uncertainty, the more his/her ability to detect anomalies improves. The lack of significance may be a product of the homogeneity of the participants in our study. As such, the predictive contribution of the 3D simulated reality in the information-diluted environment was not significantly different from that of the other research conditions. This finding is consistent with the dispute in the research literature around the question: do background noises positively or negatively affect hidden shape tests? The cognitive exercise in the study of Andrew et al. (2013) found that the contribution of background noises to the performance of the hidden shapes test depends on the specific task and therefore it is not possible to determine unequivocally that background noises impede or contribute to the hidden shapes task.

Additionally, we have shown that in cyber defense, teamwork is better than the protection provided by an individual defender, and therefore it is advisable to check how the cognitive exercise influences anomaly detection in cyberspace by cyber-defender teams (Reed et al., 2013).

Conclusion

This study aimed at testing a novel way to overcome the most difficult issue in cyber defenders training. Cyber-attacks have become a critical threat to the digital human civilization. Attackers are constantly developing new tactics to penetrate the backbone of crucial human digital services with novel anomalies that are becoming harder and harder to detect before they cause damage. This study has demonstrated that defense tactics need to

evolve as well to better serve human civilization against a threat that brings havoc to social order.

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Ethical compliance statements: This study has been approved by the IDF and the School of Ed at Bar Ilan U. ethics committee for research involving humans.

Course Redesign Collaboration and Scaffolding

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The IAFOR International Conference on Education in Hawaii 2022
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Abstract
Designing courses that engage online learners to achieve the highest level of mastery of course learning outcomes is at the forefront of online course development at The University of Arizona Global Campus. In Spring 2021, full-time faculty in the Department of Education and Liberal Arts had the opportunity to redesign one of their core courses, ECD315: Curriculum Planning and Design for Early Learners. Throughout this paper, we will explore this process and highlight specific examples of how scaffolding and collaboration allowed for redeveloping a course that would increase student mastery of learning outcomes. Similarly, the co-construction of content by fulltime and adjunct instructors alike sought to deepen the partnership between these groups while increasing the self-efficacy and sense of connection to the university for the participating adjunct instructors.

Keywords: Online Learning, Scaffolding, Student Engagement

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Introduction

At the University of Arizona Global Campus (UAGC), faculty strive to include best-practice and increases student mastery of course learning objectives. In Spring of 2021, full-time faculty in the Department of Education and Liberal Arts (DEL) had the opportunity to redesign ECD315: Curriculum Planning and Design for Early Learners. This high-enrollment class has approximately 850 students each year.

Throughout the redesign, the developers sought to present material in multiple formats, including lecture, interactives, videos, and discussions. Scaffolding began in the first week of the course, leading up to the final summative project in the final week. The scaffolding allows for students to master smaller portions of the context while receiving instructor feedback. These concepts are then built upon for higher-level learning.

Adjunct faculty are an important part of UAGC, and the course designers asked for their input in the redesign. Adjunct faculty reported that while lesson planning is an important element of the current course, students have difficulty effectively creating those lesson plans. With this in mind, the course designers created a scaffolded approach to teaching lesson plans. Students work on one section at a time, rather than completing an entire lesson plan before receiving feedback. Each assignment builds on itself with the final project being a thematic unit with three full lessons. Additionally, learning material was altered to include videos, interactives, and multimodal means of representation.

Research Questions

This ongoing research project aims to find how the scaffolded course design using different modalities of learning contributes to student success and faculty satisfaction. Specifically, the research addresses the following:

1. How does presenting information through different modalities in an online asynchronous classroom impact student retention?
2. How does intentional scaffolding of content impact performance on course learning outcomes?
3. How do course tools that provide guided practice, reteaching, and scaffolding impact faculty's satisfaction when teaching?
4. How does intentional scaffolding of content impact faculty’s ability to support student success?
5. How do students perceive their own learning was impacted from the intentional scaffolding of the course content?
6. How do students perceive the presentation of content in this course in relation to presentation of content in their other courses?

Methods

The faculty survey will be distributed to those who taught the course both before and after the redesign. The student survey will be sent to all students who took the class between July 6, 2021 and January 31, 2022. No identifiable data will be asked of any participant and there are no foreseeable at-risk populations. Data will be collected and analyzed using Qualtrics. IRB approval was received before the study began. Additionally, the proposal was submitted to the Office of Research and Creative Scholarship (ORCS) for its approval to use institutional data. Informed consent was received by all students and faculty who completed the survey.

Results

This study is still in the data collection phase. Preliminary results show favorable responses from both faculty and students. Faculty reports that the scaffolded nature of the course, where assignments build on each other, allows them to provide more support to the students through providing feedback each week on smaller portions of a lesson plan. One faculty states, "Students who were not familiar with lesson planning were able to check comprehension along the way, instead of creating an entire lesson plan incorrectly." There is a faculty preference for the new design with its multimodal scaffolding.

Preliminary student data demonstrates a high preference for learning from a course that offers material in different ways (such as reading, videos, interactives, etc.) over a course that relies solely on reading. When asked which elements of the newly designed ECD315 best supported their understanding of the content, the top three answers were instructor feedback, interactives/learning activities, and the way the assignments built on each other. Students were asked, "In what ways did the larger Thematic Unit Assignment being completed over multiple weeks in the course support your student success?" The responses were positive, and students appreciated being able to space out the work throughout the course and fix errors based on instructor feedback. One student noted, "It helped me to design a more detailed and thorough lesson plan for my students which I use in the classrooms for training." Overall, the vast majority of students believed that the scaffolding had a positive impact on their learning in the course. They report understanding the course material well.

Summary and Conclusions

Although data is still being collected, both faculty and students are responding in a positive manner. We will continue to collect data until saturation is reached. In light of our preliminary findings, we believe that more UAGC courses should include scaffolded learning and multimodal means of content presentation.

Student and Faculty Experience With a Redesigned Discussion Forum

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Abstract
In the online classroom at the University of Arizona Global Campus, one of the primary means of student engagement is through course discussion forums. These typically require students to post in two discussions per week with one initial post and two peer responses. In a recent redesign of ECE315: Language Development in Young Children, a modified discussion structure was implemented to allow for more in-depth learning and engagement throughout the week. Our research questions include (1) In what ways has the discussion redesign impacted student performance? (2) What are student perceptions regarding the new discussion approach compared to the traditional discussion approach? (3) What are faculty perceptions regarding the new discussion approach compared to the traditional discussion approach? (4) To what extent do faculty and students prefer the new discussion approach compared to the traditional discussion approach? Both faculty and students responded in a positive manner. Seven out of ten faculty believe that the redesign helped students better engage with the weekly and course learning outcomes and said it helped with the grading workload. Overall, the faculty preferred the redesign (70%), saying that they appreciate in-depth learning on one topic. Seventy-five percent of students felt that they were able to engage more deeply with the weekly discussion topics, and nearly 80% reported a deeper connection with the course content. Overall, 72% of students preferred the new discussion approach, and 81% of students would like to see it used in more courses.

Keywords: Online Learning, Discussion Forum, Student Engagement

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Introduction

At the University of Arizona Global Campus (UAGC), online students complete discussion forums to take the place of face-to-face interaction. Many courses have two discussion activities per week, each requiring an initial post and two peer responses. With a redevelopment of ECE315: Language Development in Young Children, a revised discussion was implemented. The newly formatted class moved one weekly discussion to an interactive learning activity, so that no learning content was lost, and modified the remaining discussion to one in which the student creates an initial post early in the learning week, responds to three peers throughout the week, and creates a final post at the end of the week, summarizing overall learning and responding to instructor or peer questions and feedback.

Literature Review

The number of online courses is increasing as online learning becomes more appealing (Christensen, et al., 2011). Online courses can be just as effective as on-campus courses when the online format promotes effective peer and instructor interaction (Dixon, 2010). Course developers must find ways to craft effective discussions that promote critical thinking and active learning (Baker et al., 2005; Hew & Cheung, 2012). Students express satisfaction in discussions when they can share their points of view, learn from classmates, and ask questions of their own (Buelow et al., 2018). Students state that it can be easier to share in an online format than a face-to-face setting.

However, when there are several assignments or discussions due in a condensed time period, student satisfaction declines. Too many discussions are seen as busywork, but too few discussions leave the students feeling disconnected (Buelow et al., 2018). Students that drop out of their program state that low-level assignments and lack of interaction are two factors that contribute to program withdrawal (Willging and Johnson, 2009).

Well-crafted discussion questions take into account the student population of the college and allow for an engaging dialogue between peers (Fear & Erikson-Brown, 2014). While discussion interaction is elevated when instructors are active, peer-to-peer interaction is the most effective dialogue, as it builds classroom community (de Leon et al., 2010).

Research Questions

The researchers and faculty designers of the course aimed to see if the newly designed structure allowed for deeper conversation, taking away the rote aspect of typical discussion forums. ECE315 offers approximately 50 sessions per year, with 1,009 students taking the course from June 1, 2019, through May 31, 2020, which provided a rich participant pool for the study. Additionally, instructors of previous courses expressed frustration at not being able to effectively facilitate 10 discussions throughout the 5-week course, especially when enrollment numbers were high. This study aimed to discover if the redesigned discussion led to more student mastery of course learning outcomes and increased faculty satisfaction when compared to the previous course design.

Research Questions

1. In what ways has the discussion redesign impacted student performance?
2. What are faculty perceptions regarding the new discussion approach compared to the traditional discussion approach?
3. To what extent do faculty prefer the new discussion approach compared to the traditional discussion approach?
4. What are student perceptions regarding the new discussion approach compared to the traditional discussion approach?
5. To what extent do students prefer the new discussion approach compared to the traditional discussion approach?

Methods

Research Question One was answered using correlations between student performance on the previous discussions as compared to the newly formatted discussions, using non-identifiable data in the course learning management system. The remaining research questions were answered through survey links sent to students and teachers who had interacted with the course since the redesign. All data collected was analyzed through PowerBI and Qualtrics. IRB approval was received before the study began. Additionally, the proposal was submitted to the Office of Research and Creative Scholarship (ORCS) for its approval to use institutional data. Informed consent was received by all students and faculty who completed the survey.

Faculty Results

Ten out of fifteen faculty members completed and returned the survey. The survey results significantly supported the future implementation of this curriculum design model for discussion with seven participants (70%) stating that they would favor or strongly favor seeing this model implemented in more courses at UAGC. Seventy-percent felt there was a positive impact on the students and that the curriculum design format with one discussion post per week with three peer responses and a final summary post provided the students with the greatest opportunity to achieve the desired weekly and course learning outcomes. The majority of the faculty (80%) saw students engage in deeper discussion with the newly designed forum. Overall, 70% of surveyed faculty preferred the new format of one discussion per week with three peer responses and a final summary post. They stated that this approach allowed for more in-depth conversation on one topic, faculty enjoyed interacting with one in-depth learning topic each week, and grading one discussion post takes less time than the traditional two posts per week.

Student Results

Regarding research question one, *in what ways has the discussion redesign impacted student performance*, no significant differences were found. While there was an overall course grade increase (2.31%), it was not statistically significant.

Of the 203 student survey invitations, 102 responses were returned, for a completion rate of 50%. The results showed that 71.57% of students indicated a preference for the newly designed format. The biggest reasons that students prefer this model over the traditional are that it allowed for more in-depth conversations on one topic (34.33%) and that they preferred

to respond to three peers in one discussion rather than two peers in two separate discussions (32.09%). Over one quarter (26.87%) indicated the final summary post furthered their learning. One student stated, "I wish all the classes were set up like this. I finally was learning and had time to learn the material instead of just getting it over with." Another claimed, "the single discussion allowed me time to focus on the topic and really focus on my learning." Out of the 37 students who believed the traditional format of discussion to be more desirable, the main reason given was they disliked completing a final post (45.95%), followed by preferring to discuss two topics briefly over one more in-depth (21.62%), and they disliked completing three peer responses in one discussion (21.62%).

Seventy-five percent of respondents this course design helped them with discussion forum engagement and allowed them to engage more deeply with the course content. Most respondents (81%) of this survey indicated they would like to see this model introduced more frequently in other courses at UAGC. One respondent wrote, "Please change all the courses to this format, as soon as possible. I learned the material and we had more in-depth engagement." Another student stated, "I feel like it helped me to continue to think about my learning, hold on to the information I gained throughout the week and definitely was more engaging with peers."

Summary and Conclusions

Both faculty and students responded in a positive manner. Seven out of ten faculty believe that the redesign helped students better engage with the weekly and course learning outcomes. While faculty were split on whether the redesign helped with facilitation workload, which could be in part due to the extra reminders students require, 70% said it helped with the grading workload. Overall, the faculty preferred the redesign (70%), saying that they appreciate in-depth learning on one topic.

Seventy-five percent of students felt that they were able to engage more deeply with the weekly discussion topics, and nearly 80% reported a deeper connection with the course content. Overall, 72% of students preferred the new discussion approach, and 81% of students would like to see it used in more courses.

Due to the fact that both faculty and students prefer the redesign, and the survey results supported a positive impact on student learning and outcome attainment, we believe (1) the university should consider making similar changes to discussions in other courses, (2) faculty conversations and development should occur to help explain the value of changes to discussions, and (3) pre-written reminders for students could be provided to faculty to lower the extra work perceived. Future research can repeat the study with other courses and determine what other student-oriented changes might be appropriate in making more engaging classes.

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International Students' Acceptance of Online Learning During Pandemic: Some Exploratory Findings

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The COVID-19 outbreak in 2020 has impacted campus life in many ways, including shifting to online mode of teaching and learning, restricting face-to-face communication and activities, and forming of new norms of education. This paper investigates impacts of the pandemic to the way international students taking class and doing research, the satisfaction level, and obstacles of international students in Japan to online learning, as well as the factors which may influence the students' acceptance of online learning, A questionnaire containing both Likert-style and open-ended questions were sent to all international students at a university in Japan. Almost half of the non-research international students reported that their taking class was impacted, while almost 30% of graduate international students reported that their doing research was impacted during the pandemic. Japanese proficiency, years of enrollment and family status are found to be associated with impact on taking class. Access to supportive information from university is found associated with satisfaction level of online learning. These findings imply further investigation may need to be conducted for more evidence on whether that acceptance of online learning could be associated with certain factors, and if online learning could be a new norm of education.

Keywords: International Student, Japan, Online Class, Pandemic, Satisfaction

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Introduction

University students, especially international students must face many challenges during their campus life (Sherry et al., 2010). Since 2020, education sector witnesses to the ways that COVID-19 pandemic, with all of its impacts on classrooms and campuses (Dept. of Education USA, 2021). Since the beginning of 2020, university students in Japan are exposed to the impacts of Covid-19 pandemic (Tanno, 2020). So far, institutions and organizations in Japan have designed (Kondo, 2020) and implemented numerous schemes for supporting international students in Japan to cope with COVID-19, including providing daily life support, consultation, information (Nishiura, 2021). Some universities started to introduce new platforms for involving international students during the social distance period, such as photo contest (Tran, 2021), online exchange activities, stress prevention seminar for international students etc. Nevertheless, digital transformation at higher education and the future of online campus has been a long time topic for discussion (Haggans, 2016). The pandemic seems to be a strong trigger to push up this digital transformation process (Garcia-Penalvo & Corell, 2020).

In Japan until early 2021, university students already have experienced three epidemic waves of Covid-19 (Arima et al., 2021; Karako et al., 2021). During the first wave, certain anti-epidemic measures were introduced in campus, part of the classes have been canceled or shifted to online mode in short notice, academic staff and students have been not getting used to online class applications, as well as in campus internet access places has not been widely adjusted to meet the social distancing requirements. During the 2nd wave during the summer 2020, the campus life has seemed to adjust well to the online learning mode, and most of the students have been getting used to the online class. During the 3rd wave in the winter 2020, the burden of the pandemic has become heavier in Japan generally, but the situation has not changed too much in our target locality (Arima et al., 2021; Karako et al., 2021). Online class has become a new normal standard of campus life, as students have gained more and more adaptability with it. However, international students may develop anxiety (Takahisa, 2020), loneliness and stress (Katsuma, 2020) during the period of pandemic with online classes.

Tokushima University (TU) is a national university located at Shikoku Island in Japan. International students come from more than 20 countries consist of about 3% of the total of over 8.000 students enrolled. Like other universities in Japan, TU has had to face the same challenges during the pandemic such as online class, digital transformation, social distancing and isolation. Besides the impacts on the students at the campus, the pandemic interrupted the inbound and outbound flow of students, which admission of new international students impossible. Data from a survey conducted in November 2020 had shown some impacts of the pandemic on international students, including anxiety and low mental state (Tokushima University, 2021). However, it seems that international students have been well adapted to taking online classes over the time. The following two main research questions are addressed:
(1) What is the international students' satisfaction rate with online learning experience supported by their university? What are the reasons they feel this way and how can they be best supported?
(2) What, if any, are the associations between the international students' backgrounds and their satisfaction? Do they have any special needs?

This presentation aims to show: (1) impacts of the pandemic to the way international students taking class and doing research; (2) the satisfaction level and obstacles of international students towards online class; and (3) factors which may influence the students' acceptance of online learning.

Method

A cross-sectional survey was designed using online questionnaire using Google forms. The questionnaire included 4 level Likert-like questions for quantitative analysis, and open-ended questions for qualitative analysis. Participants were recruited during March 2021 by direct announcement. All international students at TU, including undergraduate, graduate, research students, exchange students were eligible to participate in the survey. Participants could choose to ignore or join the survey by clicking on the link provided and agreeing on the informed consent. This survey was fully anonymous, as no data to identify the person were recorded. We made analysis quantitatively and qualitatively of the data obtained. Quantitative data were analyzed by SPSS Statistics version 27.0 for Windows (IBM Corp., Armonk, NY, USA). Qualitative data was analyzed by content analysis).

Results

Characteristics of Respondents

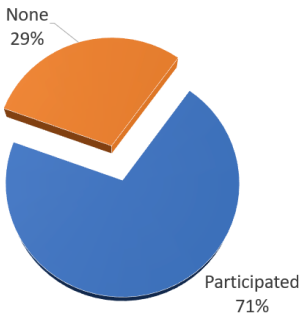

Figure 1: Response Rate

Since the onset of pandemic, the number of international students available on campus had become slightly decreased. This survey was taken place about a year since the pandemic had been announced. However, the response rate seems quite high as over two third (N=110) of total number of students (Figure 1).

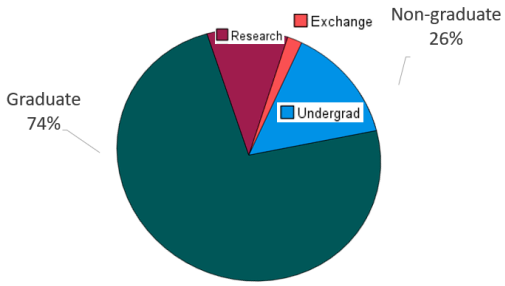

Figure 2: Enrollment Type

Looking at the characteristics of respondents (Figure 2), about three quarters of the total were graduate students, while the rest consisted of undergraduate students, research students and exchange students (hereafter, non-graduate students). This percentage is also proportionate

with the breakdown of international students before the outbreak. The types of respondents also infer about their common daily activities. Graduate students are the group of students who enrolled at master courses or doctoral courses, majorly work at laboratory spending a lot of time to do experiments under supervision laboratory member using mostly English. Graduate students must take some classes, but often at minimal portion of time. Graduate students also must spend a significant portion of time on reading papers, writing reports and preparing for scientific conferences. On the contrary, the non-graduate students, especially undergraduate students and exchange students, spend most of the academic time on taking classes. Research students are those who entered preparatory course, mainly be involved in taking Japanese language classes or learning basic laboratory skills before being enrolled officially.

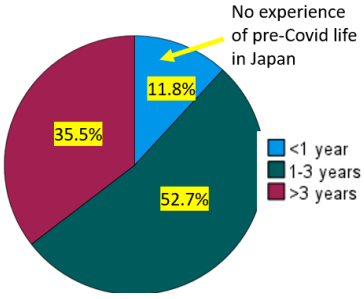

Figure 3. Duration of Life Experienced in Japan

As shown in Figure 3, more than a half of the total number of respondents had been staying in Japan for from one to three years, and around a third had been in Japan for over three years. The rest 11.8% of the respondents had been experiencing life in Japan for less than a year, which means that they had no experience of life in Japan before pandemic.

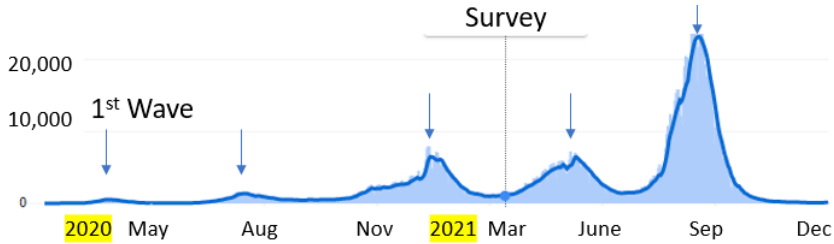

Figure 4: Timing of the Survey (author adapted from JHU CSSE COVID-19 data)

Referring to the Covid-19 pandemic transition in Japan (Figure 4), the latter group had been staying in Japan during the period between the first wave and the fourth wave.

Perceived Pandemic Impacts and Satisfaction with Taking Class Online

The perceived impacts of pandemic to certain aspects of students' life are described in Table 1. The four-level scale ranked from not at all (--), not really (-), some (+) and a lot (++). For all categories of taking class, doing research or life, the 'not really impacted' level of impact was chosen by the highest number of respondents. For taking class, 16.4% replied with 'a lot impacted' but this rate was higher at non-graduate group. This could be understood because the graduate group has less class and therefore become less impacted. For impact on research, more people in the graduate group chosen 'a lot impacted' (9.9%), which could be explained by the fact that graduate group had more research work. However, we could not find statistically significant difference between the non-graduate and graduate group in relation to impact.

	Impact （%）	--	-	+	++
1	Taking class	31.8	34.5	17.3	16.4
	Non-graduate (29)	24.1	31.0	24.1	20.7
2	Research	35.5	39.1	17.3	8.2
	Graduate (81)	32.1	38.3	19.8	9.9

Table 1. Perceived Impacts of Pandemic to Some Aspects of Campus Life

Table 2 shows the results of online satisfaction perceived by respondents. We found that about two third of the total respondents had shown satisfaction, including 45.5% of respondents had shown “moderate satisfaction” and 25.5% of respondents had shown “a lot of satisfaction”. On the other hand, 8.6% of graduate students had shown “no satisfaction at all”. However, there was no significant difference between satisfaction mean scores of graduate students and non-graduate students (T-test, $p>0.05$).

N	— —	—	+	+ +
Total (110)	7.3	21.8	45.5	25.5
Non-grad (29)	3.4	17.2	51.7	27.6
Grad (81)	8.6	23.5	43.2	24.7

Table 2. Satisfaction with Taking Class Online

Table 3 shows the percentages of access to pandemic-related information as perceived by respondents. We found that about two third of the total respondents shown “have enough access to information”, including 48.2% of respondents had shown “moderately well informed” and 20.9% of respondents had shown “very well informed”. On the contrary, 7.4% of graduate students had shown “no access to information at all”, while none of non-graduate students had reported so. There was a significant difference between perceived information access mean scores of graduate students and non-graduate students (T-test, $p=0.002$).

N	— —	—	+	+ +
Total (110)	5.5%	25.5%	48.2%	20.9%
Non-grad (29)	0.0%	13.8%	48.3%	37.9%
Grad (81)	7.4%	29.6%	48.1%	14.8%

Table 3. Perceived Access to Pandemic Related Information

We investigated the correlation of independent variables including enrollment status (graduate and non-graduate), years staying in Japan (up to a year and over a year), Japanese proficiency level (beginner, intermediate and advanced), co-living with family members (no and yes), living in dormitory (no and yes), and self-perceived dependent variables in four-level scale including perceived impact on taking classes, perceived satisfaction of online class, perceived impact on doing research, and perceived access to information. The results of Pearson correlation test are shown on the Table 4.

		Enrollment Status	Years in Japan	Japanese proficiency	Living w. family	Living in dormitory	Access to Info
Impact on taking classes	Pearson	-.132	-.223*	.230*	-.232*	.018	.118
	p-value	.171	.019	.015	.015	.852	.220
Satisfaction of online class	Pearson	-.099	.111	.063	-.015	.019	.338**
	p-value	.303	.248	.513	.879	.844	.000
Impact on doing research	Pearson	.167	.083	.167	.016	.166	-.052
	p-value	.082	.387	.081	.870	.084	.588

Table 4. Correlation Between Independent and Dependent Variables

It was shown a significant association between satisfaction of online class and access to information. This relation could suggest that supporting students to have well access to information could lead to higher satisfaction of online classes. Students who have longer staying time in Japan tend to report less impact on taking classes, probably because these students already get used to taking class in Japan, including online and face-to-face classes. Students with higher Japanese language proficiency tend to report more impact on taking classes, probably because the students with higher Japanese proficiency are often undergraduate students who must take more classes than other students. Living with family shows less effect on taking classes, probably because students who live with family are often graduate students who don't have to take many classes.

		Satisfaction of online class	Impact on taking classes	Impact on doing research
Satisfaction of online class	Pearson	1	-.227*	-.1.27
	p-value		.017	.185
Impact on taking classes	Pearson	-.227*	1	.320**
	p-value	.017		.001
Impact on doing research	Pearson	-.127	.320	1
	p-value	.185	.001	

Table 5. Correlation Between Dependent Variables

Table 5 shows correlation between perceived impact on taking class and doing research with satisfaction of online classes. The results show more impact on taking class tend to lead to less satisfaction of online class, while there is no such a significance between doing research and satisfaction. On the other hand, more impact on taking class tend to be associated with more impact on doing research.

Qualitative Findings on the Impacts of the Pandemic on Taking Classes

The students were asked to describe how their taking classes had been affected by the pandemic. Many voices mentioned in a neutral notion that there were many online classes, but no problem came with that. Some realized that there was a trend for shifting to online class including evaluations and examination. However, many respondents mentioned about limitation of communication as the most visible impact, as they could not communicate naturally with teachers or other students during online sessions. Technical issues were also mentioned such as sometimes it became confusing about schedule because some classes postponed, changed, or canceled, and guidance on mode of class was not given properly. Problem with network access was also mentioned, as sometimes students could not find a

Wi-Fi spots for taking class or might have frequent problems with device or connection. Less commonly, some students reported about having difficulty in learning Japanese online, becoming anxious to attend classes online, having difficulty to take online class at home because of the children, being unable to attend online classes for 1.5 months upon entering and taking quarantine in Japan.

In response to the question why not satisfied with taking online classes, majority of the respondents mentioned about lack of communication with teachers and other students. Some specified that for a foreigner, being in a face-to-face class could be much easier to understand the content and online class might be somehow less efficient since the students could not feel comfortably to practice live communication in Japanese. Technical problems such as poor internet connection or poorly provided guidance for online classes, getting tired from PC lessons for long hours, wanting to record the lesson, MLS notification had been confusing etc.

The students were asked to describe how their doing research had been affected by the pandemic. Impacts on the research were mainly affect the graduate students who had to do experiments at laboratory on site. Many voices reported that the research had been not progressing, their plans had had to change. During the lockdown, these researchers could not consult or discuss with teachers or colleagues about their research because they couldn't enter the laboratory, experiment was canceled or delayed, the experimental animals had to be disposed, attending academic conference had been canceled or gone online. Even for reading or writing papers, it was difficult to do research in the dormitory or at home because of no motivation and difficult to collect materials. Some said that being able to participate academic conferences online could be a good point.

The respondents also specified the need for support that they may expected. The international students realize about social barriers such as Japanese language and culture difference. As foreigners in Japan, they may share common difficulties such as little familiarity of Japanese social support system, especially regarding disaster prevention, medical services, social welfare, and therefore they may have less access to these services compared to Japanese students. The results also specified the need for improving environment for accessing online classes. Students who have difficulty in accessing internet at home may need to use in-campus self-study spaces for taking classes.

Conclusion

This survey has been conducted at 1 year into the pandemic in Japan, when the students already have experienced three epidemic waves from 2020 through early 2021 (Arima et al., 2021; Karako et al., 2021). Online class has become a new normal standard of campus life, as students have gained more and more adaptability with it.

In this paper, the authors have developed a questionnaire containing both Likert-style and open-ended questions to investigate impacts of the pandemic to international students taking class and doing research, the satisfaction level, and obstacles to online learning, as well as the factors which may influence the students' acceptance of online learning. In short, the results show that about a half of non-research students have reported taking class has been impacted, while about 30% of graduate students have reported doing research has been impacted. Japanese proficiency, years of enrollment and family status are found to be associated with impact on taking class. About two third of respondents show satisfaction with online learning.

Access to supportive information from university is found associated with satisfaction level of online learning. The findings also suggest implications for providing support to international students.

The findings have also demonstrated the need for more evidence on if acceptance of online learning could be associated with certain factors, and if online learning could be firmly a new dominant norm of future education. This survey has several limitations regarding study targets such as low participation rate and not being able to make comparison with local Japanese students. The number of variables for investigation has been limited the minimum, therefore have not included some interesting factors such as nationality, scholarship status, age, gender, English language proficiency etc. Although it uses cross-sectional survey mode, there is a possibility of doing a follow-up survey for making comparisons over the timeline.

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Development of Exploring Computer Science With Lynx for Student Learning Geometry and Logo Programming Code

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Research on Logo programming contributing to student learning has appeared in the literature during the last four decades. Empirical and meta-analysis research studies support of teaching Logo coding in developing student cognitive problem-solving skills has been documented using teacher-mediated or guided instruction. Using guided instruction with teacher-mediated scaffolding *Exploring Computer Science with MicroworldsEX* (Walsh 2013-2017) has been found as an effective curriculum in preparing the author's elementary and middle school students using the Logo code language to create geometric graphic, animation, and gaming projects. The instructional curriculum updated to a cloud-based platform *Exploring Computer Science with Lynx* (Walsh 2020) is anticipated to provide continue support to students and teachers in learning Logo coding. The paper will discuss the author's journey in teaching Logo coding to students at the elementary and middle school level over a 30-year period. The classroom field experience along with research on Logo programming contributing to development of an e-book curriculum will be discussed. More research will be needed to study teacher scaffolding and mediation skills to support learning Logo using the Lynx platform along with transfer to other domains including programming environments like Python or JavaScript. Future employment of computer-programming jobs will be best for applicants with experience in a variety of programming languages and newest programming tools (Bureau of Labor Statistics, 2021).

Keywords: Logo Coding, E-book Teaching Curriculum, Scaffolding Instruction, Discovery Learning Projects with Mediation Support, Lynx Platform, Geometry, Programming Skills

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Introduction

The paper will begin defining Logo with the development of the language and how the philosophy of Piaget's constructivism supports student project based learning of programming. The author will then discuss field experience in teaching Logo coding at the elementary and middle school level with examples of student projects. Research supporting guided instruction in student learning Logo coding will be presented. Information based on classroom field experience, findings of a Logo teacher staff development, and research reporting will be presented contributing to development of a guided Logo e-book curriculum. Future direction in teaching Logo coding related to transfer to other domains and programming environments along with use of the Lynx platform will be discussed.

Logo and Development

Seymour Papert and his colleagues at the Massachusetts Institute of Technology (MIT) Artificial Intelligence Laboratory developed logo, which means "word" in Greek, in the late 1960's. Logo was designed to provide an environment in which students can learn as naturally as possible. Papert (1980) envisioned the computer as a means of making learning an active and exciting process and claimed that Logo enabled children to program the computer rather than the computer to program the child. Papert believed that Logo was a tool providing a "Mathland" in which the computer becomes an instrument for students to learn mathematics as naturally as they learn to speak. Papert (1980b) stated that Logo has no threshold and no ceiling. This means that Logo, primarily designed for children, can provide early programming instructional use with preschool handicapped students, and can provide secondary student application in mathematical problem solving, geometric theory, science education, language activities, computer programming, and other content areas. Papert believed that children of all ages and from all social backgrounds can do much more than they are believed capable of doing when given the tools and the opportunity (Papert 1999).

The Logo philosophy of education is described as Constructivism, a theory of learning supported by Jean Piaget. Papert extended the Constructivism of Piaget to include the idea that a good way to support the building of knowledge in one's head is to build something in the real world – a computer program, robot, drawing, or a musical composition. Constructivism is both a theory of learning and strategy of education referred to as child-centered, learner-centered, progressive, active, hands-on, and project-based practices (Logo Foundation 2015). In this Logo environment the role of the teacher is collaborator and facilitator in providing scaffolding support for the students' learning.

Grade 3 Teaching of Logo and LogoWriter in the Schools

Interest in teaching Logo developed in the field as a third grade classroom teacher in the Ames Community School District (ACSD). Students practiced using the early Logo version on Apple computers, with the 'turtle' appearing as a green triangle. Students used turtle primitives, Logo's built-in vocabulary, to draw basic geometric shapes on the amber or green screen monitors, and then saved their projects to 5 ¼" floppy disks or printed them on an inkjet printer. Greater interest and teaching of program coding developed when LogoWriter became available in 1987. At this time the ACSD provided a weeklong staff development in an upgraded Logo version called LogoWriter. With this training Logo instruction increased, supported with the addition of Macintosh computer labs, providing students opportunity to develop graphics incorporating geometric shapes. Grade three students began to build and

combine program procedures to create modular programs. The use of two or more programs (subprocedures) combined into a superprocedure was easy for students to understand once they were given a brief introduction and a demonstration that modeled the process. The students developed coding projects were published in the school writing center for sharing. Examples of the types of projects created are shown in Figure 1. Given this version of LogoWriter, integrated with a Word processing and shape figures, students also developed Logo graphics to accompany adventure stories and created rebus stories (i.e., a rebus story places small images or pictures-turtle stamped shapes substituted for some of the words.)

LogoWriter Modular Programs

- To RowBoat with To Boat and To Row – Rowboat graphic
- To Hat with To Sleep and To Tinsel – Sleeping hat
- To Tarne with To Star, To Circle and To Song – Circle star with tune
- To Wheel with To Circle and To Big – Wheel polyspiral
- To Super with To Sun and To Colors – Sun polyspiral
- To AO with To Awesome and To Orbit – Space object
- To Super with To Move and To Spiderweb – Spider in web
- To Super with To Sharkfin and To Water – Shark fin in water
- To Design with To Star, To Balloon, and To Square – Enclosed star graphic
- To Super with To Squad with To Arrest – Helicopter below sun spiral

Walsh (2013-2017)

Figure 1. Grade 3 LogoWriter Superprocedures with Subprocedures for Turtle Graphics

When Lego building blocks integrated with Logo coding became available, third grade students would work together in cooperative groups to create programs to run the machines they built (e.g., washer, car, or conveyer belt). Once students knew the basics of the programming language, they were able to transfer their knowledge of how to write programs for the turtle to writing programs for the Lego machines.

Research Support for Guided Instruction in Student Learning Logo Coding

Based on field experience with third graders, showing engagement and enthusiasm in learning coding, fostered interest in developing a Logo curriculum based on a hierarchical sequential presentation of Logo concepts (i.e., developmental progression of commands leading toward building program procedures). It was found providing some structure in the teaching of Logo concepts using student handouts, posters, and flashcards supported students learning of Logo primitive commands for developing Logo programs and turtle graphics.

Support for a more structured methodology in the teaching of Logo was substantiated in an inservice model implemented as a dissertation study at Iowa State University. The study is summarized as follows:

> The primary goal of the study was to develop a teacher-training model to improve and increase teacher use of Logo in the classroom. The in-service model was delivered to a sample of teachers in the ACSD and the research study found, based on profile interpretations on the Stages of Concern Questionnaire (Hall, George & Rutherford, 1986) and other data, all participants (except one n=18/19) made substantial shifts in concerns to higher stages. This suggests all participants (except one) had earlier concerns resolved and were ready to use Logo with students (Walsh 1992-1993).

In addition, the results from the study indicated that teachers were planning to instruct nonprogramming and programming aspects of Logo through discovery learning and problem-solving. Using a structured inservice training approach to learning Logo concepts and program procedures with training components (e.g., activity pages for classroom use, coding examples, teacher collaboration with cooperative learning, and time to develop projects) were found effective in developing Logo cognitive skills and promoting positive teacher attitudes toward using Logo with students.

Further support for developing a structured teaching approach for Logo instruction using discovery project-based learning was provided by a graduate colleague study at ISU conducting a Logo research project. Lee (1990) studied a cognitive monitoring strategy used for developing a guided programming project. The strategy involves having participants drawing the desired Logo graphic outcome by hand, decomposing the steps to write a program, writing a plan, writing codes or subprocedures, testing and identifying errors, and debugging the program. With Lee's permission to use cognitive monitoring in the classroom students were found to effectively problem solve using the strategy in developing Logo graphics and debugging program code errors.

Further support in teaching Logo using guided instruction and teacher scaffolding, along with benefits derived from this method of teaching, was found when conducting a literature review. It was found that research on Logo's contribution to student learning has appeared in the literature during the last four decades. Research on potential benefits, using teacher-mediated or guided instruction, is summarized as follows:

- Contributing to understanding of geometric concepts
- Facilitating students' understanding of geometric conceptualizations and thinking (e.g., understanding of angle sizes and geometric shapes)
- Increasing understanding of geometric transformation (symmetry, slides, and rotations)
- Supporting the development of cognitive and metacognitive skills (e.g., planning skills) including measures of creativity
- Improving problem-solving in decomposition skills, error recognition, and feedback
- Gains in divergent thinking, field dependence/independence (relationship of figures), and impulsivity/reflectivity
- More time on-task in problem solving, correcting of program errors, and benefits in self-esteem social skills during cooperative learning (Walsh 1994).

Some studies have suggested that Logo experiences using teacher-mediated instructional practices produce positive near transfer (e.g., debugging Logo programs transfers to map reading directions) and far transfer (to higher order thinking in another content subject area). These benefits along with others have been substantiated supporting learning Logo coding for developing critical thinking, task persistence or determination, problem-solving, processing skills, trial and error, geometric spatial visualization (Heggart 2014, Pardamean & Suparyanto 2015, Williams 2021, Porter 2021 and Khormi et.al. 2021) along with improved social skills and self-confidence (An 2017 and Morris 2021).

Of notable interest regarding the teaching of Logo was provided by Littlefield et. al. (1989). These authors reported the method of teaching Logo and its effects on the development and transfer of general thinking skills from the Logo environment to non-Logo problems needs consideration. The study of student learning providing structured and unstructured learning environments found support for goal-oriented structure in the training program using

mediated teacher intervention. Littlefield et. al. (1989) report the features of mediation that apply directly to Logo instruction include framing, which involves the act of relating specific sets of behaviors to a broader framework of problem-solving (e.g., breaking down Logo subprocedures into manageable components). Another feature is bridging, which involves the act of relating processes that occur within one context to similar processes occurring elsewhere (e.g., using mediation to relate right and left turn degrees to time on a clock).

Further support for teacher mediation and scaffolding was provided in two meta-analyses conducted by Alfieri et. al. (2011) using a sample of 164 studies examining the effects of discovery learning practices. Most of these studies involved teaching domains in math, science, problem-solving, and computer skills. The results of the first meta-analysis indicate that unassisted discovery does not benefit learning. The analysis also found direct teaching is better than unassisted discovery; provide learners with worked examples, and use of timely feedback. The implications here suggest students benefit when provided with examples of Logo programs and procedures as learning models. The study also reports that students may benefit from individualized feedback on homework assignments with worked examples provided. The second meta-analyses suggest that teaching practices should employ scaffolding tasks that require learners to explain their own ideas. These authors report that feedback; worked examples, scaffolding, and elicited explanations are needed for learners to be redirected, to some extent, when they are misconstruing. Research supporting these student benefits are based on providing more structured presentation of coding procedures with programming model examples accompanied by teacher feedback, mediation and scaffolding of student learning (Littlefield et. al. 1989 & Alfriei et. al. 2011). Alfieri et. al. elaborate on this idea stating:

> *Feedback, scaffolding, and elicited explanations do so in more obvious ways through an interaction with the instructor, but worked examples help lead learners through problem sets in their entireties and perhaps help to promote accurate constructions as a result* (Alfriei et. al. 2011, 12).

The findings suggest that unassisted discovery does not benefit learners, whereas feedback, worked examples, scaffolding, and elicited explanations do.

Given initial fieldwork in coding with students, dissertation research with literature review, and support for more structured learning environment (e.g., cognitive monitoring) direction was provided for developing a Logo curriculum for student use to support teacher instruction. Activities for the curriculum were developed based on experience in the field working with students on Logo coding projects. A sequential lesson planned curriculum was needed balancing a structured discovery-learning environment for Logo project development supported by teacher scaffolding.

MicroworldsEX in the Schools and e-Book Development

During teaching tenure in the ACSD MicroWorldsEX became available for third grade students to create coding projects using this upgrades platform developed from Logo Computer Systems (LCSI). Teaching effectively required using teacher-mediated instruction to support student development of Logo programs in a discovery-learning environment for project development. With MicroWorldsEX and greater access to computers students had more time to develop Logo graphic programming projects. Some modular title programs with subprocedures and graphic names, developed by students are listed in Figure 2.

MicroWorlds Turtle Modular Super Programs

- To Super with To Trisqu and To Octahex – Overlapping octagon, hexagon, square, and triangle
- To Superpentaflower with To Superstar, To Pentagon, and To Flower – Flower graphic
- To Goku with To Meany, To Fatty, and To Calvin – Polyspiral circular design
- To Nesttunel with To Nest and To Tunel – Bird nest in a tunnel
- To Thingy with To Circle, To Karlie, To Wingy, and To Buggy – Cross-eyed face with red mouth

Walsh (2013-2017)

Figure 2. Grade 3 MicroWorldsEX Superprocedures with Subprocedures for Turtle Graphics

Using teacher scaffolding, students created modular programs such as the example created by a student displaying stacked slices of lime:

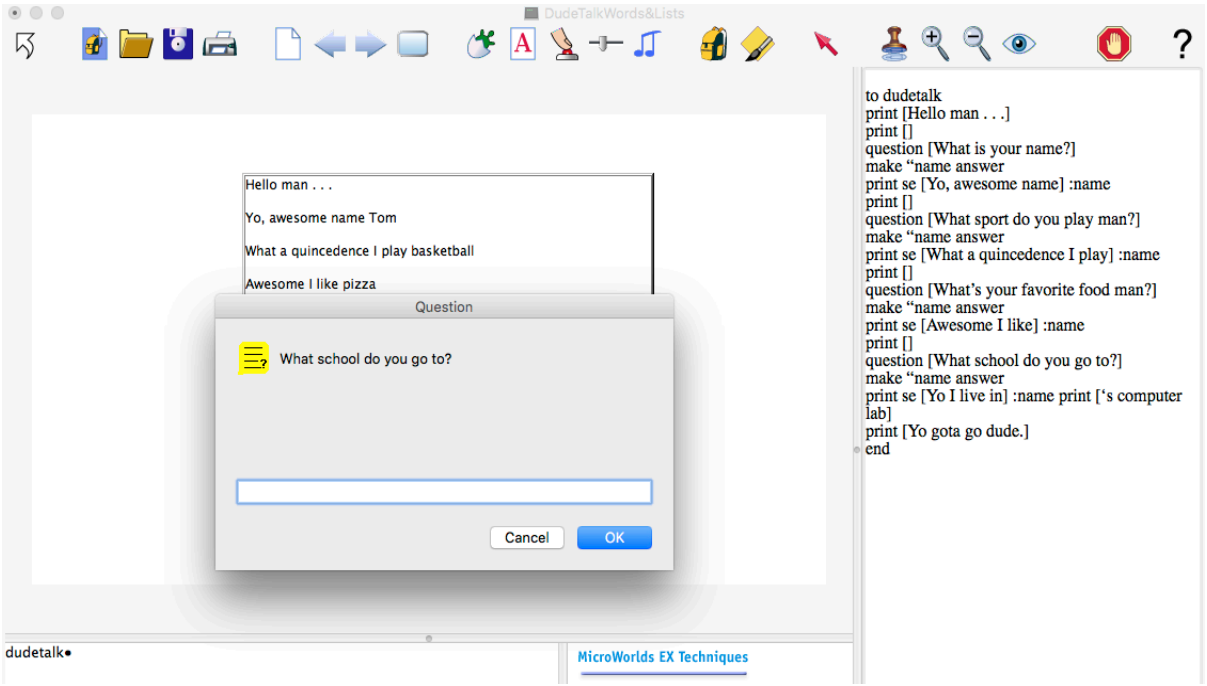
```
to limes
repeat 7[flower fd 60 rt 180]
end

to flower
setpensize 12
setc 67
repeat 60[triangle2]
setc 63
setpensize 3
repeat 30[triangle2]
end

to triangle2
repeat 3 [fd 30 rt 120]
rt 30
end
```

It was found with MicroWorldsEX students used program primitives to create simple recursion procedures and wrote codes using variables. For example, students enjoyed using recursion programming in which the name of the procedure itself (e.g., **triangle**) is used as the final instruction in the same procedure (just before the **end** line), so that the whole program runs repeatedly. Using recursion students would develop projects with overlapping shapes to create designs or polyspirals, sometimes making a flower pattern. Many students were able to add one or more variables to their program procedures. Below is a student example of a recursive variable program typed to create a turtle spider web:

```
to triangle :size
if :size > 150 [stop]
repeat 3 [fd :size rt 120]
rt 30
triangle :size + 3
end
```

Working with students in the Logo environment it became evident that levels and sophistication of coding projects varied given the diversity of the classroom. Some

exceptional students were able to work ahead and develop animation program procedures. Another students was able to use the words and lists feature of MicrowordsEX to create interactive conversations (Figure 3).



Walsh (2013-2017)

Figure 3. MicroWorldsEX Version of a Student Interactive Words and Lists Project

It was found in the classroom that the Logo teaching environment provided inherent differentiation for instruction evident in the varied application of program procedures and use of the Logo language. The difference in sophistication of coding projects was evident, particularly when students were integrated from resource room or mainstreaming programs. Sharing of graphic project designs in class were presented on-screen or printed for publication at the school writing center.

Continued tenure in the ACSD provided opportunity teaching Logo coding to grade six gifted students at the middle school as part of math instruction in the Extended Learning Program (ELP). Using MicroworldsEX lesson plans were further developed and extended to cover more advanced programming procedures and project work in creating turtle geometric graphics, animation, and interactive conversations. In addition to meeting with ELP math groups, coding with MicroWorldsEX was provided to all grade six classrooms covering the following activities:

- Practice with turtle primitive commands for graphics
- Use the repeat procedure to explore and create geometric shapes
- Create graphics by using the button tool
- Teach the turtle a new word by writing a procedure
- Apply program tool procedures (e.g., text boxes).

Instruction at this time with students receiving services in ELP and in the classroom included visual demonstration of primitive commands, program procedures, and use MicroworldsEX tool features (e.g. button, text box, or linking pages) added to a Logo project. Students were provided with support materials including flashcard practice of Logo primitives, activity handouts listing turtle code commands for practicing, brief explanations about entering

different program procedures (e.g., recursion, variable, interactive, and animation), and use of posters showing program procedure examples. It was found to be helpful in providing students handouts and practice using degrees to support their geometric turtle graphic projects.

The cognitive monitoring strategy was used most effectively with grade six students in developing a student guided programming project. The strategy (Lee, 1990) was written as a handout with lines and boxes for the planned graphic, decomposition (main shapes), written plan, program executed code, outcome graphic and debugging steps. For example, a student wants to draw a house. The decomposed shapes identified are a triangle on top of a square, and this is hand-drawn as the planned graphic. The student writes the plan as a program with a roof (the triangle) and a square. The executed program may be written as follows:

```
to house
repeat 3 [fd 100 rt 90]
fd 100 rt 90 fd 100 rt 90
rt 45 lt 45
end
```

The executed graphic created with this program turns out not to be a house, which means the student must debug the program and keep trying the new versions until the desired drawn graphic outcome is achieved. The cognitive monitoring strategy involves student planning skills, metacognitive thinking, and problem solving. It was found students need support when initiating the planned activity in developing a project idea that is not too difficult or easy to solve. Some graphic ideas developed by students were too difficult for planning and debugging. It was found that showing students how to debug procedures is a helpful strategy for finding and fixing code errors. This also alleviates time required by the teachers in finding student errors, especially for large classroom sessions.

Development of Curriculum Programs

Incorporating graduate research conducted at Iowa State University along with learning activities provided for elementary and ELP students contributed to development of a curriculum program for teaching Logo coding to students. *Exploring Computer Science with MicroworldsEX* (Walsh, 2013-2017) LCSI published e-book was written as a structured learning methodology of learning activity lessons, with opportunities for discovery and exploration, to support student learning in a "Microworlds" project-based environment to create geometric graphics, animation, and gaming using the Logo programming language.

Guided instruction was found for the potential cognitive benefits for teaching Logo to be achieved by implementing more carefully planned teacher-directed lessons balanced with student problem solving and discovery learning using teacher-mediated scaffolding. Working with students to develop their programming skills requires curriculum support with handout information about turtle primitives, along with examples of programming procedures. The teacher provides the scaffolding and guided questions to support student development of workable program procedures. Students can approach programming using a top down strategy (in other words, writing code directly into programs and testing outcomes in the Command Center) or bottom up strategy (students test parts of the program in the Command Center and paste pieces of workable code into program procedures). Teachers will find themselves learning with the students as they discover innovative ways to use and apply program procedures. Since teacher time is usually limited, students should learn to debug

procedures, for instance, by testing code line-by-line and working with student teams to solve their problems.

Additional experience teaching Logo coding using MicroworldsEX and the e-book was developed providing instruction to high ability elementary and middle school students for an Early Outreach Program (EOP) at Iowa State University. It was found working with this population, particularly middle school students, Logo coding project development showed advanced graphic designs and included interactive games. Some examples of project ideas developed by students are listed in Figure 4.

Graphic Program Projects
- Graphic design using a slider tool
- International flag program with button coding procedures
- Rubic cube program
- Sailboat graphic with random color sails
- Mobile phone graphic design

Game Program Projects
- PS4 game controller interactive words and lists
- Turtle invader game design procedure
- Survey quiz using buttons for answering trivia questions
- Pong game with animated moving ball
- Coin flip program
- Moving chessboard pieces with reset button
- Turtle animation race
- Hide and seek with trivia game

Figure 4. EOP Middle School Turtle Graphics and Project Games

In 2020 LCSI upgraded the Logo coding program to a cloud-based platform. During this time the MicrowoldsEX e-book was revised for use with Lynx. Edits, updates, and additions included a research article on teaching Logo coding, animation procedures, and using interactive words and lists for developing games. A final section of the text suggests examples of interactive games to review at the Lynx website. The e-book *Exploring Computer Science with Lynx* (Walsh 2020) is downloadable at LCSI @ https://lynxcoding.club/. The MicroworldsEX and Lynx e-book have been available for the Canada Cancode 1.0 and 2.0 programs launched in 2017 and renewed in 2019 providing $110 million in federal monies. CanCode 3.0 will receive $80 million in 2021. The programs are providing support for kindergarten to grade 12 students, with teacher training, in digital skills to prepare for future jobs.

Future Research Directions

Logo was discussed as a coding language with the potential to achieve cognitive benefits. These benefits are given when more carefully planned teacher-directed lessons are balanced with student problem solving and planned discovery using teacher-mediated scaffolding. Support for more carefully planned, teacher-directed lessons during initial introduction and learning of Logo skills is provided in the literature. *Exploring Computer Science with Lynx* provides a curriculum methodology for teacher delivery of Logo coding skills to students balancing teacher direction with planned discovery. Teachers will need to serve as facilitators to provide student support by scaffolding student questioning and directing independent Logo programming exploration. More research will be needed on specific teacher mediation

intervention techniques, in addition to better understanding what is required to facilitate successful transfer of problem-solving skills from Logo to other domains including coding in different languages.

Conclusion

Empirical and meta-analysis research studies support of teaching Logo programming in developing student cognitive problem-solving skills has been documented. Using guided instruction with teacher-mediated scaffolding has been found as an effective method in preparing students using the Logo code programming language to create geometric graphic, animation, and gaming projects. Anecdotal classroom benefits in teaching coding have been found along with research on Logo's contribution to student learning. Research on potential benefits, using teacher-mediated or guided instruction is discussed along with curriculum methodology for teacher delivery of Logo coding skills to students balancing teacher direction with planned discovery. Teacher scaffolding strategies are presented including cognitive monitoring. Anecdotal student benefits learning Logo coding in the classroom along with differential instruction outcomes have been presented. Hopefully, opportunity to teach Logo instruction using the Lynx program will be provided to enthusiastic coder learners in the future!

Acknowledgements

The author as a classroom teacher providing instruction in Logo coding acknowledges with appreciation the students at the elementary and middle school level in supporting his learning of Logo and gaining insight into their strategies using coding skills. Recognition is also given to my major Professor Dr. Ann Thompson who inspired interest and facilitated research work at Iowa State University in Logo programming contributing to development of the curriculum e-books.

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Examining the File Renaming Errors Made by Japanese University EFL Students During the First Year of Emergency Remote Teaching

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The move to emergency remote teaching (ERT) in 2020 due to the COVID-19 pandemic forced instructors worldwide to necessarily include components of information and communication technology (ICT) in their lessons. However, this move proved particularly challenging in Japan, for the country has long lagged behind others in its implementation of ICT for educational purposes. While many university instructors in Japan were able to successfully provide ERT courses that utilized new or heretofore rarely used ICT (e.g., Zoom, learning management systems), students' general lack of basic personal computer skills remained a persistent concern. Aware of both Japan's ICT shortcomings and students' anxiety and confusion regarding the transition to online learning, an instructor/researcher (I/R) teaching English as a foreign language at three Japanese universities opted to make heavy use of email – a standard digital tool widely used for decades – for assignment submission and student-teacher communication purposes. In spite of email's many inherent advantages, the I/R unexpectedly received a large number of email attachments that were not renamed according to the repeatedly-explained file renaming convention established for all emailed documents. The current paper presents analyses of the file names of a subset of emailed documents the I/R received during academic year 2020, with the research goal being to categorize the file renaming errors so that their likely sources could be determined. Because the errors arose from multiple and varied sources, explanations about and recommendations for pedagogical practices (e.g., the giving of instructions, typing in a foreign language) are proffered.

Keywords: COVID-19, Emergency Remote Teaching, Japanese University, ICT, Computer File Names, Errors, Mistakes

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Introduction

With the move to remote teaching and learning (RTL) due to the novel coronavirus (COVID-19) pandemic, instructors were forced to alter their typical teaching methodologies and find ways to present their course material and conduct their classes remotely in an online format. Although many information and communication technology (ICT) tools like university learning management systems (LMSs) and video conferencing applications (e.g., Zoom) were widely available to aid in this transition, which teachers were generally willing and able to adopt (Wen & Tan, 2020; Winter et al., 2021), there were nevertheless concerns that students would be unprepared and ill-equipped to make this unexpected yet necessary transition to mandatory online learning (Bettinger & Loeb, 2017).

These concerns were particularly strong in Japan, due in no small part to the country's rankings in ICT implementation in educational settings being considerably lower than those of other nations (Maita, 2020; Nae, 2020; O'Donoghue, 2020; OECD, 2020). To address this concern in the face of time constraints brought on by the move to what Hodges et al. (2020) termed *emergency remote teaching* (ERT), some instructors essentially followed others' advice (e.g., Czerniewicz, 2020; Heuvel, 2020) of relying upon well-established existing systems to keep things as simple and understandable for the students as possible.

In line with such thinking, the author of the current article (who is also the instructor/researcher, or I/R) designed his Japanese university-level ERT English courses for academic year 2020 (hereafter, AY2020) such that students were to use, as much as possible, well-known standard digital methods to engage in their coursework. To this end, the I/R requested students to submit all course-related documents[1] for grading and feedback purposes in Microsoft Word or PDF format as email attachments instead of sending them by other means (e.g., by use of the university's LMS).

Although course participants generally regarded the use of email and email attachments to be simple, easy to understand, and effective during ERT (Rubrecht, forthcoming), there was one component of this method that was unexpectedly problematic: many students failed to rename their submitted files in the manner requested by the I/R. Unfortunately, due to the sudden and unforeseen nature of the commencement of ERT in response to the pandemic, it was impossible to predict that file renaming would become the issue that it became during ERT. As such, a pre- and post-ERT-commencement research study on file renaming could not be planned. However, this did not preclude the possibility of ad hoc analyses being conducted to determine the types of file renaming mistakes[2] students made in order to pinpoint their likely sources. The results of such analyses could lead to suggestions for improved pedagogical practices (possibly including those regarding the use of ICT and other digital tools during ERT and beyond) as well as indicate future research directions.

Background

Much like ERT itself, the present research study was not planned prior to 2020. Its purpose was to categorize, tally, and analyze the *types* of renaming mistakes students made with their

[1] Most such documents were available as answer sheets downloadable from the I/R's website.
[2] In the field of second and foreign language teaching and learning, distinctions are made between the terms "error" and "mistake." However, because it was impossible to definitively classify all incorrectly renamed file names as being made from students making either one or the other (as "errors" and "mistakes" are defined within the field), no distinction between these terms is made here.

digital document files during ERT so that the sources of those mistakes may come to be identified, that is, to possibly determine *why* the mistakes had been made. In order to ground the results of analyses, four interrelated areas deemed relevant to the study's context will first be relayed. These areas are (a) the following of instructions, (b) students engaging in mandatory remote learning for the first time, (c) students' use of personal computers, and (d) typing (or "keyboarding"). Each of these areas ultimately had bearing on the results of the study. Each will now be briefly discussed in turn.

Area 1: The Following of Instructions

The ability to follow instructions is a skill required for the successful navigation of and participation in everyday life. Yet as simple as the act of following instructions may appear to be, it is actually rather complicated, as numerous conditions (e.g., one must comprehend the syntax of the instructions, the instructions must be held in memory until task completion) must be fulfilled and other issues (e.g., those of attention to and motivation for task completion) must be dealt with (Gill et al., 2012). As such, there is much interest in finding ways to keep students from ignoring instructions (Linsin, 2012) and have them follow them accurately (Waterman et al., 2017).

The consequences of not following instructions run the gamut from mild (e.g., annoyance) to severe (e.g., serious bodily harm or death). Generally speaking, academic settings are low-risk/ low-consequence environments, which is why some students ignore instructions by not completing those tasks that they deem trivial (see Iivari et al., 2020). Nevertheless, a student's ability to follow instructions can ultimately impact their grades, their learning or mastery of subject matter, and their ability to correctly execute actions (Dunham et al., 2020), not to mention the overall pace of instruction and classroom participant frustration levels should instructions constantly need repeating.

The student participants in the present study made numerous mistakes with their file renaming, even after explicit instructions were given and repeated through various modes (see below). It is therefore suspected that in at least a few cases (particularly at the start of ERT) mistakes arose because the students had trouble processing the information presented them or understanding the language used for the instructions (Morin, 2021). In other cases, students may have forgotten parts of the instructions, failed to realize that the instructions existed, or failed to internalize or actually follow the instructions. These are the most common type of instruction-following mistakes and indicate limited working memory problems, missteps related to social and historical effects (e.g., peer pressure), and metacognitive limitations, respectively (Dunham et al., 2020).

Area 2: Engaging in Mandatory Remote Learning for the First Time

Alvarez (2020) conducted a study with university students at the beginning of the pandemic to determine the lived experiences of learners forced to engage in ERT. All four themes that emerged from this research (i.e., poor or no internet access, financial constraints, lack of technological devices, and the need for emotional support) could be said to have an *affective* component to them, that is, facets of all four themes could induce stress or anxiety in students as they endeavored to make sense of their new situation, engage in their courses remotely, and, ultimately, not be left behind, either in their present courses or as they prepared themselves for job hunting and entry into the workforce after graduation. Given that other researchers have found similar themes (e.g., Iivari et al., 2020) and have identified ERT as a

time of extreme anxiety, uncertainty, depression, and isolation (Aguilera-Hermida, 2020; Huckins et al., 2020; Jean-Baptiste et al., 2020; Koetsier, 2020), it is speculated that the student participants of the current study often had many pressing matters and areas of concern that occupied their thoughts over and above that of file renaming.

Area 3: Using Personal Computers

An examination of nearly any metric in the Organisation for Economic Co-operation and Development's (OECD's) PISA (Programme for International Student Assessment) results (PISA, 2018) finds Japan's ICT-use rankings far from enviable. Because technology has continually failed to become normalized in Japanese educational settings (see Bax, 2011, as cited in Mehran et al., 2017; Nae, 2020), students in Japan have generally had less access to – and thus are generally less familiar with – ICT than their counterparts in other countries (Maita, 2020; O'Donoghue, 2020). In fact, according to data collected two years before the onset of the pandemic and the commencement of RTL, only 61% of students in Japan were found to have a personal computer that could be used for schoolwork (which is a figure considerably lower than the OECD average of 89%), and of the 30 countries surveyed, Japan ranked last in terms of how frequently students used computers outside of school to engage in and complete school-related tasks (PISA, 2018).

From a technological standpoint, many so-called "digital native" (Prensky, 2001) Japanese university students appear to not have been sufficiently prepared to begin remote learning. A general lack of access to personal computers coupled with extraordinarily high smartphone use rates among Japanese youth (nippon.com, 2019) suggests that students are far more cognizant of and versed in smartphone *tapping and swiping* gestures when interacting with digital web devices and not *mouse clicks and typing on a physical keyboard* (see below). Also, smartphones function well as devices for accessing or uploading web content (e.g., videos, photos) but are suboptimal for word-processed document creation or manipulation (Dhoray, 2020), which may explain why Japanese students tend to see smartphones more as personal rather than as educational devices (White & Mills, 2014). Because downloading files onto smartphones is typically less common than it is on personal computers, the need to recognize and manipulate file names on such devices is generally less important and inconsequential. Additionally, heavy smartphone users typically rely on dedicated apps (e.g., Line, Messenger) for communication purposes rather than email. Although there were cogent reasons for the I/R selecting email as the mode of communication during ERT (see Rubrecht, in print), smartphone users typically only view rather than download and organize email attachments.

Area 4: Typing

Related in part to personal computer use as explained above, it was expected that students would rename their files by typing (or "keyboarding") on physical personal computer keyboards[3]. However, there were several areas of concern here. First, if students indeed lacked general proficiency with personal computers, as suggested above, then typing on a physical personal computer keyboard would have likely been a *pecking* rather than a *touch-type* affair with no smartphone predictive text algorithm assistance to aid in file renaming. The result: typing would become a more cognitively-intensive task for them.

[3] Students were generally expected to gain access to and use personal computers for the completion of most if not all of their remote assignments for all of their university courses.

Second, the act of keyboarding may have been particularly difficult for some students. Text generation, be it by typing or handwriting, essentially requires three things: working memory, an activation of executive functions, and a physical component (Berninger & Winn, 2006), but all three require distinctly different skillsets (Rogers & Case-Smith, 2002). Students with low keyboarding skills would have been far more likely to focus their attention and resources on the *physical act of typing* rather than on *higher-order processes* like planning or revising, with the result being poor-quality text (Barkaoui, 2014). Third, because RTL stifled students' growth as self-regulated learners (Biwer et al., 2021), especially when there was no intervention (Cai et al., 2020), the students in the present study may have been further disadvantaged, as the skills required for self-regulated learning (i.e., the ability to work independently, self-evaluate, and become motivated for task engagement) are precisely those "typical and necessary for the successful mastering of keyboarding skills" (Lubbe et al., 2006, p. 285).

Finally, in cases of second or foreign language (L2/FL) learning, there has long been concern that typed output (e.g., words, sentences, paragraphs) mixes displays of both L2/FL proficiency as well as keyboarding skills (Taylor et al., 1998). There are indications that such proficiency and skills are not necessarily related (Barkaoui, 2014), but this may not be the case for all learners in all contexts.

Participants, Courses, and Methodology

The participants in the current study were 144 students of varying years and majors from eight different courses at three separate Japanese universities in the Tokyo metropolitan area. They were enrolled in a mix of English grammar/communication, lecture, and seminar courses with the I/R throughout AY2020, and all had agreed to participate in this study.

Due to the different courses having a different number of homework assignments to be emailed, the submitted documents analyzed in this study consisted solely of students' weekly Attendance Record Sheets (ARSs). The ARS is discussed in greater detail elsewhere (Rubrecht, 2020, 2021, in press), but in brief, it is a document that was created by the I/R that was meant to be used during RTL to simultaneously take student attendance as well as act as a student-teacher communication tool, as students were instructed to submit an ARS as an email attachment each week of lessons.

On the ARS they were to (a) indicate that they were on target with engaging in and completing their remote lessons and (b) provide comments or ask questions about lessons or their remote learning if they had any. Due to being physically distanced, students being metacognitively aware of their own learning and progress was thought key to their following instructions remotely (see Dunham et al., 2020), so the role and importance of the ARS was repeatedly stressed, particularly how ARS completion allowed students the opportunity to assess, monitor, and evaluate their own performance and learning behaviors (Agran et al., 2005; Sitzmann & Ely, 2011).

The I/R established the *proper file renaming convention*, or PFRC, for all submitted documents (i.e., for both the ARS and all emailed assignments) in order to streamline the grading, organizing, and possible future retrieval of students' many emailed documents. In the case of the ARS, students were to download the ARS template in either Microsoft Word or PDF format from the I/R's website, complete it, and then change its generic file name on the personal computer from "Attendance Record Sheet (ARS)" to that which had identifying

information in the following order (with single spaces separating all words and numbers):

- first and last name
- lesson day and period
- month and day of that week's lesson
- document identification information

Thus, an ARS renamed in accordance with the PFRC would look like the following example (excluding file extensions):

Taro Tanaka Wednesday 1 May 13 ARS

Both prior to and throughout AY2020, students were told repeatedly by download handouts, on-demand videos, synchronous Zoom session explanations, and LMS announcements[4] about the PFRC, the importance of the order and type of information in the PFRC, and the reasons why renaming was required. Similar to others' suggestions regarding the creation and dissemination to students of digital plans that detail procedures and establish expectations for remote course engagement (e.g., Koehler & Farmer, 2020), nearly all of the I/R's students were provided Weekly Schedules prior to the commencement of each semester[5]. These Weekly Schedules explained the semester's activities week-by-week. They also provided links to all on-demand videos and download handouts, including the ARS template. Students were also provided examples of the renamed PFRC document file names to be submitted each week.

Because so many students submitted improperly renamed files in the first (i.e., spring) semester, the I/R added a small grading component to file renaming from the fall semester. It was hoped that this would (a) focus students' awareness on renaming, (b) increase their sense of purpose for the task (see Watson, 2021), (c) show that renaming was something within their control[6], (d) increase student accountability (see Dunham et al., 2020), and (e) ease the I/R's workload.

The file names of each ARS submitted during AY2020 were examined to see if they conformed to the PFRC. Deviations were noted, categorized, and tallied by use of a spreadsheet application. In some instances, ARS file names contained multiple mistakes, with each individual mistake being counted.

Results

Prior to presenting the details and results of analyses, some background information must first be relayed. The total number of expected ARS submissions in the 12-week-long spring semester (hereafter, AY2020-S) was 1,728. For the 14- to 15-week-long fall semester (AY2020-F), the total was 2,056, making AY2020's total 3,784. Ultimately, 3,586 ARS files were submitted: 1,674 and 1,912 each semester, respectively. In AY2020-S, 616 (37%) of ARS documents had file names with at least one mistake. In AY2020-F, the number of file names with mistakes made that semester dropped significantly but were still conspicuous: 206 (11%). This improvement can likely be attributed to the grading component placed on

[4] Explanations were occasionally given in Japanese.
[5] Weekly Schedules were not used in the I/R's seminars, which had 24 students enrolled in total.
[6] It was not uncommon for students to experience technical problems (e.g., poor internet connections, Zoom or computer crashes) that were outside of their control.

PFRC adherence and students having become used to RTL and the I/R's requirements. There was an AY2020 total of 822 (23%) incorrectly renamed ARS attachments, which amounted to nearly one-fourth of all ARS submissions[7].

For analysis purposes, the file renaming mistakes were first categorized by placing them into one of three categories: *instruction-based mistakes* (e.g., when students failed to rename an ARS at all or did so without apparent reference to the PFRC), *detail-based mistakes* (e.g., mistakes with the order of PFRC information in file names), and *typographical mistakes* (e.g., incorrect capitalization, word misspelling, missing or extra spaces between file name words). The specific types of mistakes were given unique identifier numbers and number/letter combinations in brackets (see below). The mistakes were then tallied[8].

Instruction-Based Mistakes

There were relatively few mistakes of the first category type. Tally and calculation results are presented in the following example manner:

A (B%, C%), D (E%, F%), G (H%)

A = AY2020-S tally total
B = percentage of this type of mistake made in AY2020-S
C = percentage of this type of mistake in AY2020
D = AY2020-F tally total
E = percentage of this type of mistake made in AY2020-F
F = percentage of this type of mistake in AY2020
G = AY2020 tally total
H = percentage of this type of mistake made in AY2020

[1] ARS not renamed at all
18 (2.9%, 2.2%), 0 (0%, 0%), 18 (2.2%)

[2] ARS renamed but without any reference to the PFRC (e.g., "My sheet for today's class")
26 (4.2%, 3.2%), 4 (1.9%, 0.5%), 30 (3.6%)

Mistake totals for this category type are:
44 (7.2%, 5.4%), 4 (1.9%, 0.5%), 48 (5.8%)

Detail-Based and Typographical Mistakes

The mistakes in these categories are fundamentally different from instruction-based mistakes because the students had apparently attempted to follow the PFRC but either failed to do so completely (e.g., by not including information) or included typing errors (e.g., misspellings or improper capitalization). Thus, the mistakes in the remaining 774 AY2020 ARS file names were considered to be *PFRC-aberrant mistakes*. Because each file name could evince multiple such mistakes, the number of total mistakes within the file names required tallying rather than simply tallying the number of erroneously renamed ARS documents. There were

[7] Many of the file names of students' thousands of submitted homework assignments and reports in AY2020 were also renamed incorrectly.
[8] Some calculations evince rounding error.

867 and 255 PFRC-aberrant mistakes in the spring and fall semester ARS file names, respectively, making a total of 1,122 for AY2020. Calculation presentations consequently required inclusion of I through M:

A (I%, J%), D (K%, L%), G (M%)

I = percentage of this type of mistake made in AY2020-S
J = percentage of this type of mistake made in AY2020
K = percentage of this type of mistake made in AY2020-F
L = percentage of this type of mistake made in AY2020
M = percentage of this type of mistake made in AY2020

Detail-Based Mistakes

There were considerably more mistakes of this type compared to instruction-based mistakes. Calculations of several subcategories are also given.

[3] Order of information
23 (2.7%, 2.0%), 0 (0%, 0%), 23 (2.0%)
[3A] Japanese name order (e.g., "Tanaka Taro" instead of the English order of "Taro Tanaka")
4 (0.5%, 0.4%), 0 (0%, 0%), 4 (0.4%)
[3B] Order of information to be included (e.g., "1 Wednesday" instead of "Wednesday 1")
19 (2.2%, 1.7%), 0 (0%, 0%), 19 (1.7%)

[4] Incorrect information
10 (1.2%, 0.9%), 10 (3.9%, 0.9%), 20 (1.9%)
[4A] Wrong class day
0 (0%, 0%), 0 (0%, 0%), 0 (0%)
[4B] Wrong class period
1 (0.1%, 0.1%), 0 (0%, 0%), 1 (0.1%)
[4C] Wrong lesson day
8 (0.9%, 0.7%), 7 (0.4%, 0.6%), 15 (1.3%)
[4D] Wrong lesson month
1 (0.1%, 0.1%), 3 (1.2%, 0.3%), 4 (0.4%)

[5] Missing information (e.g., lesson day)
28 (3.2%, 2.5%), 6 (2.4%, 0.5%), 34 (3.0%)

[6] Unrequested characters or information (e.g., student number)
149 (17.2%, 13.3%), 55 (21.6%, 4.9%), 204 (18.2%)

[7] Abbreviated words (e.g., "Oct." for "October")
20 (2.3%, 1.8%), 11 (4.3%, 1.0%), 31 (2.8%)

[8] Use of Japanese font (e.g., for numbers, use of wide Japanese *zenkaku* spaces instead of slimmer English character spaces)
52 (6.0%, 4.6%), 9 (3.5%, 0.8%), 61 (5.4%)

Mistake totals for this category type are:
282 (32.5%, 25.1%), 91 (35.7%, 8.1%), 373 (33.2%)

Typographical Mistakes

Students made more mistakes of this type than any other.

[9] All caps
110 (12.7%, 9.8%), 4 (1.6%, 0.4%), 114 (10.2%)
[9A] For first name
46 (5.3%, 4.1%), 2 (0.8%, 0.2%), 48 (4.3%)
[9B] For family name
46 (5.3%, 4.1%), 2 (0.8%, 0.2%), 48 (4.3%)
[9C] For day
2 (0.2%, 0.2%), 0 (0%, 0%), 2 (0.2%)
[9D] For month
16 (1.8%, 1.4%), 0 (0%, 0%), 16 (1.4%)

[10] Incorrect caps
90 (10.4%, 8.0%), 18 (7.1%, 1.6%), 108 (9.6%)
[10A] In first name (e.g., "TAro")
27 (3.1%, 2.4%), 1 (0.4%, 0.1%), 28 (2.5%)
[10B] In family name (e.g., "tanaka")
45 (5.2%, 4.0%), 4 (1.6%, 0.4%), 49 (4.4%)
[10C] In day
4 (0.5%, 0.4%), 4 (1.6%, 0.4%), 8 (0.7%)
[10D] In month
11 (1.3%, 1.0%), 9 (3.5%, 0.8%), 20 (1.8%)
[10E] Of ARS
3 (0.3%, 0.3%), 0 (0%, 0%), 3 (0.3%)

[11] Misspelling
26 (3.0%, 2.3%), 39 (15.3%, 3.5%), 65 (5.8%)
[11A] Of first name
11 (1.3%, 1.0%), 0 (0%, 0%), 11 (1.0%)
[11B] Of family name
9 (1.0%, 0.8%), 15 (5.9%, 1.3%), 24 (2.1%)
[11C] Of day
5 (0.6%, 0.4%), 6 (2.4%, 0.5%), 11 (1.0%)
[11D] Of month
1 (0.1%, 0.1%), 18 (7.1%, 1.6%), 19 (1.7%)
[11E] Of ARS
0 (0%, 0%), 0 (0%, 0%), 0 (0%)

[12] Spacing
359 (41.4%, 32.0%), 103 (40.4%, 9.2%), 462 (41.2%)
[12A] No spacing (e.g., "Monday3")
271 (31.3%, 24.2%), 18 (7.1%, 1.6%), 289 (25.8%)
[12B] Extra spacing (e.g., "Monday 3")
88 (10.1%, 7.8%), 85 (33.3%, 7.6%), 173 (15.4%)

Mistake totals for this category type are:
585 (67.5%, 52.1%), 164 (64.3%, 14.6%), 749 (66.8%)

Discussion

With the tallies and calculations presented above, the scale of students' renaming mistakes –

and the reason for conducting the present study – should now be apparent. While to err is human, nearly a quarter of all ARSs received were not renamed properly, *even after students received repeated instructions, reminders, and examples for renaming their files*. While there are patterns evident in the particulars of their mistakes, as revealed above (e.g., that there was a general decrease in incorrectly renamed ARS files between semesters, that the longer fall-semester month names were misspelled more often than their shorter spring-semester counterparts), due to space limitations, the current paper must be restricted to analyzing students' mistakes with respect to the background areas discussed above, as they were all interrelated and had bearing on the research finding interpretations.

Area 1: The Following of Instructions

Since so many file renaming mistakes were made, it appears that these mistakes resulted from students simply not following instructions. Although the relatively infrequent instruction-based mistakes evinced their ability to follow *global* instructions on renaming (i.e., that files must be renamed), the large number of detail-based and typographical mistakes – particularly those made by unrequested character inclusion and incorrect spacing – shows that students were failing to follow the *specific* instructions outlined by the PFRC. Specifically, considering (a) the existence of the Weekly Schedules given to a majority of students and (b) the I/R's reminders included explanations of common student renaming mistakes as well as calls for students to double-check file names for PFRC adherence, it can be surmised that students not following instructions came less from any information processing difficulties, language-based barriers, or working memory problems, but rather, from students failing to engage in the necessary and oft-requested *proofreading* of their typed file names prior to submission.

Proofreading, as both a task and a skill in its own right, is about writers ensuring the accuracy of their written work at the surface/mechanical level rather than at the deeper *editing* level of content and meaning (Pagel & Norstrom, 2011). Considering their many previous years of English study and the short length of ARS file names (i.e., names that did not require students to consider either grammar or cohesiveness), had they simply followed instructions and proofread their work, these Japanese university students should have been able to catch a vast majority of these surface English mistakes.

Area 2: Engaging in Mandatory Remote Learning for the First Time

Being engaged in RTL for the first time in AY2020 might have made the following of instructions a more formidable task than it otherwise might have been. Both the practice of enactment (i.e., having learners act immediately on received information) and the providing of instructions in varied modes (i.e., both verbal and written) have been found to assist students in the following of instructions (Dunham et al., 2020), but the I/R's students were essentially only provided the latter, which is not surprising given the newness of RTL for instructors as well as students (Barron et al., 2021). Because ARS (and other document) submission was to occur *after* lesson time (e.g., after a Zoom session), students could not realistically be expected to rename their files as instructed *at the moment they were reminded to do so* and, relatedly, were unable to get helpful *immediate feedback* about their renaming accuracy (see Kogo, 2018).

Like other instructors, the I/R expected his physically-distanced and novice RTL students to be (or soon become) self-regulated learners (Lubbe et al., 2006), which many clearly were

not. Coupling all these recognized problems with the fact that synchronous digital spaces (e.g., Zoom) were likely insufficient to produce the presence effect (see Guerin, 1986, for a lengthy review on this phenomenon by which human behavior changes when another human is present) means that students were possibly *even more isolated* – and therefore less in a position to actively and accurately follow instructions – during ERT than either they or their instructors consciously realized.

Areas 3 and 4: Using Personal Computers and Typing

It is suspected that not a few students made numerous detail-based and typographical mistakes because they were not familiar with personal computer operation (e.g., the process by which computer users may go about renaming computer files[9]) or with the physical aspects of typing, including keyboarding as well as mouse cursor movement. As explained above, if the participants in this study were typical Japanese university students, then they would have had limited exposure to and practice with personal computers and their associated physical accessories. Were this the case, no one (including the I/R) should have expected them to be even moderate-level typists. Keyboarding is a skill (Donica et al., 2019), and such beginner-level keyboarders would have likely concentrated mostly on *key location* and not *text composition* (van Weerdenberg et al., 2019) when typing. Without engaging in the oft-requested aforementioned proofreading, any typographical errors made would have simply gone unnoticed – and uncorrected.

Additionally, typing in English may have imposed additional and unique challenges, particularly because changing character input method between Japanese and English *must be done manually by the user*. Students failing to change the character input method – or accidentally switching the method from English back to Japanese when typing – would have led to mistakes. Furthermore, many students may have assumed that typed Japanese *zenkaku* spaces are no different from English spaces, which is definitely not the case.

Incidentally, as the ARS was in part a remote student-teacher communication tool, several students used it to explain their difficulties with typing:

- "It took a very long time to finish the homework because I'm not used to typing words in English. But it's good training for me!"
- "It took 3 hours to fill out all the blanks by typing…I need to keep practicing."
- "It is difficult for me to type [in] English."
- "Sorry I'm late. I'm not good at typing. So, today's lesson takes very [sic] long time."

In one instance, a student indicated that their typing skills were so poor that they would rather not type and would take pictures of their documents and submit photos as email attachments:

- "It is difficult for me to type fast, so I will write on paper."

Recommendations

Although this was an admittedly ad hoc study conducted because it was noticed that students were making what appeared to be easily avoidable mistakes for what was originally thought to be a relatively simple task, the results as presented and analyzed above lead to the proffering of both pedagogical and research suggestions.

[9] Several students told the I/R directly via the ARS that they did not know how to use personal computers or how to rename files.

On the pedagogical side, because it appeared that many mistakes were made largely because students failed to double-check their typed work, students should be allowed opportunities to practice and be given feedback on both proofreading and editing. Because of the many calls for consciousness-raising in second and foreign language teaching (Celce-Murcia, 2001; Ellis, 2002), just making students aware of the need and value of proofreading might eliminate unnecessary mistakes, especially those that arise from students' specific difficulties (see O'Brien, 2015).

Also, as ERT has shown us, the younger generation in Japan needs to build up its digital technology competencies. Calls for the need to increase keyboarding competency are not new (Barkaoui, 2014). Because *training* with digital technology is just as important as *access* to and *support* with it (Johnson et al., 2016), students should be required to enroll in and pass keyboarding courses prior to university enrollment. By doing so, students would necessarily be given time to acclimate themselves with personal computers and learn the ways in which personal computers differ from – and in many ways surpass – smartphones in educational spheres (Dhoray, 2020). Lessons and practice typing in both English and Japanese would be recommended.

On the research side, should ERT continue (which it is for a considerable number of university courses in Japan as of this writing) or should educational institutions opt to rely more on remote learning once the pandemic has passed, a call can be made for research that compares how different groups of students follow instructions, for instance, those in classroom-based lessons and those learning online. By doing so, educators could better determine the source of skillset deficiencies extant in the non-compliant students (Gill et al., 2012) and devise pedagogical practices to improve or otherwise mitigate them.

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Study of University Education in COVID-19: Considering Future Lectures Based on Survey Results

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
COVID-19, which is longer than expected, has a great negative impact on our society and life. We are restricted in our actions and many restaurants and businesses are bankrupt. The unemployed are also accelerating. In the field of education as well, various restrictions were imposed, and we had no choice but to change to a method of continuing education with the personal safety of students and faculty members as the top priority. Since face-to-face lectures were common in Japan, education at universities was also restricted, and we had to change to online lectures in a hurry. The faculty are struggling to prepare for online lectures and create teaching materials that they are not accustomed to. Even with the gradual progress of vaccination, the end of COVID-19 has not been expected, and we are in a situation where we have no choice but to continue online lectures. The author's university conducted the questionnaire survey of online lectures from students. The purpose of this survey is to understand the current situation of students at online classes and to improve the next classes more effectively. The survey's implementation period was February 25-March 17, 2021, the target was undergraduate students, and the number of respondents was 5,703 (Ratio of respondents to the survey subjects: 23.2%). In this paper, the author will introduce the results of the survey and will consider how to improve the future education with pandemic based on this survey result.

Keywords: Online Class, Hybrid Class, Face to Face Class, COVID-19, Pandemic

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Introduction

COVID-19 has changed the world dramatically. Nobody imagines the unprecedented pandemic. As the number of infected people still increases and the medical system crisis becomes more serious, the lockdown and many restrictions are strengthened in most countries and regions. As a result, economic activities are severely restricted and have a serious impact on our lives. Even in the field of education, it has a great negative influence. Under such circumstances, most of universities are switching to online classes around the world. About two years have passed since the pandemic has been terrorized the world. Though the vaccination rate is gradually increasing, it has not been effective yet. We have nothing to do with the emergence of new Omicron. Who could have predicted such a protracted negative influence? We have a mission to understand the current situation and issues of education to continue providing education even during such a pandemic.

1.Situation of Class Implementation and Class Type during Pandemic

1-1. Overview of Class Implementation in Japan

According to the survey (Ministry of Education, Culture, Sports, Science and Technology Japan, Survey for Class Implementation Status at Universities during COVID-19, June,2020) which 1,069 universities responded. During pandemic, 1,069 universities did not postpone classes and continued classes (Figure1). As for class type, hybrid is 60.1%, online is 23.8%, and Face to Face is 16.2%(Figure2).

Figure1 Class Implementation Status

Type	Class implementation	Class postpone/ interruption
National University	86 schools (100%)	NIL
Public University	102 schools (100%)	NIL
Private University	824 schools (100%)	NIL
National Institute of Technical College[1]	57 schools (100%)	NIL
Total	1069 schools (100%)	NIL

Source: Ministry of Education, Culture, Sports, Science and Technology Japan, Survey for Class Implementation Status at Universities during COVID-19,2020, https://www.mext.go.jp/content/20200717-mxt_kouhou01-000004520_2.pdf

[1] National Institute of Technical College is a higher education institution that aims to train practical and creative engineers. There are 57 national, public and private schools nationwide, and a total of about 60,000 students are studying for 5 years.

Figure 2 Class Type

Type	Face to Face	Hybrid	Online
National University	1 schools(1.2%)	55 schools(64.0%)	30 schools(34.9%)
Public University	8 schools(7.8%)	72 schools(70.6%)	22 schools(21.6%)
Private University	145 schools(17.6%)	492 schools(59.7%)	187 schools(22.7%)
National Institute of Technical College	19 schools(33.3%)	23 schools(40.4%)	15 schools(26.7%)
Total	173 schools(16.2%)	642 schools(60.1%)	254 schools(23.8%)

Source: Same as Figure1

Japanese education system has mainly focused on face-to-face classes on campus until now. Most of professors and students have never experienced online. We had to prepare for online classes in a short time for this pandemic. Unlike the face-to-face classes, online classes are required new knowledge and skills to provide more effective classes. It is necessary to look back after experiencing online classes for the first time so that we can provide the effective online classes not only for the pandemic but also for the normal times referencing to the evaluations from students. Even with the gradual progress of vaccination, the end of COVID-19 has not been seen with new mutant strains and we are in a situation where we have no choice but to continue hybrid or online classes.

1-2. Class Type and Method for Grade Evaluation at Chuo University

Our university instructed 4 class types during COVID-19.
1) Interactive class: Professors and students are connected via the Internet in real time with audio (Face to Face or Hybrid).
2)Video distributed class: Professors provide a video recording lesson and ask questions or discuss by email or the web educational support system by Chuo provided.
3) Material distributed class: Professors provide lecture's materials (PowerPoint, PDF etc.) and questions and discuss by email or the web educational support system by Chuo provided.
4) Self-study class: Focusing on self-study and exercises using textbooks and others.

Our university instructed 4 specific methods for the grade evaluation during COVID-19. We can choose one of them or mix these methods by ourselves after notifying the students in advance.
1) Final report
2) Normal score including reports and quizzes after each class
3) Online test (60 minutes, and 45 minutes for language class)
4) Other and any combination

2. Result of the Survey of Online Class from Students

Chuo university conducted the survey of online class from students. The survey implementation guidelines are as follows.

-Implementation period: July 24-August 17,2021 for Spring semester 2021
-Purpose: To grasp the situation of students by online class in the spring semester and use the results as a reference for the next semester.
-Target: Undergraduate students
- Total number of answers: 5,703
Ratio of respondents to the survey subjects: 23.2% (13.2% in the previous term)

In this chapter, the author will extract the results that have changed significantly from the previous survey: learning outcome, satisfaction, percentage of participation, advantage and disadvantage.

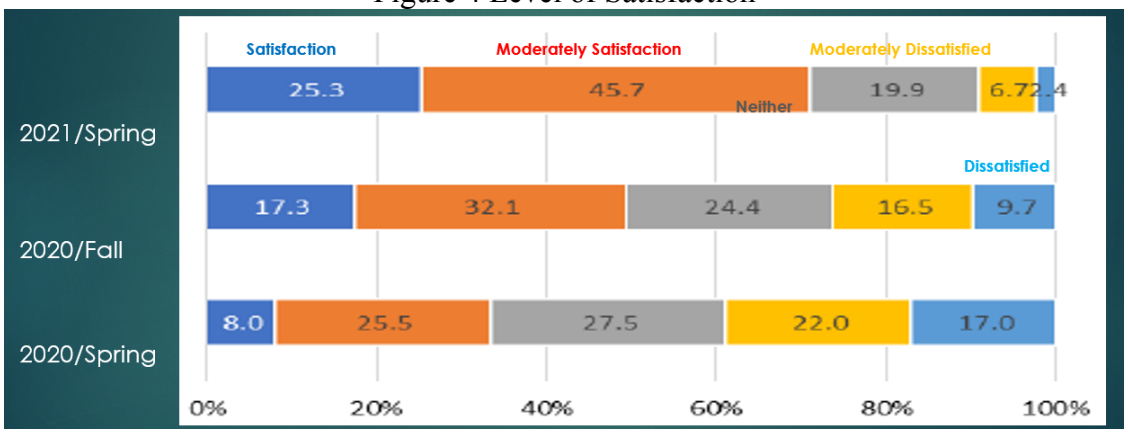
-Learning outcome:
Q. How about the results of your own learning by online or hybrid class?
Learning outcome by online or hybrid class is about10% up from the previous survey (The previous result 47.1% to this survey result 57.3%) (Figure3).

Figure 3 Learning Outcome by Online/Hybrid

Source: Questionnaire Survey about Online Class, Chuo University,2021

-Level of satisfaction:
Q. How satisfied are you with online or hybrid class?
The total answers of “Satisfaction” and “Moderately Satisfaction” are about 15% up.
(33.5% → 49.4%) (Figure 4)

Figure 4 Level of Satisfaction



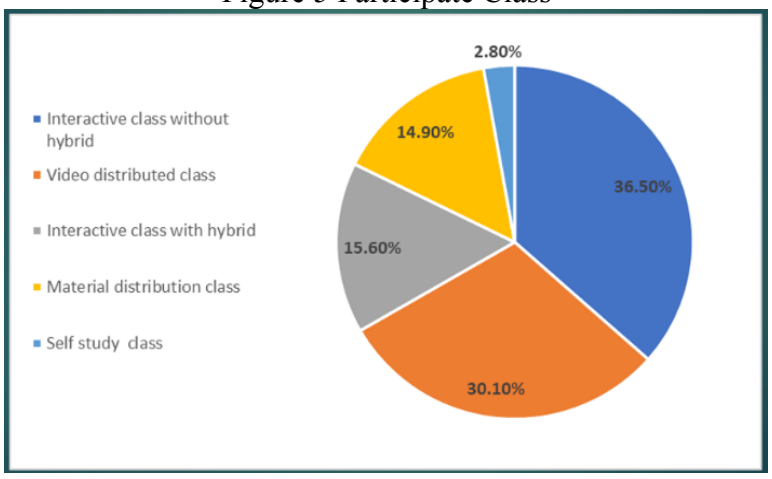
Source: Same as Figure 3

-Participation class:
Q. What class did you participate? (Figure 5)

Interactive class without hybrid:36.50%
Video distributed class:30.10%
Interactive class with hybrid:15.60%
Material distribution class:14.90%

Self study class:2.80%

Figure 5 Participate Class



Source: Same as Figure 3

-Advantages of hybrid class by face-to face class:
Q. What are the advantages of hybrid class by face-to-face class? (multiple answers)
Interaction with students in the classroom:54.9%
Ease of participation in class:45.2%
Interaction with faculty members:42.4%
Interaction with friends before and after class:39.4%

-Advantages of hybrid class by online class:
Q. What are the advantages of hybrid class by online? (multiple answers)
Time effectively:64.5%
Easy to participate:59.5%
Safety:45.6%
Understanding deeply of class content:14.0%

-Disadvantages of hybrid class:
Q. What are the disadvantages of hybrid class by face-to face and online class? (multiple comments)
-The progress of classes has slowed down and become worse.
-Some students had to wait a long time for improving the environment of PCs and solving the problems.
-It was difficult to communicate at the online class.
-Questions are ignored.
-There was a difference in the burden of assignments and experiments between online and face-to-face.

-Most satisfied class during pandemic:
Q. Which class was the most satisfying?
Interactive class without hybrid:36.5%
Video distributed class:30.1%
Interactive class with hybrid:15.6%
Material distribution class:14.9%
Self-study:2.8%

-Desirable class:
Q. What class do you want to join?
The percentage of students who wanted face-to-face class has increased from the previous term, and the other hand, 20% students want all online classes same as the previous.

-Advantage of online class (top 6, multiple choice answers):
Less time burden:85%
Participate at home:70%
Study at own pace:60%
Less financial burden:39%
Less physical burden:38%
Easy to review: 31%

-Disadvantage of online class (top 6, multiple choice answers):
Difficult deepen understanding:41%
Psychological burden:40%
Difficult to ask questions:40%
Difficult to make good environment for studying: 39%
Less opportunity to speak: 36%
Lack of knowledge about equipment and tools:20%

-Disadvantage of online class (comments)
-Feel isolate due to lack of interacting with friends
-Physical pain (eyes, etc.)
-Difficult to ask questions
-Lack of response and feedback from professors
-Many assignments
-Feel long time and lack of concentration

3. Consideration: Issue and how online class should be in preparation for future pandemic

We will point out the issue and consider how online class should be in preparation for future pandemic from the questionnaire survey. The mission of university is to prepare class from anywhere and anytime if students would like to study. There are many students who want face-face-class. On the other hand, online class with hybrid will be expected to become indispensable option in the future even if this pandemic will be over. The positive opinions are received regarding online classes, and the learning outcome and satisfaction are higher than the previous survey results. We suppose that there are a certain number of students who feel the significance of online class. Because the percentage of advantage for online classes increased in all items. On the contrary, regarding the disadvantage, the ratio decreased in all items. These results mean we experienced hybrid class for two years and gradually became more effectively. There are many students who are satisfied the video distributed class. The reason is that they can take it at their convenient day and time and can use time effectively.

The first advantage of the hybrid class by face-to-face class is interaction with students in the classroom. This shows that it is important for students to interact with other students at campus. On the other hand, the first advantage of hybrid class by online is Time. From these results clearly shows that students get the different advantages depending on the location of each class.

Online class often causes a lack of communication. It is possible to set a break time, quiz and chat between professors and students, or between students and students during class. We will take a break time as a place for free interaction. It is possible to provide a place for interaction with other students through Project Based Learning (PBL) in online class. PBL is essential even if the number of students is large in some way. The presence of a facilitator is the key for PBL. Facilitators, unlike ordinary moderators are required to have the ability to understand students' opinions and organize them in an easy-to-understand for group members. As we need to find this facilitator among the students, so the first group work will be to work in roster order or in any group from the work or the report to be submitted by students, we will select a facilitator for each group at a next grouping. When targeting a large number of students, communication will be insufficient. As a small-group class actively can incorporates hybrid class, there is a great merit taking PBL at face-to-face class. It is also useful for making relationships between students, so it may be worthwhile to actively incorporate hybrid class, especially for freshmen.

It is important for online class to take full advantage of the Internet. Online class is not passive one. The key is to incorporate what can be done on the Internet into class. Online class can be provided online company tours, online social tours, guest speakers from all over the world, and interact with overseas students which are not possible by face-to-face class. As for improving the environment for attendance, it is required to confirm the internet environment of all students. In case of connection trouble, the manual and the Information and Communication Center at universities should response promptly at any time. It may also be necessary to record a class for students who cannot connect.

Some students point as one of disadvantages that there are too many assignments at online class. The assignment should be positioned as the degree of understanding of the lecture that does not burden the students. At the beginning of class, it will be essential to review the previous class and set a question time before the end of class.

Let's consider the effects of online class. At first, the author will introduce an overview of Japanese working format. Until now, most of Japanese companies have worked by only face-to-face. Telework has made an appearance in the1980s in Japan, however Telework was not a popular working style before this pandemic. Face to face communication is highly valued in Japanese culture, thus working in the office with colleagues is regarded as the best working format and environment. But we were forced to work by Telework in this pandemic.

We did not have a sense of crisis about pandemics and did not assume a response to it. Most of Japanese universities have similarly neglected to take measures against pandemic. Until now, most of Japanese universities have only provided face-to-face class. However, after encountering this pandemic, we have to reconsider university class format and our working format. Online class will be the first step and good opportunity to learn how to work by telework after graduation. The spread of online class also leads to the spread of Telework in Japanese society.

4.Conclusion

While we can't see the end of this pandemic, university education needs to provide more diverse learning. Various promotion and issues have been revealed from the survey results. The promotion of hybrid class and method will maximize the advantage of the Internet. Even after the end of this pandemic, we suppose online with hybrid class can be one of the useful

class formats in order to prepare for not only future pandemic but also for Japanese society. Unfortunately, the author is very disappointed that most of Japanese universities are going to revert from online class to previous face-to-face class. If company has never experienced Telework, it can't do successful by telework at emergency as pandemic and other natural disaster. This is the same as class format. It is necessary to prepare a system that can continue class no matter what happens at any time by providing hybrid class from normal time. Continuing mutual coexistence between face-to-face class and hybrid class which students and professors can choose by themselves will be required for any future pandemic and society.

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Awakened Schools: A Theoretical Framework for Engaging Students' Interconnectedness

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Much research has been done around the implementation and benefits of social and emotional learning. In spite of this good research, the field of SEL lacks a theoretical, rather than outcomes-based, grounding, in particular in ways that extend beyond curriculum-based approaches (Weissberg et al., 2013). There have been calls from within the field of SEL to go deeper into the inner life of children (Lantieri, 2002, 2019). This paper proposes a conceptual framework for this deeper form of whole child education by building on Shulman's (1986; 1987) pedagogical content knowledge (PCK) to understand how teachers create awakened classrooms. Awakened classrooms support students' cognitive development in ways which allow students to use enhanced perception, engage in multiple perspective-taking, and foster discernment (Miller, 2015; 2021). We use the term *spirituality* as a shorthand for accessing these parts of the brain: spirituality is the innate human capacity to feel interconnected with others and the greater world, rather than any particular beliefs or practices. Based on three years of research which examined how teachers created awakened classrooms (Chapman et al., 2021; Chapman et al., in press), we created a professional development program to design awakened classrooms. Nurturing innate spirituality in the classroom requires the development of a complex, situated form of knowledge that we call Spiritual Pedagogical Content Knowledge (SPCK). This presentation will share this conceptual framework, which aims to understand the complexity and interplay of the three components of an awakened classroom: spirituality, pedagogy, and content.

Keywords: Spirituality, School Culture, Pedagogy, Pedagogical Content Knowledge, K-12 Education

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Introduction

There is enormous energy in the United States surrounding whole child education. While whole child education encompasses a variety of approaches, such as holistic education, peace education and moral education, two of the most prominent are social and emotional learning (SEL) and character education. Both SEL and character education aim to provide programmatic or curricular support for teachers, parents, counselors, and other educators to teach students emotional and behavioral regulation (Berkowitz et al., 2012; CASEL, 2003; McGrath, 2018). Through Social and Emotional Learning (SEL) curricula, individuals learn to understand and manage emotions, set and attain positive goals, experience and express empathy for others, create and sustain positive relationships, and make sound decisions (CASEL, 2003). Character education aims to cultivate psychological characteristics in students that inspire and empower them to act in democratic, ethical, productive, and socially effective ways (Berkowitz et al., 2012; McGrath, 2018). These programs have found some success in increasing prosocial behaviors while decreasing problematic ones.

Both SEL and character education focus on behavioral change through specific instruction. In spite of the inspired work of these programs, this focus on curricular and programmatic approaches to whole child education has prompted even some leaders of the social emotional learning movement to recognize the limitations of this approach (Weissberg et al., 2013). Consequently, there has been a call within the field to take the social emotional learning and character education movements to a deeper level (Lantieri, 2002, 2019). Concurrently, children and adolescents face unprecedented rates of anxiety, depression, and substance abuse (Mojtabai et al., 2016; Lewinsohn et al., 2004). Given these epidemic levels of pathology, it is imperative to understand what might mediate them. Research has shown that having a strong spirituality is one aspect of mediating suffering. Young people who report having a high personal spirituality also show better psychosocial outcomes (Barkin et al., 2015). Having a thriving spiritual life fortified these students against depression, anxiety, and substance abuse. However, only a small percentage of the students in the study reported having that strong spirituality. The findings on the benefits of spirituality and these calls to take SEL deeper prompted us to consider how the science of spirituality might be applied to K-12 education.

The Science of Spirituality

Spirituality is a deep, innate human capacity through which we experience the sacred and the transcendent in the imminent (Kendler et al., 1997, 1999), which burgeons across the lifespan, including in adolescence (Button et al., 2011; Koenig et al., 2008). When we speak of spirituality, we do not speak of any faith or religious tradition, or any particular spiritual practices. Rather, we speak of an augmented sense of awareness through which we have enhanced perception and feel connected to others and a benevolent universe (Miller, 2021). Neuroscience has identified four regions of the brain which are our innate spiritual seat of perception (Miller, 2021). In a study in which participants were asked to describe spiritual experiences while undergoing fMRI (functional magnetic resonance imaging) scans, increased activity and connectivity was shown in the regions of the brain (the Occipital, Parietal, and Precuneus regions and the Ventral Frontal Temporal Network) which activate the bonding network, control perception, heighten perspective-taking, feel connection with others, and engage in discernment (McClintock et al., 2019; Miller et al., 2019). From a scientific standpoint, spirituality is when these regions of the brain work in tandem, allowing us to have an awakened sense of awareness.

Supporting this neuroscience, studies of twins have shown that every child is born with an innate capacity for spiritual life (Kendler et al., 1997; Koenig et al., 2008; Button et al., 2011). Further, these same studies have shown that our innate capacity for spirituality is one-third heritable, while two-thirds of our spirituality must be socialized (Kendler et al., 1997; Koenig et al., 2008; Button et al., 2011). In other words, although each of us is born with the innate capacity for spirituality, in order for it to fully develop, we must practice using our spiritual brains with others.

Research has also suggested that spirituality is supportive of mental health and overall thriving. Clinical science has shown spirituality to be the most robust protective factor against suicide currently known to medical science (Miller, 2021). Students who report higher levels of spirituality can better cope with life's stressors and have a more positive perspective of their problems (Gnanaprakash, 2013). Further research has shown that spirituality is a protective factor against depression, anxiety, risk-taking behavior, and substance abuse (Barkin et al., 2015; Bonelli et al., 2012). Taken together, these findings indicate that it is imperative to cultivate children's innate spirituality, and also to examine how spirituality supports children's learning.

Applying the Science of Spirituality to K-12 Education

Because spirituality is both inherited and needs to blossom in community, it must be nurtured. Historically, this has been done in faith communities, families, and sometimes in civic communities, but increasingly this is no longer true (Smith & Denton, 2009). Schools are environments which are accustomed to supporting young people's development, and so we undertook to examine how schools were already supporting students' innate spirituality. Thus, through our research, we set out to better understand what schools do to support students' innate spirituality.

We conducted a three-year ethnographic study in 20 schools throughout the U.S. The schools in our study were previously identified as spiritually supportive. Schools varied, and included 14 private schools and 6 public schools. The sample of schools was diverse: secular and religious schools; schools which were in urban, suburban, and rural areas; some were large, some were small; some were well resourced, and some were poorly resourced. Members of our research team conducted in-depth visits to each of the schools in our sample. These visits included observations in formal and informal learning spaces, interviewed school leadership, faculty, staff, students, parents, and in some cases, alumni. Each school provided us with documents (such as their handbook or mission statement) as well as examples of how they saw themselves supporting students' spirituality.

We applied a grounded theory approach to coding our data (Charmaz, 2008), which allowed us to broadly and deeply explore what schools shared with us. We found that schools support students' innate spirituality through their intentionally designed school culture. Schools created the environment in which students' innate spirituality could flourish: one which activated their *awakened brain*. More specifically, we found that schools did this in 11 specific ways; we call these the 11 drivers (or elements) of a spiritually supportive, or *awakened*, school culture. These drivers are centered around *transformative relationships*, which provides the lens through which the other 11 drivers work. Transformative relationships are student-teacher relationships grounded in connection and love, where each person sees the other as a whole human being.

These drivers of an Awakened School, which intentionally create a school culture which supports students' spiritual development, are: authentic core; transcendent practice; integrated mission, aspirational values; inherent worth; ritual; intentional lexicon; authorized keeper; nature consciousness; and meaningful learning. The *Authentic Core* recognizes that schools support each child's innate spirituality and create ways in which they can engage their spirituality in school. This is supported by *Transcendent Practice*, which are the pedagogical and spiritual approaches through which schools invite students to use their *awakened brain*. Awakened Schools also did this by promoting *Nature Consciousness*, a manner of teaching through which students created deep relationships with the natural world. The schools in our study also engaged in *Meaningful Learning*: teachers made intentional connections between learning content and service to the wider community. Awakened Schools know the *Inherent Worth* of each person in their community; each student and teacher is seen, known, and valued for who they are. Schools also support students' spirituality through *ritual*, regular practices which bring the school community together to build identity and connectedness; and through an *intentional lexicon*, which is a common language through which everyone in the school community can speak about their spiritual lives and experiences. Schools also have an *Integrated Mission*, where each member of the school community knows and is formed by the school's mission, and *Aspirational Values*, where the goals schools have for students seek the highest good for students both in and outside of school. Each school also had a person, the *Authorized Keeper*, whose role it was to help everyone in the school to foreground decisions in the school's mission. Together, these drivers illuminated how Awakened Schools cultivate students' spirituality. (For a more thorough description of the 11 drivers of an Awakened school culture, see Chapman, Foley, Halliday, et al., 2021 and Chapman, Foley, Barth, et al., in press).

This research provided a blueprint for how any school could transform their culture to be spiritually supportive. We have now taken these 11 drivers of a spiritually supportive school culture and adapted them into a year-long professional development course for educators. This course, *The Awakened Schools Institute*, provides teachers, administrators, and teacher educators with an understanding of the science of a spiritually supportive school culture, access to teachers and educational leaders who have created spiritually supportive school environments, and practices which can be adapted and employed in any school. Given the early success of this program, we seek now to explore how teachers incorporate spirituality into their teaching from a theoretical perspective.

A Theoretical Understanding of Spirituality in Education

Teaching is a complex enterprise: it requires educators to employ multiple forms of knowing concurrently (Mishra et al., 1996; Spiro & Jehng, 1990). Moreover, classroom teaching occurs in dynamic contexts which require teachers to integrate these various forms of knowledge flexibly (Koehler et al., 2013). At a minimum, teachers must understand their students, the content, and pedagogical approaches and know how to integrate those three types of knowledge in ways which make the sum of learning greater than its component knowledge parts (Koehler et al., 2013; Shulman, 1986, 1987).

In the 1980s, when what teachers taught – the content – and how they taught – the pedagogy – were often seen as siloed, Lee Shulman proposed the theory of Pedagogical Content Knowledge, or PCK (Shulman, 1986; Shulman, 1987). Shulman argued that not only were subject matter and teaching methods not mutually exclusive, but that they were in fact deeply interrelated (Shulman, 1986). Further, content and pedagogical knowledge together were

greater than the sum of their parts: together they represent the way in which a teacher must think about their subject matter, think about their teaching methods, and put them into dialogue with each other in such a way so as to transform content and create lessons which are accessible and meaningful for students.

Here, we apply Shulman's PCK framework to the ways in which teachers integrate spirituality into their teaching. While there have been critiques of this theory, it has also been further applied to additional components of teaching. Perhaps the most recent and notable iteration of this was that Shulman's PCK theory served as the basis for considering teachers' integration of technology into their teaching, through a framework commonly known as TPACK (Koehler et al., 2013; Mishra & Koehler, 2006).

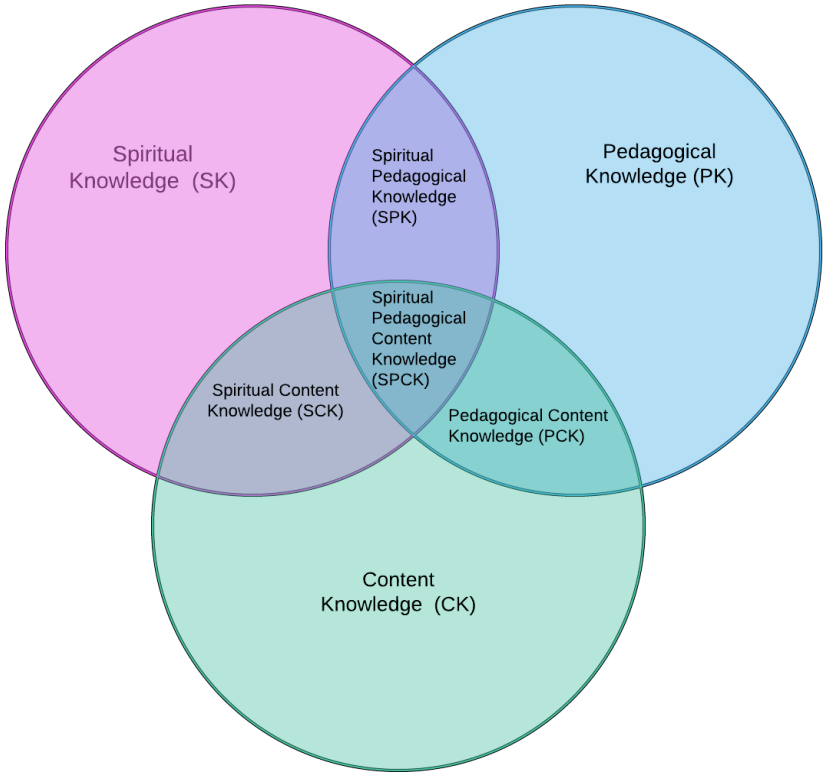

Figure 1: Diagram of Relationships of Spiritual Knowledge, Pedagogical Knowledge, and Content Knowledge

SPCK: Spiritual Pedagogical Content Knowledge

Although spirituality is an innate human capacity (Kendler et al., 1997; Koenig et al., 2008), spiritual knowledge is a complex and specialized form of knowledge. In order to develop a theoretical understanding of how teachers incorporate spirituality into education, we have applied Shulman's PCK framework. Examining spirituality through the lens of the PCK framework allows us to consider how teachers incorporate students' spirituality into their teaching, which I am calling Spiritual Pedagogical Content Knowledge, or SPCK. This application is appropriate because teaching is a complex skill which relies on interrelated, organized systems of knowledge. Shulman argued that both pedagogical knowledge and content knowledge were systems of knowledge (Glaser, 1984; Mishra & Koehler, 2006; Putnam & Borko, 2000; Shulman, 1986, 1987); I argue here that knowing how to incorporate

spirituality into a school environment is likewise an organized system of knowledge, which extends beyond pedagogy or content, but often intersects with one or both of these.

Spiritual Knowledge

Spiritual Knowledge is the deep knowledge of spirituality and how they support students' innate spirituality. Spiritual knowledge includes a teacher's own spirituality, and how they engage and nurture it in themselves; part of spiritual teaching is that it is anchored by the teacher's own spirituality. Spiritual knowledge further includes knowledge about the science of spirituality and how and why it should be encouraged in children and adolescents. It also includes the knowledge of specific spiritual practices, and the ability to adapt them for different learners. A teacher with deep spiritual knowledge will understand the importance and rationale of supporting students' innate spirituality, and they will know how to create spiritual experiences which do so.

Spiritual Pedagogical Knowledge

Spiritual Pedagogical Knowledge refers to the ways in which spiritual knowledge and pedagogical knowledge are deeply interconnected. This includes the knowledge of how to engage in spiritual practices and when and why certain spiritual practices might be the most supportive or nurturing. Additionally, teachers must feel comfortable and competent in designing or creating spiritual experiences for students. Examples from our data which show Spiritual Pedagogical Knowledge are the use of rituals in schools. While all schools have rituals – a bell schedule, lunch routines, etc. – schools in our sample created rituals to focus and celebrate the students' and communities' interconnectedness. Some religious schools engaged in rituals within their faith traditions, but created space within those rituals so that students could lead them or share reflections on their own spirituality. Secular schools also engaged in rituals, an excellent example being a school which held a sacred fire twice a year, where the school and surrounding community came together to share stories or sit in silence, to reflect and revere the community. In times of trauma and celebration, the school would also light a sacred fire to provide people with a ritual which was familiar in which to process those experiences.

Spiritual Content Knowledge

Spiritual Content Knowledge represents the idea of what spiritual practices support content, or how content can be shared in ways which access our spiritual brains. This includes the ways in which spirituality supports students' learning, belonging, and interconnectedness in schools. Two examples from our data of spiritual content knowledge were that schools in our sample each had an intentional lexicon, a common language with which everyone in the school community spoke about their inner life and outer connections. The learning and practice of this language to talk about spiritual life is a type of content knowledge. Another example is the way schools in our sample taught about the natural world. In talking about nature, teachers in our study spoke about nature with wonder, awe, and reverence; this was mirrored in the ways in which the students we interviewed talked about nature. Teachers also had a certain approach to content about the natural world, which was to situate human beings as being commingled, interconnected, and a part of nature. Human beings were neither masters nor stewards of nature; rather, we are deeply intertwined.

Spiritual Pedagogical Content Knowledge

Spiritual Pedagogical Content Knowledge is the basis of good teaching which is grounded in spirituality. It goes beyond the deep knowledge required for the teaching of content, the informed choice or pedagogy, or the ways in which a teacher supports students' spirituality. Spiritual Pedagogical Content Knowledge requires an understanding of how students make sense of their inner life – existential questions, wonder, curiosity, a sense of connection to something beyond themselves; knowledge of the importance of spirituality in the overall development of children; pedagogical approaches which can be used to support students' engagement with their awakened brains; awareness of where students are in their spiritual development; and an understanding what content or pedagogy makes it easier or more difficult to access those parts of the brain; and pulling all three knowledges together to deepen and strengthen the awakened brain. One example from the schools in our study was their use of transcendent practices, experiences which were specifically designed to activate students' spirituality and foster their connection with the wider world. In some schools, this took the form of art, such as a school which invited students to engage in mindful drumming circles. In other schools, there was a daily practice of the entire school taking 5-10 minutes to be in silence together. Other schools designed experiences in nature, whether walks around campus or field trips to national parks, where students were given prompts for reflection and time to be on their own in nature. In each case, the spiritual practice – making music, being in silence, being in nature – incorporated content and pedagogy – making music, prayer or meditation, noticing nature, reflection through prompts. This deep type of knowledge – of how to support the spiritual lives of children and adolescents – is not the purview of spiritual masters, subject matter experts, or pedagogical specialists. Rather, it is an integrated form of knowledge in which a teacher considers and weaves together spiritual, pedagogical, and content knowledge.

Implications

Despite great gains by whole-child education movements in increasing academic achievement and prosocial behaviors, children and adolescents continue to suffer from high rates of anxiety, depression, and substance abuse (Mojtabai et al., 2016; Lewinsohn et al., 2004). Having a strong spirituality has been shown to provide a protective benefit against anxiety, depression, risk-taking, and substance abuse, but few young people report having a strong spirituality (Barkin et al., 2015). Contexts which have traditionally cultivated young people's innate spirituality are experiencing lower rates of participation (Smith & Denton, 2009), and other potential sources of spiritual nurturing feel ill-equipped to do so (Chapman & Miller, in press). Given the national crisis of suffering and the research demonstrating the mediating effects of spirituality on that suffering, it is critical that we help all students to develop a strong spirituality. Social emotional learning (SEL) and other whole child fields have called for education to move beyond the teaching of prosocial skills to nurture each child's inner life (Lantieri, 2002, 2019). Schools provide a natural and logical place to do so, as environments in which students' development in other areas is already supported and nurtured.

We know from our work at The Collaborative for Spirituality in Education, and through our *Awakened Schools Institute*, that teachers and schools need support in nurturing students' spirituality in the classroom. Undoubtedly part of this work must be understanding the knowledge which is required of teachers to nurture students' spirituality, and particularly how that knowledge intersects with teachers' deep understanding of subject matter and teaching

approaches. Developing a theoretical understanding of how this work of cultivating spirituality through K-12 education will support teachers, teacher educators, and pre-service teachers in developing lessons and experiences which intentionally and successfully integrate spiritual knowledge, pedagogical knowledge, and content knowledge.

Conclusion

Students are experiencing unprecedented levels of suffering; mental health outcomes are as low as they have ever been, and students are experiencing high levels of disconnection and loneliness (Mojtabai et al., 2016; Lewinsohn et al., 2004). We know that spirituality, or accessing the awakened brain, supports positive psychosocial outcomes and overall wellbeing, but traditional means of cultivating young people's spiritual development are waning (Smith & Denton, 2009). Addressing this gap in how spirituality is supported for children and adolescents is therefore important. At the same time, whole child education fields are calling for whole child education to go deeper to the inner core of the child. Thus, it is important that schools support students' spirituality. At the same time, teachers need support in integrating spirituality into education. In order to offer this support, we must understand how teachers can and do support students' innate spirituality. This article presented a theoretical understanding of how teachers incorporate spirituality into their teaching: *Spiritual Pedagogical Content Knowledge*. Understanding how teachers can support students' innate spirituality – and supporting them as they do so – is an imperative of our time.

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The Development of Leaders: Being, Knowing, and Doing Leading Through Self Mastery

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The study of leadership must include the question "how are leaders made?". Researchers agree that to develop as a leader requires three dimensions: Knowing, Doing, and Being. Together, these three dimensions enable a leader to bring the Self and their abilities into the group interactions and organizational success. Therefore, all three need to be acknowledged for their role individually in leader development. The common theme in this research is that leaders are made or developed over a period of time. However, there is a divide in how much weight is given to each dimension: knowing, doing, or being a leader. Knowing includes the various aspects of intelligence and reflection in being aware of one's surroundings and social interactions. Doing consists of problem-solving, managing conflict, and utilizing adaptive skills. Being highlights the development of self-concept, identity, and an individual's transformational abilities. Knowing and Doing are about a process where the leader's actions are amid their leading phase, and Being is about identity development and one's self-concept and self-mastery. This paper argues that although all three dimensions of leader development are essential; Being is the most critical dimension of leader development. The author reviews five research articles and, through discussion, shows that the Being dimension is the first and most important to develop as a leader. The author concludes with a call for future leadership development research on self-mastery and investment in creating the self-concept of leader development.

Keywords: Leadership Development, Transformation, Reflection Process, Adaptability to Change, Leadership Education, Reflect, Adaptive Leadership, Contingency, Self-Mastery

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Introduction

The study of leadership must include the question "how are leaders made?". A common theme in leadership research is that leaders are made or developed over a period of time. However, there is a divide in how much weight is given to each dimension: knowing, doing, or being a leader (Nohria and Khurana, 2010, p.20-24). Researchers attempt to answer the question, "what makes a good leader?" based on the lens of their own discipline. However, the researchers have divided perspectives on what is important. Some argue that specific personal attributes make one a leader, while others assert that a leader performs a particular set of social functions or maintains a role in the system of social relations (Nohria and Khurana, 2010, p.16). This paper argues that although all three dimensions of leader development, namely: knowing, doing, and being, are essential, Being is the most vital dimension of leader development. Before a leader can know or do, the leader needs to recognize that being selected to lead is a responsibility to followers and the organization, and to lead effectively; the leader must know their self-concept identity and be a willing participant in the journey towards self-growth and transformation (Ibarra, Snook, and Ramo, 2010; Avolio, 2010; Kegan and Lahey, 2010).

Self-mastery is the essence of Being. According to Lata (2021), "Self is the I, me, myself. Mastery is a deep understanding of my needs, desires, addictions, neuroses, and the ability or wisdom to discern the choices that allow us to maintain self-control through self-regulation on our tendencies." Regardless of the discipline or industry, the being or self-mastery dimension of leadership is a set of behaviors, attitudes, core values, and mental models that sets one apart from followers. Therefore, leadership education programs need to focus on the tools and techniques that cultivate the essence of being a leader.

Although different researchers give being, knowing, and doing different weights, all three are needed for leader development. Together, these three dimensions enable a leader to bring the Self and their abilities into the group interactions and organizational success. Therefore, all three need to be acknowledged for the role they play individually in leader development. Knowing includes the various aspects of intelligence and reflection in being aware of one's surroundings and social interactions (Conger, 2010; McCall, 2010; Kegan et al., 2010). Doing includes the ability to problem solve, manage conflict, and utilize adaptive skills (McCall, 2010; Avolio, 2010; Kegan et al., 2010). Finally, Being highlights the development of self-concept, identity, and an individual's transformational abilities (Nohria et al., 2010; Ibarra et al., 2010).

Literature Review

Nohria et al. (2010) discuss that a leader is developed through the paradigm of knowing, doing, and being there is a divide between the researchers who focus on knowing and doing together (McCall, 2010; Conger, 2010) while the being aspect is generally isolated (Nohria et al., 2010, Ibarra et al., 2010; Avolio, 2010; Kegan et al., 2010). Knowing and doing are about a process where the leader's actions are amid their leading phase, and being is about identity development and one's self-concept and self-mastery.

Being Dimension

Based on their upbringing, some people may see themselves as leaders and guides from an early age. However, irrespective of upbringing, a desire to learn what it truly means to be a

leader and an interest in reflecting on self-concept are equally crucial in leader development (Ibarra et al., 2010). While some have the desire to lead, some want to understand the Self as a leader. To that end, formal leadership education can allow not only to "clarify the leadership roles and responsibilities to advance [but also to] address derailing behaviors" (Conger, 2010, p.710). This means that formally studying the self-concept of being a leader can assist an individual in areas of self-confidence and identity development which will be essential in leading followers and organizations.

Historically, anyone successful in one situation was placed in another challenging position to observe if the individual flounders or succeeds. The former was the end of the career, while the latter meant a much more difficult situation awaited (Conger, 2010). Today there is enough evidence that true expertise requires more than a decade of learning and development; and the realization that leading is about interdependence (Conger 2010; Kegan et al., 2010). To begin somewhere, however, requires introspection; as Kouzes et al. (1987) state, "To truly develop as being a leader requires 'figuring your own voice'" (quoted in Conger, 2010, p.714).

Being a leader involves authenticity and the ability to make meaning of the various associations, relationships, and ideas of the future Self (Ibarra et al., 2010; Avolio, 2010). Thinking about the Self requires an internal compass and a self-authoring mind, in the words of Kegan et al. (2010). A self-authoring mind involves one's ability to reflect, adapt, and transform into the image one holds of oneself. As Markus and Nurius (1986) explain, "an important component of the self-concept is a person's possible selves- the image an individual has about who he or she might become, would like to become, or fears becoming in the future" (quoted in Ibarra et al., 2010, p.659).

To be a leader, therefore, first and foremost, requires an image of what one sees as an essential aspect of leadership and the ability to see his or her future self in that role (Ibarra et al., 2010). Conger (2010) argues that individual development requires investment such as leadership vision, communication, role-modeling behavior, and motivational empowerment approaches to enable the individual to begin to think of oneself as a leader. This is because prior to acting as a leader, one needs to feel like a leader. When one thinks like a leader, they can recognize and reflect on what a good versus an ineffective leader looks like (Avolio, 2010) and what is expected from them in a leadership role; in other words, knowing the expectations that come with the position. Knowing involves a leader's intellectual ability and rational, pragmatic, and circumstantial acumen (Nohria et al., 2010). It consists of the leader's ability to use emotional intelligence for social awareness.

Knowing Dimension

Between being and knowing is a transition space that Ibarra et al., 2010 call the liminal state. The liminal state is where the idea of who one is and what one wants to become is in flux. In this liminal space, formal education and support from mentors and coaches come into play so that a leader can use help for their vision and learn from others' experiences. It is in this space that the leader development transitions from being only an idea, a belief, and concept, to becoming a part of identity, where the leader can use the formal education, training, and vision of future Self and translate it into practice by following the lead of a support system of people in their life (Becker, 1953, quoted in Ibarra et al., 2010).

McCall (2010) says, "The fact is that no book, consultant, class, or series of classes, including an MBA, can teach anyone how to lead even a small team, let alone a big organization. It is a craft you can learn only through experience" (p.679). This means that education about leading alone is not enough. The experience is what teaches a leader to be situationally adaptive, and knowing is that liminal space. This is the stage where the leader is in the self-authoring mind, a place where the leader is learning to lead.

Historically, experience alone was the antidote to leadership challenges (Conger, 2010). Still, today research shows that competency cannot replace the wisdom and knowledge sharing between coaches and mentors and a leader's development (Avolio, 2010). While it is understandable that not all experienced leaders will have the desire to aid in the growth and experience of a new leader, it truly is one of the most critical steps of a leadership dimension, from being and knowing to doing the act of making another leader. As Follett (1924) states, "Leadership is not defined by the exercise of power but by the capacity to increase the sense of power among those led. The most essential work of the leader is to create more leaders" (quoted in Avolio, 2010, p.741).

Doing Dimension

Most of the research about doing is paired with knowing. Therefore, it is pertinent to examine doing on its own to contrast it with the other two dimensions. When an individual has had the inner reflection and learned how to be a leader and can recognize circumstances that call for situationally adaptive skills gained through experience, it is then the leader can be a transformed agent of change not just for him or herself but for the other leaders coming down the pike (Ibarra et al., 2010; McCall, 2010; Avolio, 2010). As Kegan et al. (2010) state, "What will distinguish your leadership from others' in the years ahead? We believe it will be your ability to develop yourself, your people, and your teams" (p.770). This means that true doing is what Kegan et al. (2010) call the self-transforming mind (p.774). This is where the leader is developing other leaders.

Discussion

Now that we have discussed the literature and seen how Being, Knowing, and Doing weave throughout the different research articles, next the author shows that being a leader plays a pertinent role in leadership development for a leader to lead successfully, and why Being is the most critical dimension of leader development. Per Lata (2021), "How often have we seen our leaders' lack of self-mastery impact our lives? Whether you are leading a country, team, family, or Self, your ability to understand yourself and your triggers mean you can live with mindfulness, knowing that your actions impact others' lives, whether directly or indirectly." Please think of the Being dimension as a foundation or a platform (see figure 1), where the leader, as a person, carries, with him or herself, every learned behavior, identity, and past traumas or techniques to garner a response from others. This is also where the leader is doing the self-work through education, counseling, coaching, mentoring, etcetera, to break away from identities, and derailing behavior patterns that are not letting the leader, as an individual, realize their dream or vision of the future Self (Ibarra et al., 2010; Kegan et al., 2010).

Kegan et al., 2010, call being the beginning stage in adult development as the socialized mind, where the leader as an individual is shaped by his or her personal environment and acts and reacts to the environment from how the leader thinks others perceive him or her. Through self-work and time investment in educational programs and coaching, the leader then

transitions to the next level on the plateau, the self-authoring mind, which is also called knowing (Kegan et al., 2010).

The self-authoring mind or knowing is where the leader starts seeing the bigger picture and connecting the theoretical learnings to the experiences of tenured leaders. This process in adult development is where an individual begins taking responsibility for how he or she engages with their surroundings instead of permitting others to dictate how their actions will influence the leader's response (Ibarra et al., 2010, McCall, 2010; Avolio, 2010; Kegan et al., 2010).

When the leader, as an individual, makes the discernment to follow one's intuition peppered with guidance from experienced leaders (if such support is available to one), the leader then starts to feel and act like they are transitioning into the knowing dimension (McCall, 2010; Kegan et al., 2010). The knowing dimension is a transitional space. It is up to the leader to continue to inhabit this space by continuing the journey of self-growth and learning from others' experiences. Otherwise, the technological and strategic advances in leadership and management will hold the leader behind if they do not grow with time (Keegan et al., 2010; Conger, 2010). Staying in the knowing space leads to true doing, which can take years to develop (Ibarra et al., 2010; McCall, 2010, Avolio, 2010, Kegan et al., 2010).

The true dimension of doing is when a developed leader can start coaching, mentoring, and developing new leaders with their experience (Kegan et al., 2010). The doing dimension is where the developed leader is genuinely someone who knows that they do not know everything and is willing to learn from others, yet stays true to the internal moral compass and is not swayed by others' perceptions (Ibarra et al., 2010, Avolio, 2010; Kegan et al., 2010). This shows that Being is the foundation of actual Doing.

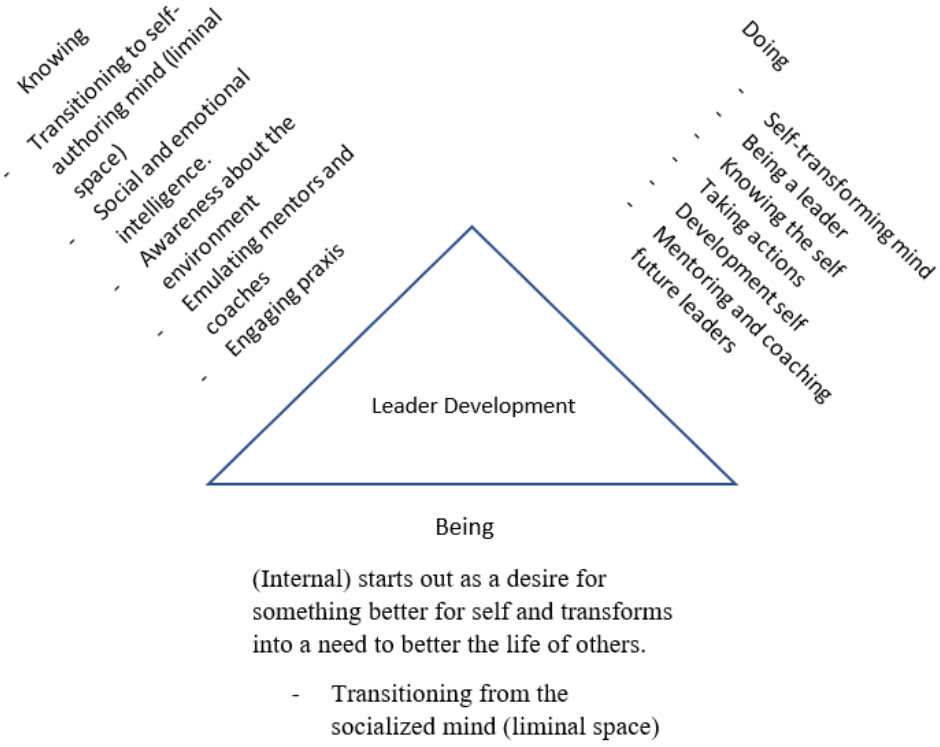
Conclusion

In this paper, the author discussed the three dimensions of leadership development: Being, Knowing, and Doing. The author argued that although all three dimensions are essential for leader development, the least addressed dimension, Being, is the most important. The author reviewed five research articles and, through discussion, showed that the Being dimension is the first and most essential to develop self-mastery. Therefore, future leadership development research should invest time in understanding and developing the self-concept of being a leader.

Leadership education needs to embark on a journey of self-mastery because without it, we see leaders disconnected from themselves with responsibilities to lead others deprived of the proper education and plan to manage both the private and public spheres. Perhaps, then, we will have more self-aware leaders running organizations who are able to self-reflect, self-regulate, adapt, and transform themselves, their followers, and the organizations they lead.

Appendix

Fig. 1



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Vocabulary in Japanese EFL Textbooks: A Bidirectional Coverage Analysis

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Textbooks developed based on the new Course of Study Guidelines have been in use since April 2021. One notable change can be seen in the increase of the variety of vocabulary words, from 1,200 words to between 1,600–1,800 words, that learners need to be familiar with before they graduate junior high school. In this study, vocabulary taught in these newly published textbooks designed for junior high school students in Japan will be assessed. For this purpose, a corpus of junior high school textbooks, which is sourced from one series of government-approved junior high school textbooks, is compared with the New General Service List (NGSL) that consists of 2,801 high-frequency words in general English. Results show that the textbook series is largely composed of vocabulary words contained in the NGSL with a greater than 95% coverage; however, it represents only a small part of the list with a smaller than 37% coverage. Additionally, breaking the NGSL down into 560-word frequency bands, the study investigates in which bands the textbook series focus and in which bands there is a deficiency. This distribution analysis indicates that words at higher frequency bands occur more frequently. The textbook series covers the first 560-word frequency band with a greater than 80% coverage, but the coverage levels sharply decrease after this band. Finally, pedagogical implications are suggested for textbook designers as well as for language learners.

Keywords: Coverage Analysis, Japanese EFL Textbooks, New General Service List, Textbook Corpus, Vocabulary

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Introduction

Last year, the previous Course of Study Guidelines for junior high schools came to an end after 11 years. From April 2021, the new Course of Study Guidelines has been implemented (Ministry of Education, Culture, Sports, Science and Technology [MEXT], 2017a). With the implementation, textbooks developed based on it have been made use of. One notable change can be seen in the increase of the variety of vocabulary words learners need to be familiar with before they graduate from junior high school. Unlike the previous Course of Study Guidelines, which declared that approximately 1,200 words must be learned throughout three years of English learning in junior high school (MEXT, 2009), the new Course of Study Guidelines (MEXT, 2017a) intends to familiarize students with 1,600–1,800 words. At first, this increase seems to be beneficial for learners as it is a widely accepted idea that an increase in vocabulary size has a positive effect on one's reading proficiency (Hu & Nation, 2000; Laufer & Ravenhorst-Kalovski, 2010); however, the increase could simultaneously cause some disadvantages for learners.

For example, an oversupply of new words within a single textbook possibly prevents language teachers from only giving a brief description of a word to learners because they may unintentionally spend a huge amount of time explaining the meaning of a new word. According to Nation (2013), three aspects are involved in vocabulary knowledge, namely, form, meaning, and use. Each has three components. Form refers to knowledge related to (a) pronunciation, (b) orthography, and (c) morphology. Meaning refers to knowledge regarding (a) the meaning of the word form and a word form that can express the meaning, (b) the concepts the word has and referents of the concept, and (c) other words semantically associated with the word. Use refers to knowledge related to (a) grammatical functions, (b) collocations, and (c) registers to use the word or the frequency of occurrence of the word. Consequently, memorizing only word meaning is not sufficient. However, the more frequently new words appear, the more likely it is that teachers will be required to spend more time explaining their meaning, possibly leading to teachers imparting superficial knowledge of those words to their students. To prevent this from occurring, textbooks should provide an appropriate number of various words that are worthwhile for students to learn. Furthermore, it is a reasonable learning goal for learners to reach vocabulary thresholds needed for comprehension of a text (Nation, 2006).

For these reasons, treating a wider variety of words does not necessarily benefit students. Therefore, textbook designers should consider how well their textbooks are able to increase learners' vocabulary size to satisfy vocabulary thresholds for comprehension, rather than the variety of words learners can learn through their textbooks. This study thus explored this issue. In addition, it examined how much of the vocabulary, taught in MEXT-approved textbooks intended for junior high school students, were high-frequency words in order to determine whether textbooks developed based on the new Course of Study Guidelines provided sufficient worthwhile words for students to learn in terms of frequency.

Literature review

What variety of words do learners need to know?

Given that learners' goals are to reach vocabulary thresholds where sufficient comprehension can be achieved, what variety of words would learners need to know? This issue has been greatly controversial among researchers. In the 1990s, researchers suggested that 95% of the

running words in a text should be known for reading a text (Laufer, 1989; Liu & Nation, 1985) and for guessing from context (Liu & Nation, 1985). Subsequently, Hirsh and Nation (1992) argued that 97–98% coverage is needed to read a text for pleasure, which was empirically supported by Hu and Nation (2000). They gave the same text to four learner groups with a differing number of unknown words: 0%, 5%, 10%, and 20%. They conducted reading comprehension tests on the text and found a close relationship between the density of known words in a text and the likelihood of adequate comprehension of the text. None of the learners with 20% unknown words could comprehend the text adequately. With 90% and 95% of known words, some learners succeeded in comprehending the text; however, these thresholds could not ensure most learners' adequate comprehension of the text. They concluded 98% coverage was an optimal threshold for comprehension, which was echoed by Laufer and Ravenhorst-Kalovsk (2010); nevertheless, 95% coverage is also accepted as a minimum threshold for comprehension (Laufer & Ravenhorst-Kalovsk, 2010).

According to the previous studies reviewed here, two threshold levels can be suggested as reasonable targets for learners' goals, namely, 95% and 98% coverage levels. The most frequent 4,000–5,000 word families can provide 95% coverage (Laufer & Ravenhorst-Kalovsk, 2010); for 98% coverage, 8,000–9,000 of the most frequent word families are necessary (Nation, 2006).

Research into vocabulary taught in Japanese EFL textbooks

Most previous studies have investigated vocabulary in Japanese EFL textbooks primarily by measuring their vocabulary levels. For example, Chujo (2004) measured the vocabulary levels of combinations of junior and senior high school EFL textbooks by using the British National Corpus (BNC). The results showed that 95% coverage was achieved with the 3,200 most frequent lemmas of the list. In Wongsarnpigoon's (2018) study, it was found that 95% coverage of MEXT-approved textbooks designed for junior high school students was provided with the top 2,000 high-frequency words of the BNC.

Information on the vocabulary demands of textbooks is informative in evaluating the appropriateness of textbooks as teaching materials. If the vocabulary level of a textbook is too high to cover, for example, 95% coverage of it with basic words, the textbook might be inclined to teach vocabulary that learners will be less likely to encounter in the real world and would, therefore, need some modifications.

However, those previous studies might not be sufficient since textbooks are not reading materials but teaching materials. In this respect, the primary focus of research into vocabulary in textbooks should be on the investigation of how many types of high-frequency words students can potentially learn through textbooks. By doing so, textbook developers can ascertain how well their textbooks grow learners' vocabulary size to meet the necessary requirements for comprehension and would observe the potential deficiency in the variety of high-frequency words, which can then be used in revising textbooks. There are several studies on this issue conducted for coursebooks (e.g., Eldridge & Neufeld, 2009; O'Loughlin, 2012); all of these studies succeeded in insisting on the importance of supplemental input sources in addition to coursebooks. Despite this pedagogical importance, little research has adopted this perspective in Japan.

Please note that essentially, it would be almost impossible for junior high school students to meet all the necessary words for comprehension in textbooks throughout three years of

English learning as textbooks are too short to cover them. According to Waring (2009), 132,143 words are needed to meet each of the most frequent 5,000 words at least once, the requirement for achieving 95% coverage. However, the textbooks series analyzed in this study includes only 45,412 words (see Table 1). Nevertheless, this perspective can possibly provide valuable insights into the development of textbooks as observed in previous studies. Research questions addressed in the study were as below:

1. How much of the vocabulary in MEXT-approved textbooks consists of high-frequency words?
2. What variety of high-frequency words do learners meet in a set of three MEXT-approved textbooks?

As a follow-up study, I further investigated which levels of high-frequency words (e.g., the first 1,000-word level) MEXT-approved textbooks focused on and in which they had a deficiency in order to closely examine vocabulary in textbooks. The following question was used:

3. Which levels of high-frequency words do MEXT-approved textbooks focus on and in which levels is there a deficiency?

Methodology

Textbook corpus

In Japan, there are six series of MEXT-approved junior high school EFL textbooks, each consisting of three types of textbooks. Among them, the current study analyzed one series of textbooks, *Here We Go!* (Ota et al., 2021a,b,c), for the reason that unlike the other textbook series, it was possible to include all the English words that learners are supposed to encounter. Text data included those used in frontispieces to introduce each section, reading passages, language activities, example sentences to explain grammatical rules, and lists of new words. English words occurring in listening activities were transcribed by the author and included in the corpus. Significantly, to ensure representative sampling, the corpus includes both the reading and listening versions of the same passages, as the textbook series recommends that learners not only read passages, but also listen to them (see red circled part in Figure 1) and reading and listening passages often differ from each other. The information on the completed corpus is summarized in Table1.

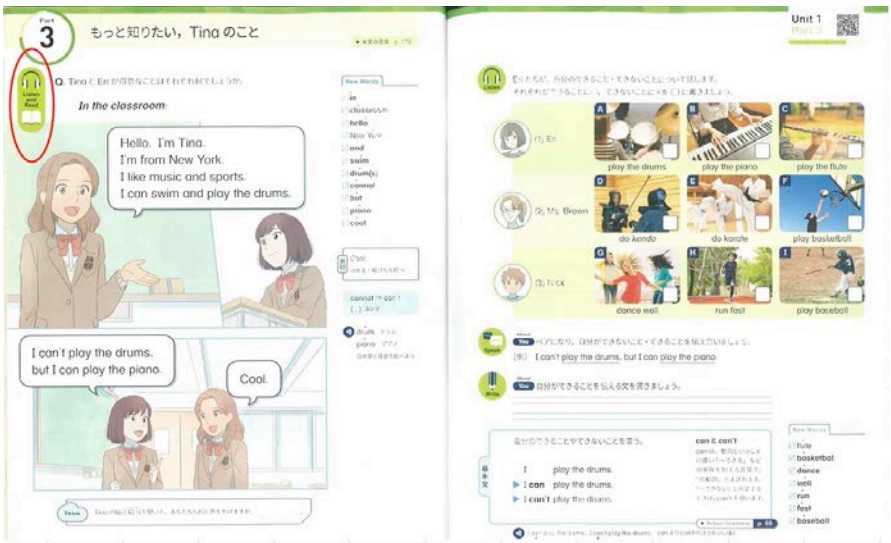

Figure 1: Screenshot of 'Here We Go!'

Textbook	Type	Token
Here WE Go! 1 (Ota et al., 2021a)	976	12,094
Here WE Go! 2 (Ota et al., 2021b)	1,319	15,835
Here WE Go! 3 (Ota et al., 2021c)	1,588	17,483
Total	2,434	45,412

Table 1: Information on the textbook corpus

New General Service List

Due to researchers' concerted efforts, there are numerous freely available word lists, for example, the General Service List (West, 1953) and the Academic Word List (Coxhead, 2000). In this study, the New General Service List (NGSL) ver. 1.01. (Browne et al., 2013), which is sourced from more than 273 million words within the Cambridge English Corpus and can cover approximately 92% of the words in a general text with 2,801 words (Browne, 2021), was used. Unlike those widely used word lists applying the word family count, where the base form of a word and its inflections and derived forms of the word are counted as one word, Browne et al. (2013) counted words with a modified lexeme approach that corresponds to the word counting unit of *flemmas* (McLean, 2017). Their modified lexeme and McLean's flemma word counting unit include the inflected forms of a word in different parts of speech in addition to those in the same part of speech.

Procedure

The procedure of the study largely followed that of Nakayama (2021) for the analysis of MEXT-approved textbooks intended for senior high school students. He adopted a unique approach for the study as currently available corpus-analysis tools compatible with the NGSL such as AntWordProfiler 1.5.1 (Anthony, 2021), the Online Graded Text Editor (Waring & Browne, n.d.), and VocabProfiler (Cobb, 2021a) are not geared toward analyzing the NGSL itself but only imported texts of interest. Another rationale for not using these tools were that they sometimes incorrectly identify the intended meaning of homographs or components of contracted forms (e.g., "I'd" used as "I would" or "I had").

Following Nakayama's (2021) study, this study also analyzed the textbooks with Text Lex Compare ver. 4.2. (Cobb, 2021b). This tool compares two different texts and informs us of the number of tokens, word types, word families, and word phrases used in, and unique to, each of the imported texts. To compare the textbooks with NGSL in a reasonable way, all the words in the textbooks were replaced with their headwords based on the modified lexeme approach by using the replacement function of Microsoft Word 2016. This was also used to separate contracted forms. Semantically opaque ones as in the example above and homographs were replaced with their headwords while considering the surrounding context.

Text data after these treatments were loaded into WordSmith 7 (Scott, 2016) to produce word lists; they were used to visually ascertain whether every word in the textbooks was successfully replaced with its headword. Information on the corpus after these treatments is summarized in Table 2.

Textbook	Type	Token
Here WE Go! 1 (Ota et al., 2021a)	608	11,227
Here WE Go! 2 (Ota et al., 2021b)	866	14,661
Here WE Go! 3 (Ota et al., 2021c)	984	16,576
Total	1,401	42,464

Table 2: Information on the corpus after the treatments

The NGSL comprises 52 supplemental words, including days of the week, months of the year, and numbers. These words were considered for calculating the lexical coverage of the textbooks to prevent their frequent recurrences in a single textbook from underestimating the lexical coverage of each book. In contrast, they were not considered for the calculation of the coverage of NGSL words, for the reason that not presenting all numerals or months of the year in a single textbook would be impossible. Using Text Lex Compare, the lexical coverage of the textbooks, i.e., (a) and the coverage of NGSL words, i.e., (b) were calculated with the following formulae:

(a) (Number of words in the textbook – Number of words unique to the textbook)/Number of words in the textbook
(b) (2,801 – Number of words unique to the NGSL)/2,801

Unlike other word lists that are often broken down into 1,000-word bands, the study used 560-word frequency bands just as researchers used the NGSL for the creation of a reliable and valid diagnostic and placement test of NGSL knowledge (Stoeckel & Bennett, 2015) or that of free flashcard learning apps (Browne & Waring, n.d.).

Japanese EFL learners begin to study English as a compulsory subject from the 5th grade of elementary school with 70 classes a year, and MEXT (2017b) intends to familiarize elementary school students with 600–700 words, implying that junior high school students have only started English learning and have not been exposed to most of the high-frequency words required for comprehension. In this respect, the skewness of high-frequency words within a frequency band is a crucial problem because they cannot encounter some higher frequency words. In order not to overlook the skewed distribution of words within a band as much as possible, the study analyzed the textbooks by a narrower size of word bands.

Results

Lexical coverage of the textbooks by the NGSL

According to Table 3, regardless of the number of tokens used in the textbooks, 95% of words were covered by the NGSL.

Grade	Number of tokens	Number of tokens outside the NGSL	Coverage
JH1	11,227	551	95%
JH2	14,661	738	95%
JH3	16,576	727	96%
Total	42,464	2,016	95%

Table 3: Results of the lexical coverage analysis

Coverage of the NGSL by the textbooks

Table 4 illustrates the extent to which the textbooks covered NGSL words. Obviously, the textbooks intended for higher graders produced higher coverage for the NGSL. Users of this textbook series can potentially meet 37% of NGSL words.

The combined results of the two types of coverage analyses indicate that the textbooks were largely composed of NGSL words, but they covered only a very small part of the NGSL with 37% throughout three years of English learning in junior high school.

Grade	NGSL words not covered by the textbook	Coverage
JH1	2,311	17%
JH2	2,113	25%
JH3	2,000	29%
Cumulative	1,758	37%

Table 4: Coverage of 2,801 NGSL words by the textbooks

Distribution analysis

Lastly, we examine which of the 560-word frequency bands the textbooks focused on and of which there was a shortage. In Table 5, the columns (a) stand for the percentage of tokens occurring at the frequency band; the columns (b) stand for the coverage of the frequency band by the textbook.

Grade	NGSL 1 (1–560)		NGSL 2 (561–1120)		NGSL 3 (1121–1680)		NGSL 4 (1681–2240)		NGSL 5 (2241–2801)	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
JH1	81.2%	48.9%	6.4%	16.4%	3.3%	11.1%	2.0%	5.2%	1.4%	5.7%
JH2	82.2%	62.7%	6.6%	26.8%	3.1%	16.8%	1.7%	8.8%	0.9%	7.8%
JH3	81.4%	72.9%	6.2%	31.6%	3.9%	20.5%	1.8%	10.0%	1.1%	8.0%
Cumulative	81.6%	80.5%	6.4%	42.5%	3.5%	30.2%	1.8%	16.8%	1.1%	16.2%

Table 5: Distribution of words occurring in the textbook across five frequency bands

There are two common characteristics across the three levels of the textbooks. First, looking at the columns (a), NGSL words at higher frequency bands occurred more frequently in every textbook than those at lower frequency bands. Second, all the textbooks produced higher coverage for higher frequency bands.

Overall, the textbooks for higher graders better covered the NGSL. Another notable fact is that the coverage of the NGSL decreased not gradually but sharply after the first frequency band. Students who use this textbook series cannot be exposed to over 50% of NGSL words through the second to third frequency bands.

Discussion

The lexical coverage analysis showed that every textbook of interest was largely composed of NGSL words with a greater than 95% coverage. This result reasonably matched Wongsarnpigoon's (2018) findings that 95% coverage of MEXT-approved junior high school textbooks was provided with the top 2,000 high-frequency words in the BNC. Therefore, the vocabulary words the students who use this textbook series meet is worth learning in terms of

frequency. The distribution analysis identified that the textbooks covered a wider variety of words at higher frequency bands with higher frequency. Additionally, the textbooks for higher graders produced higher coverage for the NGSL as well as for each frequency band. In conclusion, learners can possibly learn core words in descending order of frequency, and the textbook series is designed so that users can widen their vocabulary size of high-frequency words as they go to higher grades.

In contrast to these advantages, the coverage analysis of the NGSL exposed the shortage of high-frequency words in the textbooks in terms of variety. Users of the textbook series cannot meet 63% of NGSL words (i.e., 1,043 NGSL words) throughout three years of English learning. Moreover, the distribution analysis identified that students cannot be exposed to most high-frequency words other than those at the first frequency band. Therefore, having learners use supplemental input sources would be helpful for them.

Here, it could be worth mentioning that the textbooks analyzed in this study better covered the NGSL than most of the MEXT-approved senior high school textbooks analyzed in Nakayama's (2021) study, not only at an overall coverage level but also at each frequency band level. He analyzed three MEXT-approved senior high school textbooks intended for 1st, 2nd, and 3rd graders respectively. Among them, all the 1st graders' books did not cover the NGSL as much as the 1st graders' book analyzed in this study. In addition, the 1st graders' book produced higher coverage for each of the five frequency bands than four types of senior high school textbooks. For the 3rd graders' junior high school textbook, it produced higher coverage, both for the NGSL and for every frequency band, than six types of senior high school textbooks. This superiority of junior high school textbooks is possibly due to differences in the design of corpora. Compared to the current study, limiting the scope of language data to reading passages produced lower coverage than that observed in this study. Nevertheless, junior high school textbooks may prove more useful for learning high-frequency words.

For junior high school textbooks to include a wider variety of high-frequency words, a specific suggestion to textbook designers is to decrease the number of recurrences given to items recurring many times and use the space allocated to them in order to present high-frequency words not taught in the book. Repeated exposure to an item is an important factor in vocabulary learning (Waring & Takaki, 2003; Webb, 2007). For this reason, researchers disputed the insufficient recycling of words within a textbook (Waring, 2011; Wongsarnpigoon, 2018). Nevertheless, textbooks are not designed for those who learn vocabulary in an incidental manner. Textbook users would study hard for term tests and can receive a pedagogical intervention, so they can learn vocabulary through a variety of ways such as language activities, teachers' explanations, peers' utterances, homework, and so on. Thus, it is less likely that students, at least Japanese learners, are exposed to every word appearing in textbooks only once. In other words, students may need fewer encounters to gain knowledge of one word than those who get the input of vocabulary only from reading books. Textbook designers need to consider the distribution of the word within the textbook, rather than the number of repetitions of the item. Specifically, textbook designers should develop textbooks so that high-frequency words appear periodically to increase the chance that learners can become familiar with them and not forget them easily. This kind of repetition is necessary for learners from the perspective of the spacing effect, the phenomenon that people can better retain what they have learnt when their repeated exposure to items have time intervals than when their repeated exposure to them are massed (Nakata, 2015; Sobel et al., 2011). Therefore, if textbook designers make concerted efforts to allow

high-frequency words to appear periodically within a textbook, it could be possible for textbooks to expose learners to a wider variety of high-frequency words and to acquire them even with a relatively limited number of recurrences.

Designing textbooks in this way can result in a shortcoming that learners may be exposed to each item in a way that differs from how it is used in the real world and cannot learn multiple aspects involved in one word as described by Nation (2013). To compensate for this, engaging students in extensive reading can be helpful. As learners are exposed to known words repeatedly, they can deepen their existing knowledge of them (Waring & Takaki, 2003; Webb, 2007). However, in this way of learning there are some drawbacks to consider. First, it would take a huge amount of time to learn core words not appearing in textbooks as no one is able to anticipate when learners can meet unknown words; therefore, it may result in wasting time (Waring, 2009). According to Cobb (2008), reading over 375,000 words using graded readers is still not sufficient for learners to gain knowledge of even the 3,000 most frequent words. Second, for extensive reading to work well, it is indispensable that "only a small proportion of the language they need to use is not familiar to them" (Nation, 2007, p. 2). It is possible that such beginners as junior high school students in Japan cannot read even simplified text in the first place and, therefore, they cannot enjoy the benefits of extensive reading.

These disadvantages of extensive reading can be compensated for with deliberate learning (Nation, 2015). To teach high-frequency words that students cannot encounter in their textbook series, teachers can ask their students to learn those words from word cards (Nation, 2013). However, if teachers did not have the word list of the textbook they use in the classroom, a coverage analysis of a word list comprised of high-frequency words (e.g., NGSL) by the textbook, as done in this study, would be indispensable, validating the usefulness of this analytical approach, which has been less adopted in Japan. This deliberate learning would allow learners to work on learning worthwhile words without wasting time. At the same time, learners can probably acquire a fundamental capability for doing extensive reading.

A reasonable approach is to incorporate an extensive reading program into a regular English course as suggested by Waring (2009), together with deliberate learning (Nation, 2015). By doing so, it is possible for the two language sources to compensate for each other's limitations and for learners to take advantage of both.

Conclusion

This study analyzed vocabulary taught in one series of MEXT-approved textbooks intended for junior high school students. The two types of lexical coverage analyses suggested that what users of the textbook series encounter is highly likely to be high-frequency words with a greater than 95% coverage of the NGSL, but they cannot be exposed to a large proportion of the list, with a smaller than 37% coverage, which answered the first and second research questions. For the third research question, the distribution analysis indicated that the vocabulary words that learners often meet in the textbooks were those at the first 560-word frequency band; throughout three years of English learning using this textbook series, users can be exposed to over 80% of NGSL words at this band. However, the analysis indicated a shortage of NGSL words through the second to third frequency bands, with a smaller than 50% coverage of each band. Lastly, the importance of learning sources other than textbooks

was discussed as pedagogical implications. Specifically, the combined approach of extensive reading and deliberate learning using word cards can be a suitable option.

This study indicated that MEXT-approved textbooks for junior high school students do not provide a sufficient variety of words needed for comprehension, and this is also the case for senior high school textbooks (Nakayama, 2021), indicating the possibility that Japanese EFL learners have not mastered core words before they graduate from senior high school. Therefore, language teachers at all school levels including the junior high school, senior high school, and college cannot presuppose that their students have already mastered at least core words and disregard teaching them. In fact, they might need to put a primary focus on core words in anticipation of learners' insufficient knowledge of those words, or else, some Japanese EFL learners will never be able to read any authentic text without help from other sources such as a dictionary and teachers.

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Preparing Empathetic Teacher Candidates': A Cultural Simulation of Japanese Internment in Hawai'i

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The IAFOR International Conference on Education in Hawaii 2021
Official Conference Proceedings

Abstract
In this phenomenological study, learning about empathy through the Japanese Internment in Hawai'i was explored by analyzing the experiences of seventeen undergraduate teacher candidates after visiting the Japanese Cultural Center in Honolulu, Hawai'i. Data gleaned from surveys, self-reflection, peer reflections, and photovoice assignments were analyzed using clustering and themes. Findings reveal the depth of candidates' empathetic lens from historical, cultural, and social empathetic lenses. The research offers implications for teacher preparation programs on the use of cultural simulations for developing teacher candidates' empathy for understanding others and working with culturally and linguistically diverse students.

Keywords: Empathy, Teacher Candidates, Teacher Preparation, Culturally Responsive Teaching, Japanese Internment

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Introduction

Culturally responsive teachers recognize the importance of including students' cultural references in all aspects of learning (Ladson- Billings, 1994); they are empathetic because they "care so much" about *culturally and linguistically diverse* (CLD) students and insist on holding them to the same standards as other students (Rychly & Graves, 2012). The percentage of CLD students who attend public schools in the United States (US) is on the rise (National Center for Education Statistics [NCES], 2018). CLD students often speak or are exposed to a language other than English at home and are therefore not fully proficient in the English language, despite English being used as the language of classroom instruction in US public schools (Rhodes et al. 2005). Even though CLD students are the fastest-growing student population in US public schools, they are the student population that teachers feel the least prepared to work with (Samson & Collins, 2012). As a result, teacher preparation programs (TPPs) work to better prepare teacher candidates (TCs) for working effectively with CLD students, using culturally responsive teaching (CRT) as a framework to guide teacher education coursework (Donahue-Keegan et. al., 2019). A central characteristic of CRT is empathy (Gay, 2018) and is vital to support teacher candidates development of empathy during their teacher preparation years.

Teacher education research empathy as being an important teaching disposition (Bullough, 2019; Warren, 2014; Warren & Lessner, 2014). Given the rapid increase in the number of CLD students in US public schools (NCES, 2018), it is imperative to understand how TCs develop empathy while in a TPP. To our knowledge, this has not yet been studied. This research aims to shed light on how teachers may be prepared with empathy for working with CLD students. As three teacher educators in Hawai‘i, the idea to conduct this research came about when we learned that seventeen teacher candidates (TC) in our cohort had limited knowledge of the Japanese Internment Camps in Hawai‘i during World War II. Over half reported not learning about the internment camps during middle and high school. The third author (the granddaughter of a Japanese internee in Hawai‘i) was involved in a commemoration acknowledging the innocent lives lost in internment camps. Research ensued to explore how a cultural simulation of the Japanese Internment Camps in Hawai'i influenced teachers candidates' learning of empathy.

Literature Review

Empathy is described as being emotional and intellectual (Warren, 2014) or affective and cognitive (Bullough 2019). Emotional or affective empathy is low-level empathy because it involves feelings, while intellectual or cognitive empathy are high-level because it requires perspective-taking and critical thinking (Warren, 2014). Others, conceptualize empathy as being either historical, cultural, or social (Priddy, 2017). Historical empathy pushes students out of the present in order to understand people living in the past. Cultural empathy engages students with cultures outside of their own experiences and challenges their biases. Social empathy includes engaging activities where students learn and listen to one another's perspectives and create new learning. Social empathy is the ability to understand people by perceiving their life situations and as a result, gaining insight into structural inequalities and disparities.

Empathy is challenging to teach and requires ongoing intentional efforts by teacher educators (Ullman & Hesch, 2011; Warren & Hotchkins, 2015). Frameworks used to prepare TC for urban classrooms must account for the multiple ways that teachers express empathy in their

professional work (Warren, 2014). For instance, school curriculum tends to avoid controversy, conflict, and the realities of sociopolitical issues plaguing urban communities. Consequently, teachers may feel that discussion on these issues is daunting, time-consuming, and emotionally draining. Thus, the challenge is for teacher educators to bring the perspectives, positionalities, and contextual realities of racial, social, and ethnic groups into classroom instruction to better prepare TCs for culturally responsive teaching.

Using Cultural Simulation Activities to Develop Teacher Candidate Empathy

A cultural simulation experience "is an instructional technique that attempts to recreate certain aspects of reality to gain information, clarity, values, understanding other cultures, or developing a skill" (Cruz & Patterson, 2005, p. 43). Simulations may provide a basis for empathy exercises because they help TCs develop socio-cultural consciousness and build affirming attitudes about differences. During a simulation, participants (players) assume a role in an authentic situation. Simulations are often categorized as being a: (a) cross-cultural community-based learning experience in another cultural context, (b) explicit teaching about explorations and reflections on a specific culture while observing or working in that particular setting, or (c) structured field experience in a formal or informal educational setting (Cruz & Patterson, 2005, Smolcic & Katunich, 2017). A simulation should culminate with opportunities for participants to reflect on their experience (Padua & Smith, 2020).

Teaching Empathy Through Interdisciplinary Collaboration

Interdisciplinary instruction builds collaborations between teachers of two or more fields of study to facilitate the integration and synthesis of knowledge (Stember, 1991). While in teacher preparation years, TCs need interdisciplinary experiences to meet the social, cultural, linguistic, and intellectual demands of an ever-growing multicultural student population (Rhodes et al., 2005). Research on how interdisciplinary approaches may be used in teacher preparation is scant. To date, the majority of research reporting on interdisciplinary work centers on science, technology, engineering, and math education to describe how in-service teachers' practices align with cross-disciplinary, multidisciplinary, or interdisciplinary instruction and the influences these practices have on student learning (Weinberg & Sample McMeeking, 2017).

Culturally Responsive Teaching

Culturally responsive teaching seeks to improve the school success of culturally linguistically diverse (CLD) students. CRT contends that explicit knowledge about cultural diversity is imperative to meeting the educational needs of CLD students (Gay, 2018). A culturally responsive educator makes deliberate and intentional teaching praxis to promote learning opportunities for *all* students regardless of race, ethnicity, gender, sexual orientation, language proficiency, able-mindedness/body, or socioeconomic class (Farinde-Wu, Glover & Williams, 2017). Culturally responsive teachers place cultural diversity in every subject they teach, in every content area, so school is more interesting, representative of, and responsive to CLD students.

Hawai‘i: Past and Present

Hawai‘i is the only state outside the continental United States (US) located in the Western Pacific. During the 1800s, Hawai‘i was recognized as an international kingdom governed by

a royal family. In 1893, American Colonists overthrew the kingdom and established the Republic of Hawai‘i. In 1898, the US government annexed Hawai‘i resulting in the state becoming a territory (Lichtenstein, 2008). On December 7, 1941, the Japanese military attacked the US military forces stationed at Pearl Harbor. Hours after the attack, amidst fears of invasion, martial law was declared in Hawai‘i (National Park Service, 2017). The US military issued an order to seize persons of Japanese ancestry, deeming them as “enemy aliens.” Martial law severely affected Japanese Americans residing in the Continental United States and territory of Hawai‘i. Under Executive Order 9066 (issued on February 19, 1942). Two internment camps, Sand Island and Honouliuli, are located on the island of O‘ahu. The *Honouliuli Internment Camp* served as civilian Internment and *prisoner of war* camp starting in 1943. It was the largest internment camp in Hawai‘i and was also known as *Jigoku-Dani* (Hell Valley) due to the secluded location in a deep gulch that trapped heat. Over 2,000 Japanese in Hawai'i were interned despite the majority being American citizens by birth. Most internees were influential Japanese citizens in the community, such as teachers, priests, or business owners. In Hawai‘i, martial law expanded over 35 months of Japanese Internment, the longest period in US history of the civilian population.

Situated Learning for Historical Empathy

This study utilizes tenets of situated learning theory (Lave & Wegner, 1991) and a modified version of Endacott’s (2014) work on empathy through a historical context. Situated learning theory proposes that learning takes place when individuals actively participate in an experience. The individual is “situated” in the learning experience and acquires understanding by participating in an activity. A cultural simulation is an example of situated learning content because individuals are actively participating in unfamiliar experiences to gain a better understanding of culture. Endacott studies historical empathy through activities requiring *cognitive-perspective taking* (i.e., understanding others’ experiences, beliefs, attitudes, positions in the given situation from the past) and *affective connection* (i.e., connecting how the lived experience or situation influenced their affect). This study modifies Endacott’s description of empathy by including interdisciplinary instruction and cultural simulations to teach TCs about empathy.

Methodology

A phenomenology is an approach to understanding the world from one person’s *lived experience (phenomenon)* or a life event and how it is transformed into consciousness (Moustakas, 1994; Sloan & Bowe, 2014). In this study, the *lived experience* is the participants’ visitation to the Japanese Culture Center (JCCH). This phenomenological study is guided by the following research question: How did knowledge of the Japanese Internment Camps in Hawai’i influence teachers candidates’ learning of empathy?

Japanese Cultural Center of Hawai‘i (JCCH)

In 1986, the Japanese Chamber of Commerce began the Japan-Hawai‘i Culture Center project, *The Dream,* to preserve the legacy and history of Japanese immigrants (Japanese Cultural Center of Hawai‘i, 2021). The goals were for (1) present generations of Japanese Americans to learn about their ancestors’ sacrifices and contributions made by their ancestors to make their lives today possible, and (2) to leave a legacy for future generations to connect to Japanese ancestors. Before the visit, planning for the simulation activities occurred between the third author and the JCCH Education Outreach Coordinator.

Participants

Seventeen participants from one elementary education cohort were in this study. Eight were born in Hawai‘i, and nine were born on the US mainland. All were female, in the third semester of the TPP, and pursuing a bachelor’s of education degree. They were from diverse ethnicities, but most were of Asian descent (see figure 1). Six were earning an additional license in multilingual learning. The *Institutional Review Board* approved this study, and all participants gave informed consent. Participants were enrolled in four methods courses: social studies, math, introduction to multilingual learners, and elementary field experience. Method instructors collaborated to develop an interdisciplinary approach aimed at building participants’ knowledge through various cognitive lenses of examining Japanese immigration and Internment in Hawai’i to (1) shift participants’ thinking away from the mindset that state history is only taught during social studies and (2) to understand the need to be empathetic about historical events that may shape students’ realities in the field experience classroom.

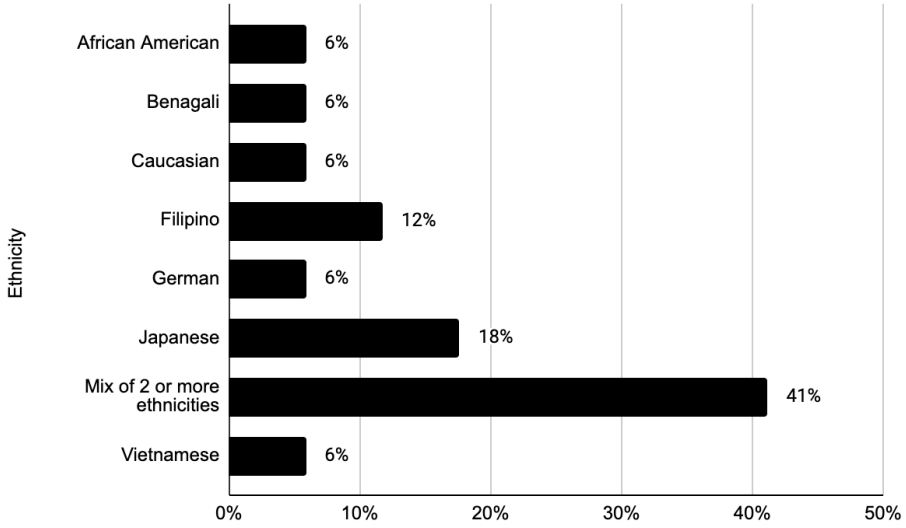

Figure 1: Ethnic characteristics of participants

Lived Experiences

Two rotations with various simulations were designed for TCs to learn about the Japanese culture and internment camps. The first rotation was Discovery Boxes that included games and toys to develop participants’ understanding of the play limitations Japanese immigrants experienced. The docent started the activity by posing questions to the TCs, such as *What is a toy? What can you use to make a toy?* Since immigrants were poor, the docent explained that immigrants entertained themselves by creating toys and games using everyday recycled objects such as bottle caps and string. In turn, TC’s simulated these experiences with creating toys.

In the second rotation, TCs toured two galleries. The first gallery, *Okage sama de*, *I am who I am because of you,* consisted of historical artifacts of the Japanese immigration and their lifestyle in Hawai‘i. Participants engaged in simulation activities such as dressing up in Japanese clothing and viewing primary and secondary sources. The gallery featured artifacts and images reflecting the Japanese immigration experience, working at the sugar cane plantations, going to school, and establishing Japanese businesses. The next gallery

emphasized the internment camp, World War II and Americans of Japanese Ancestry. One simulation activity included a reenactment of the arrest of a Japanese man.

Data Collection

Surveys, online reflections, and a photovoice assignment captured the participants' voices and interpretations. The selected methods allowed expressions of personal viewpoints of the past and present so that TCs could learn their peers' perspectives.

Survey

Similar to Ohn's research (2013), a survey was administered before and after the JCCH visit to assess any changes in TCs perceptions of Japanese Internment and immigration to Hawai'i. The survey included open and closed-ended questions.

Online Reflections

TCs wrote online reflection posts based on prompts (written by the authors). The prompts encouraged TCs to share interpretations and build new knowledge about the Japanese Internment based on course readings, the field practicum, and personal experience. At the end of their response, TCs were asked to pose a divergent question for a peer to respond in the following week. To engage in a peer response assignment, TCs read all of their classmates' responses, then replied to one peer's responses. The responses allowed TCs to orient themselves as a community and the interpretations of the academic literature. Through collaborative online reflective conversations, TCs challenged, affirmed, or built new ideas and knowledge about Japanese Internment.

Photovoice

During the JCCH visit, TC took digital photos (or videos) of artifacts capturing concepts (e.g., empathy, multilingual instruction, equity, culture) based on requirements determined by their methods instructor. The final product was a narrated photovoice essay using Google Docs or PowerPoint. Photovoice (Power et al., 2014) allowed participants to capture emotional geographies or whose preference is to present images over words.

Data Analysis

Data were analyzed using Moustakas' (1994) phenomenological approach. Phenomenology takes into account how the human experience rises to consciousness on a single phenomenon or a *lived experience* (Merriam, 2009; Moustakas, 1994). Each person's lived experience is considered equal value and a contribution for others to consciously learn about one's perspective, embracing the notion that each individual engages in the same experience differently. The researchers used an inductive process, coding statements and treating each one as equal value regardless of its origin to create short textual descriptions. Data were reduced by clustering codes according to descriptions then formulating into *textual qualities* (Moustakas, 1994) by themes to generate possible meanings. The researchers exercised *imaginative variation* (Moustakas, 1994) in which examination of themes from varying perspectives were sought to better understand the participants' phenomena at the JCCH. To ensure trustworthiness, the researchers discussed and confirmed the agreement of how sources were coded, interpreted, and sought clarification of meanings if needed. Codebooks

and memos were written as other forms of trustworthiness or *epoche* (Moustakas, 1994). *Dedoose* assisted with storing and organizing data.

Findings

The purpose of this research was to understand how learning about the Japanese Internment camps influenced TCs learning of empathy. In adhering to anonymity, the embedded anecdotes about an individual's lived experience are represented in parenthesis abbreviated as teacher candidate (TC) and participant number. Findings are presented according to Priddy's (2017) empathetic lenses (e.g., historical, social, and cultural).

Historical Empathy

All participants had a general understanding of historical empathy at the literal level and cited this lens the most in their work. They saw historical empathy through artifacts or activities, but few elaborated on why these items were selected. For instance,

"I believe it was easy to be drawn to this (historical) lens and we were in an environment filled with primary and secondary sources from the beginning of Japanese immigration to Hawai'i to World War II and Japanese internment." (TC10)

The amount of time learning about historical empathy in methods courses may have influenced decisions in capturing images for the photovoice essay.

"Half of the exhibit was historical, and in this particular part of the tour, I was drawn to the old pictures, quotes, and artifacts from those who were interned." (TC8)

Contrastively, participants who applied historical knowledge at a deeper affective level, elaborated on artifacts triggering their emotions. In this example, one person envisioned the impact on a family member.

"All throughout JCCH there were artifacts and personal quotes. While reading the quotes I could feel myself becoming emotional because I cannot imagine how it would feel to have my family ripped apart, or to see my brother taken away to go to war. I could feel how hurt, scared, angered and/or empowered these people felt through these quotes. I think seeing these quotes posted on the walls really hit me hard." (TC16)

Japanese immigration is defined by generations. Issei is Japanese people emigrating to a country. Immigrant children born in the new country are called ***nisei***. Comparing generational experiences was seen by one participant who explained,

*"I am a Japanese **nisei** myself, but from a different generation of **nisei** compared to those who are displayed in the photos. Although I can connect to those who have Japanese parents but born and educated in the US, I did not experience war, mistreatment, discrimination, or trauma like those who did during the war."* (TC15)

Primary and secondary resources triggered comparative feelings between artifacts from the past and present as critical resources for student learning.

"I feel that the current generation of students are not exposed to artifacts from the past, so people begin to lose and forget what it was like if you had no money, constantly being resourceful, and managing daily life with what you have. I believe that by presenting these artifacts and items to students, they can appreciate what they have, relate the items to their culture or homes, and be educated on how we can be resourceful and reuse items as well." (TC15)

"Primary sources and artifacts get students excited to engage further with the content being taught. The use of artifacts can also help students to develop empathy for the people during a certain time period or event. The pictures to the right are of items that internees made as gifts for their families." (TC9)

Artifacts, simulation activities, and interactions with the docents deepened their knowledge in various ways. One person wrote,

"*Although I have been to the Japanese Cultural Center many times in the past as a student, I never delved into the past as much as I did on our field trip. Much of it was review and reminiscence, but also a learning experience through the artifacts and letters that were written by the people who lived through the war and internment camps."* (TC15)

In the post-survey, participants self-identified their change in knowledge of the Japanese Internment Camps. Seventy-one percent responded "extensive change," 24% responded "some change," and five percent responded "minimal change."

Cultural Empathy

Since many participants come from Asian backgrounds, data on cultural empathy was sparse. Perfunctory responses were common such as:

"Cultural empathy challenges a student's biases and encourages them to understand a culture outside of their own." (TC14)

"Challenging students cultural biases may achieve cultural empathy." (TC4)

For the few who resonated with cultural empathy, modest insights about ethnic identity were offered.

"The empathetic lens that I mostly captured would be cultural. I believe that I was drawn to this particular lens because as I was observing and learning about the artifacts and the meaning behind each one, it made me relate to my own identity (as) being Filipino and what values and other beliefs that I share with another culture." (TC13)

"This brings up the idea of assimilation versus acculturation. As my professor said, *assimilation is this idea of a melting pot where everyone blends in, but acculturation is more like a salad in which people retain their cultural markers. I certainly would not want my students or anyone to deny their heritage just to become more American because that's not what America is or should be about."* (TC9)

Visuals and realia influenced participants' perspective-taking of empathy. As one participant expressed:

"It was interesting to see how we both saw the same picture but took something completely different from it. For example, take your first photo slide from 317 showing the two different men, one during the Internment and the other now. I saw that picture as a way to remember the past, and how it is important to teach the new generation about what happened back then so it does not happen again." (TC19)

"Using visuals such as pictures are also beneficial for multilingual learners during instruction. Students may not be able to understand information that is given to them orally or written, but the use of visuals can help their understanding. The use of visuals and written or oral language allow students to make connections to the concept." (TC6)

Participants saw how visuals could be used for culturally responsive teaching, noting that empathy is needed to understand others.

Social Empathy

Social empathy was not as prevalent and most were superficial. Broad phrases such as *listening to others' perspectives*, *appreciating others*, or *collaborating to form new learning,* were frequently written. Minimal elaboration was made to their thinking such as:

"Social empathy encourages students to think about the perspectives of others around them to support effective teamwork between students." (TC7)

Peer responses permitted individuals to delve deeply and validate each other's thinking.

"In your first two slides, you talked about the varying perspectives of different people during World War II, such as those of the interned Japanese and those of people on the outside. I think it's incredibly unjust that the stories our government tells our children doesn't include the wrongs that were committed against our own people, and I agree with you that it's imperative that we explore historical empathy and don't allow these acts of discrimination to happen again." (TC2)

The inclusion of audio recordings provoked personal recounts of immigration built new learning of social empathy.

"His-story versus my story. It made me think about how sometimes our own voices aren't shared, we end up not understanding ourself. It falls under the mystery of identifying who we are. And I think that if we just take the time to develop a deeper understanding of ourself, then we could share our own story. Being able to be an instructor and allowing my students to understand their roots and their identity is just a great way to have them to be a part of the classroom and to share their uniqueness with their peers." (TC13)

Participants promoted critical discussions about the practicality and appropriateness of activities at the JCCH for elementary students.

"Not all field trips are effective, but ones like JCC have the ability to impact students in huge ways. This impacts my teaching philosophy by motivating me to search for meaningful field trips that hold lifelong learning experiences for my students." (TC8)

"First, I am not sure that I would have my Kindergarteners go through the Honouliuli exhibit. I do not feel that it is necessarily appropriate for students of such a young age. If I were to take my class, I would love to do the mystery boxes and the Okage Sama De exhibit." (TC8)

"The JCC is a great place to give that sense of belonging to some students. It also allows the students to understand some of the history of the place they call home. A time to remember the past so that the future does not turn out the same." (TC11)

Discussion

Foundational knowledge of empathy was achieved by engaging participants in various activities prior to the JCCH. The simulations aligned with Endacott's (2014) stance of "building and connecting knowledge" (p. 6) through a historical inquiry that is contextual, offers perspective-taking, and affective connection. All participants achieved perspective-taking; however, the affective connection was limited to a small number of participants. This finding aligns with Endacott (2014) on ensuring a balanced approach to cognitive and affective perspectives. The pre-visit activities were rich and added empathetic knowledge. For example, Kawamoto's (2018) video, *Voices Behind Barbed Wire,* evoked an emotional discussion among TCs. Since realia and primary resources triggered emotions at JCCH, we should have created a process for TCs during the simulations to understand how the past affected their emotions, thinking, or actions in the present (Endacott, 2013). We believe these could strengthen their affective domains and empower TCs to design plans on how to act or incorporate empathetic teaching in the future and their daily lives

While building background was an asset, the researchers' decisions might have created bias or influenced TCs perspectives. Activities were aligned with the Japanese version of the situation; thus, eliminating counternarratives such as the decisions made by the US government or military. Some participants had military ties, and most participants were of Asian descent. We are unclear if participants engaged with a false sense of involvement or an emotional distance (Ullman & Hesch, 2011; Warren & Hotchkins, 2015) to their own identities and to sustain established relationships with their peers. Future work would include *pedagogy of discomfort* (Zembylas & McGlynn, 2012) in which all involved would develop mutual understanding, confront tensions, and unconscious complicity.

We acknowledge the limitations of this research. First, the researchers' access to the participants were effortless. A safe environment was established due to the cohort design. Other researchers may not have similar access if they were to replicate this study. Secondly, the JCCH had artifacts from the Japanese viewpoint in Hawai'i. Other population groups or internment camps on the US mainland were not discussed. The JCCH visit triggered emotions that may not have the same effect as a virtual field trip or at gallery.

Conclusion

This research advocates teacher preparation programs to include the teaching of empathy with teacher candidates so they are prepared for working effectively with CLD students in urban classrooms. Cultural simulations is an effective way in learning about empathy.

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Engaging Students to Chinese Language Enhancement Classes With Communication-Intensive Components

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
One of the University educational aims for undergraduate curricula in the University of Hong Kong is to enhance and promote communication and collaboration among students. The goal is to provide students with consistent and constant opportunities to communicate effectively in academic, professional, and social settings. Furthermore, the university is committed to the facilitation of environments in which students continually work with others and learn how to make constructive contributions in group work. The University approved the Communication-intensive courses initiative in 2018-19 by recognizing courses that provide HKU students with the core communicate competences needed for creative, economic, and social success on campus and in the workplace. In traditional classrooms, students learning Chinese are expected to listen to lectures and work on related assignments to strengthen their understanding and mastery of the knowledge gained in class. However, in CiC courses, the focus is on the four main areas of communication: (i) oral literacy, (ii) written literacy, (iii) visual literacy, and (iv) digital literacy. In our Chinese language enhancement courses, which are Communication-intensive badged, students gain communication skills through a variety of activities including in-class discussions, assessed and non-assessed tasks and/or assignments, guest workshops, and peer and teacher feedback on both speaking practice and written assignments. After completing the CiC courses, our students develop certain abilities and attributes of effective communicators. These courses enhance our students' communication skills, which was demonstrated by the results of the pre-course and post-course surveys.

Keywords: Communication-Intensive, Communication Competence, Oral Literacy, Written Literacy, Visual Literacy, Digital Literacy, Attributes of Communicators, Chinese Language Learning

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Introduction

HKU Communication-intensive Courses (CiC) Initiative

At a formal meeting in November 2018, the Senate of the University of Hong Kong approved the Communication-intensive Courses (CiC) initiative. By doing so, the university acknowledged the need to provide courses that offer HKU students with the core communicate competences that are so important nowadays for their creative, economic and social success both on campus and in the workplace.

One of the University's educational aims for undergraduate curricula in HKU is to enhance and promote communication and collaboration among students. And it is exactly here where CiC outshine conventional courses. By implementing Communication-intensive practices in learning environments, students are consistently and constantly provided with opportunities to communicate effectively in academic, professional and social settings. Furthermore, in Communication-intensive courses, students continually work with others and learn how to make constructive contributions in group work.

Currently, HKU students' communication skills are addressed in three types of courses, namely language enhancement courses, common core courses and professional communication courses. With the introduction of the CiC scheme, all the aforementioned courses will be labelled as CiC courses. These courses are also called CI-badged courses and consist of a syllabus with components that explicitly develop communication-related knowledge, skills and attributes. Every CiC course must include communication-related course learning outcomes and communication-rich assessments and learning activities.

Requirements of CI-badged Courses

For a course to be CI-badged, it must contribute to the development of students' communication related knowledge, skills and attributes in at least two of the following four literacy areas.

Oral literacy: the ability to communicate through spoken texts that are constructed with the appropriate content, structures, and language features, fit for their intended academic or professional purposes and audience. These are some examples of practices or activities teachers may use in lessons to enhance students' oral communication skills: debates, simulations, role-play activities, teacher/student-led discussions, online training sessions/workshops, peer feedback, etc.

Written literacy: the ability to communicate through written texts that are constructed with the appropriate content, structure and language features, fit for their intended academic or professional purposes and audience. This could be achieved with written tasks in the form of blogs, journal entries, discussion boards, analysis of sample texts, etc.

Visual literacy: the ability to communicate in speech and writing through appropriate visual modes (e.g., diagrams, graphs, charts) and/or visual media (e.g., posters, 3-D printed objects, stage performance). Some activities teachers might be already using or may want to incorporate into their teaching include, but are not limited to, storyboarding, live/video lecture, early draft/planning, analysis of sample visuals, hands-on learning of software, teacher/student-led discussion of visual design, etc.

Digital literacy: the ability to use appropriate information and communication technologies to search, evaluate, create, and communicate information in speech and writing (e.g. wikis, websites, virtual reality projects). The options are many, teachers could better their student's digital literacies by giving them opportunities to have storyboarding, live/video lectures, online training session/workshop, analysis of sample websites/videos, learning software (e.g., Audacity), etc.

Moreover, teachers must assign at least 40% of the course grade to communication-rich assessment tasks. Students' expected learning outcomes will be described in the rubrics of the communication-rich assessments. The formative and summative assessments will be adopted in the courses and feedback will be given timely and effectively.

CiC Badge Symbol in Students' Academic Attainment Profile

Students can check whether a course is CI-badged or not by logging into the student information system (SIS) and searching for the course in question. A CiC symbol can be found next to the course title in their academic transcripts. As a result, students, teachers, and employers have access to data regarding the number of CiC courses a particular student completed to get an idea of his or her communication training.

Support from the CiC Committee

Course coordinators are not alone when implementing and delivering CiC courses in HKU. They are supported by the CiC committee in the following ways: short workshops, curated online resources and materials development.

1) Short workshops/lessons on an aspect of writing/speaking/visual/digital communication (e.g., workshop on paraphrasing, audience awareness, using voice effectively, video editing, webpage design etc.). Workshop length is negotiable and depends on availability and lesson objective.

2) The Committee can create a website that contains links to our database of online tutorials and/or learning materials. For example, if teachers want their students to learn video-editing skills, the Committee can create a website that has a list of video-editing online tutorials.

3) There is a consultation service the Committee provides, which is ideal for those who prefer to teach communication elements in their courses themselves. If teachers need ideas on how to teach an aspect of communication or create communication-related teaching materials, they can seek assistance from the Committee.

Case Study: CBBA 9002 in 2021-22

Taking my course CBBA 9002 (Practical Chinese for BBA(IS) Students) in 2021-22 as an example, which students majoring in Business and Information Systems must complete this Chinese language enhancement course to fulfill the graduation requirement, the benefits of CiC courses are more than apparent.

The main objective of this course is to promote the professional use of Modern Chinese in the fields of business and information technology (IT). The course focuses on two areas of

literacy, oral and written. It familiarizes students with traditional and simplified Chinese characters, business and IT glossary, modern Chinese grammar and rhetoric, equips them with the ability to correct wrongly written characters, and requires from them to compose practical Chinese writings through outcome-based and communication-rich assignments and an examination. Special communication training (e.g., lectures, tutorials, guest workshops) that is intended to sharpen students' presentation skills is also provided.

At the end of the course, students are able to: simplify complex business and IT concepts for the general public; use appropriate features of language to convey meaning to the target audience; present ideas logically, concisely and professionally with cultural sensitivity; provide constructive feedback to peers; respond to constructive criticism from the teacher; improve the quality of their spoken and written communication in response to constructive feedback; present with confidence and in a concise, organized and articulate way; and be collaborative and open-minded to diverse perspectives. All the aforementioned abilities are those of an effective communicator.

Looking at how the course was taught in previous year, subject knowledge was clearly the main content of the course. For example, grammar of Modern Chinese language, correction of wrongly written characters, and traditional and simplified Chinese characters and comparison of Cantonese and Mandarin were all subjects solely focused on knowledge acquisition. In traditional classrooms, the general expectation is for students to attend lectures and later submit assessments that aim to solidify and strengthen the knowledge gained in class.

In my course 2021-22 schedule, we can see how, in some sessions, students can learn through the delivery of a CiC component and how, in other sessions, the content did not qualify as CiC ready. A similar trend can be observed in terms of tutorials. The following paragraphs offer a more detailed description of how my course addresses CiC components and tutorials.

First, in regards to CiC components, students enhance their communication skills by attending a guest workshop on presentation skills in the workplace. In the workshop, students develop specific communication skills with the help of two experienced media workers. They are asked to apply relevant communication strategies and deploy acquired presentation skills through in-class speaking practice, consisting of impromptu speech and a master of ceremonies role play. Students then receive comments and feedback from the guests, teachers and peers. In another lecture called "Business Writing", students discuss, analyze, and compare business and IT articles using communication tactics. They, among teachers and peers, make logical comments and constructive criticism on real examples of practical writing (e.g. memos/letters/proposals).Furthermore, they integrate appropriate technical terms from the fields of business and IT, aiding themselves with glossaries prepared by teachers and from relevant websites. Moreover, relevant terms must be used in their oral presentations and written reports, where they combine knowledge of the Chinese language with knowledge of the disciplinary subject by analyzing selected business and IT articles from Hong Kong, Taiwan and mainland China.

Second, concerning tutorials, a workshop for preparing context-based project is facilitated. Additionally, students hold in-class group discussions about the presentation topics. Proposals are drafted in class and feedback is given by teachers and peers. In two tutorials, students in groups give an oral presentation, making use of the presentation skills taught in class and present a business and IT related proposal to the general public through visuals and

within a particular context (e.g. product launch / press conference). They demonstrate their questioning and answering skills and provide constructive criticism and feedback among teachers and peers once the presentations have been given. At the end of the course, students have to master the format, organization, language, and style of expression of the genes of promotional Chinese writings (e.g. posters/press releases), which are related to the presentation topics, to then exhibit the writings in class for comments and feedback. (Appendix A)

Regarding the assignments, students are required to design posters and produce videos for their context-based projects, for which they receive support from the CiC committee. For instance, the CiC committee can guide them in the process of designing posters, producing short videos, and finally uploading their projects to the assigned website, on which they can later receive and provide feedback among peers. "Students may also use technology to improve their ability to communicate…compared with in-person discussions, an advantage of electronic discussions is that the contributions of each participant can be documented." (Bryant, 2005).

Pre-Course and Post-Course Survey Results of CBBA 9002 in the Academic Year of 2021-2022

CiC courses enhance our students' communication skills, which can be demonstrated by the results of the surveys organized by the CiC committee and powered by Survey Monkey. A survey was offered to my students (11 respondents in a class of 14 students) at the end of the first and final lecture of my course in September 2021 and December 2021 respectively. Here are the findings of the study, divided into three main areas: students' self-assessment of communication competence, students' attitudes towards development of communication competence, and the course elements that students perceive to promote communication competence development. (Appendix B)

For the first area, students were asked to evaluate their oral, written, visual and digital ability both at the start and at the end of the course. They were prompted to do so by assigning a value ranging from 1-5, where 1 represented "extremely weak" and 5, "exceptional".

For the following two areas, they had to express their levels of agreeance with a number of statements. These levels were measured with a five-point scale, in which 1 accounted for "strongly disagree" and 5, for "strongly agree".

Once this data was collected, Cohen's *d* was calculated as the effect size index and was categorized into Negligible ($d<0.10$), Small ($0.10\leq d<0.30$), Medium ($0.30\leq d<0.50$), and Large($d\geq0.50$).

Deeper insights into the findings of each area can be found below:

Table 1 Students' self-assessment of communication competence

The results in this area showed a medium effect according to Cohen's *d* for oral, written and visual communication competence. A large effect was recorded for digital communication competence, which showed that most students felt a significant improvement in this area after taking this CI- badged course.

Table 2 Students' attitudes towards development of communication competence

The results in this area varied from negligible to medium in size in accordance with Cohen's *d.* A medium effect was recorded for two items. The survey showed that after taking this CI-

badged course, students attributed more importance to both their need of spending time to develop their communication competence and developing communication skills for their academic life. In addition, a small effect was observed for another two items. Namely, the students' belief that learning communication skills had lifelong benefits and their understanding that the development of their communication skills was just as important as the development of their subject knowledge. Lastly, a negligible effect was noted in the students' belief that developing communication skills was important in their future career. However, it is worth mentioning that this is mostly because students had already given this item a very high value in the pre-course survey.

Table 3 Course elements that could promote communication competence

In this area, a large effect was accomplished for all items but one. The latter only seeing a small increase. Again, it is important to remark that it was this item, namely the belief that teacher feedback helped students develop their communication competence, the one that had reported the highest value during the pre-course survey.

Of special significance was the increase seen in the students' idea that formal assessments had helped them to assess their communication competence level, growing from being the item deemed the least important in this area to being the second highest ranked item in the whole survey. Moreover, students stated that they had clearly understood the communication objectives of this course and expressed that they had had multiple opportunities within their course to develop their communication competence. Needless to say, the results of the surveys were more than satisfactory.

Conclusion

To conclude, one of HKU's educational aims for undergraduate curricula is to enhance and promote communication and collaboration among students. HKU's university educational aims and institutional learning outcomes for undergraduate curricula, one of the aims is communication and collaboration, which aims at enhancing our students' communication skills. At present, HKU students learn communication skills, by either taking language enhancement courses (English and Chinese), which are general and discipline-specific, selecting common core courses, which are cross-discipline, and some professional communication courses, which are discipline-specific. With the development of the CiC initiative, students will enhance not only their productive and creative skills in relation to the above literacies, but also their receptive skills to understand, interpret and critique texts. According to the CiC Committee's recent record (last updated on 6 February 2022), there are 30 faculty courses, 24 common core courses, 34 English enhancement courses, and 10 Chinese enhancement courses, for a total of 98 courses which have successfully attained CiC certification. Students can be well benefited from CI-badged courses which help them communicate effectively in academic, professional and social settings, while making appropriate use of available technology and working with others to make constructive contributions.

Appendices

Appendix A- CBBA 9002 21-22 Course Schedule

Course Schedule

Lecture

Session	Theme	CiC component
1	Introduction and Pre-course Test	
2	Grammar of Modern Chinese Language	
3	Traditional and Simplified Chinese Characters and Correction of Wrongly Written Characters	
4	Comparison of Cantonese and Mandarin	
5	Business Communication	
6	Guest Workshop - Presentation Skills in Workplace	✧ Develop specific communication skills from guests' sharing (e.g. media workers) ✧ Apply relevant communication strategies and deploy acquired presentation skills through in-class speaking practice: impromptu speech and role play of master of ceremonies ✧ Receive comments and feedback from guests, teachers and peers
7	Business Writing	✧ Discuss some business and IT articles ✧ Analyze and compare the articles with communication tactics ✧ Make logical comments and constructive criticism on the real examples of practical writings (e.g. memos / letters / proposals) among teachers and peers
8	Revision	

Tutorial

Session	Theme	CiC component
1	Grammar of Modern Chinese Language	
2	Traditional and Simplified Chinese Characters	
3	Comparison of Cantonese and Mandarin	
4	Business Communication	✧ Integrate appropriate technical terms in business and IT areas from the glossaries prepared by the teachers and from websites ✧ According to the presentation topics, relevant terms will be used in oral presentations and written reports ✧ Combine knowledge of the Chinese language with knowledge of the disciplinary subject by analyzing some selected business and IT articles from Hong Kong, Taiwan and mainland China
5	Workshop for Preparing Context-based Project	✧ In-class group discussions about the presentation topics ✧ Proposals will be drafted in class and feedback will be given by teachers and peers
6	Students' Presentation 1	✧ Deploy the presentation skills taught in class and present a business and IT related proposal to the general public through visuals and with the communicative competence in a particular context (e.g. product launch / press conference) ✧ Demonstrate questioning and answering as well as providing constructive criticism and feedback among teachers and peers ✧ Master the format, organization and language and style of expression of the genes of the promotional Chinese writings (e.g. posters / press releases) which are related with the presentation topics, exhibit the writings in class for comments and feedback
7	Students' Presentation 2	
8	Assignments' Feedback	

Appendix B- CBBA 9002 21-22 Pre-Course and Post-Course Surveys

Communication Intensive Courses

CiC Pre- & Post-Course Survey Summary Report 2021-2022

Course: CBBA Practical Chinese for BBA(IS) students
Pre-course: 11 respondents **Profile:** 11 local
Post-course: 11 respondents **Profile:** 11 local

A. Students' self-assessment of communication competence

Table 1
Summary results of students' self-assessment of communication competence

Items	Pre-course		Post-course		Effect Size
	M	SD	M	SD	(Cohen's d)
1 My oral communication competence (e.g., oral presentation, contributing to a discussion) is	3.00	0.45	3.36	1.03	+M (0.45)
2 My written communication competence (e.g., essay writing, report writing) is	3.00	0	3.45	1.04	+M (0.45)
3 My visual communication competence (e.g., poster design, creating an infographic) is	3.00	0	3.45	1.04	+M (0.45)
4 My digital communication competence (e.g., making a video, creating a website) is	3.27	0.79	3.82	0.75	+L (0.71)

Note: Students' communication competence measured on a 5-point scale (1= extremely weak to 5 = exceptional). Cohen's d was calculated as the effect size index and was categorised into Negligible ($d < 0.10$), Small ($0.10 \leq d < 0.30$), Medium ($0.30 \leq d < 0.50$), and Large ($d \geq 0.50$).

B. Students' attitudes towards development of communication competence

Table 2
Summary results of students' attitudes towards development of communication competence

Items	Pre-course		Post-course		Effect Size
	M	SD	M	SD	(Cohen's d)
5 I need to spend time developing my communication competence.	3.73	0.65	4.09	0.83	+M (0.48)
6 Developing my communication skills is just as important as developing my subject knowledge.	4.00	0.77	4.09	0.83	+S (0.11)
7 I believe that developing communication skills is important in my academic life.	4.00	0.45	4.18	0.60	+M (0.34)
8 I believe that developing communication skills is important in my future career.	4.18	0.60	4.18	0.75	N (0)
9 Learning communication skills is important because my ability to communicate is a lifelong skill.	4.09	0.54	4.18	0.75	+S (0.14)

Note: Students' attitudes measured on a 5-point scale (1= strongly disagree to 5 strongly agree). Cohen's d was calculated as the effect size index and was categorised into Negligible ($d < 0.10$), Small ($0.10 \leq d < 0.30$), Medium ($0.30 \leq d < 0.50$), and Large ($d \geq 0.50$).

Communication Intensive Courses

C. The course elements that students perceive to promote communication competence development

Table 3

Summary results of the course elements that could promote communication competence development

Items		Pre-course		Post-course		Effect Size
		M	SD	M	SD	(Cohen's d)
10	I clearly understood the communication objectives of this course.	3.91	0.30	4.27	0.65	+L (0.71)
11	I believe teacher feedback helped develop my communication competence.	4.09	0.30	4.18	0.60	+S (0.19)
12	I had multiple opportunities within a course to develop my communication competence.	3.73	0.47	4.18	0.60	+L (0.83)
13	Formal assessments helped me to assess my communication competence level.	3.45	0.67	4.18	0.60	+L (1.15)

Note: Course elements measured on a 5-point scale (1= strongly disagree to 5 strongly agree). Cohen's d was calculated as the effect size index and was categorized into Negligible ($d < 0.10$), Small ($0.10 \leq d < 0.30$), Medium ($0.30 \leq d < 0.50$), and Large ($d \geq 0.50$).

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Resources

https://cics.hku.hk/ (Communication-Intensive Courses, The University of Hong Kong.)

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Does Practice Always Make Perfect? A Study of Whether Psychotherapists Treating Older Adults Become More Efficient as They Gain More Experience

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The current longitudinal study investigates the effects of practice on the outcome of psychotherapy for elderly persons. It follows 4 psychologists for the first 143 clients of their professional lives to explore whether increased practice leads to better outcomes for their clients. The participating psychologists routinely monitor the effect of their work with different psychometric outcome measures and receive weekly supervision. The clients consist of 267 primarily elderly persons above the age of 65, who receive psychotherapy to improve their overall well-being. Well-being is measured with the WHO-5 Well-being Index. Regression analyses, with outcome improvement functioning as the dependent variable, were calculated as pre-treatment scores subtracted from post-treatment scores. There was no significant effect of the chronological rank of clients on the overall effect of treatment. Hence, no practice effects were found in terms of increased well-being. Variations in effect did not change either. However, the psychologists used significantly fewer sessions to achieve the same effect as time went on, as there was a significant effect of the chronological rank of clients on the number of sessions. Though significant, the size of this effect was small. Results are discussed in the light of the literature on expertise and expert performance, and possible ways to increase the effect in psychotherapy with elderly persons are suggested.

Keywords: Psychotherapy, Elderly Persons, Practice Effect, Well-Being

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Introduction

Psychotherapy is regarded as a highly efficient treatment across many different types of psychological disturbances (APA, 2012). In most arenas of life, practice tends to improve performance considerably. Surprisingly, this does not generally seem to be the case for psychotherapists (Goldberg, Rousmaniere, Miller, Whipple, Nielsen, Hoyt & Wampold, 2016). For some reason, they do not appear to improve in terms of efficiency as time goes by - at least not unless they deliberately attempt to improve, for instance by applying systematic effect monitoring (Chow, Miller, Seidel, Kane, Thornton & Andrews, 2015). Some researchers have found that new psychotherapists display a significantly larger standard deviation compared to more experienced psychologists (Hougaard, 2019). This difference represents a larger variation in the outcome of treatment, which could be explained by the less experienced psychologists being less systematic. To our knowledge, the effects of practice has not yet been studied in psychotherapists working with older clients.

Methodology

The current longitudinal study investigates the effects of practice on the outcome of psychotherapy for elderly persons. It follows 4 psychologists for the first 143 clients of their professional lives to explore whether increased practice leads to better outcomes for their clients. Further, we investigate whether the number of sessions change as the psychologists gain more experience. The participating psychologists routinely monitor the effect of their work with different psychometric outcome measures and receive weekly supervision. The clients consist of 267 primarily elderly persons above the age of 65, who receive psychotherapy to improve their overall well-being. Well-being is measured with the WHO-5 Well-being Index which is a brief 5-item self-report inventory (Johansen, 1998; Topp, Østergaard, Søndergaard, & Bech, 2015). The following five statements are rated on a 6-point Likert scale with 0 indicating "At no time" and 5 indicating "All of the time": 1. *"I have felt cheerful and in good spirits"*, 2. *"I have felt calm and relaxed"*, 3. *"I have felt active and vigorous"*, 4. *"I woke up feeling fresh and rested"* and 5. *"My daily life has been filled with things that interest me"*. The respondents are asked to indicate for each of the five statements which is closest to how they have been feeling over the last 2 weeks. The WHO-5 raw score is calculated by totaling the answers to the five statements, ranging from 0 to 25, with 0 representing the worst possible level of well-being and 25 representing the best possible level. To obtain a well-being percentage score ranging from 0 to 100, the WHO-5 raw score is multiplied by four. Thus, the overall WHO-5 scaled scores range from 0 to 100, with 0 being the lowest possible level of well-being and 100 being the highest possible level. Scores of 50 and above are considered to indicate normal well-being. Scores of 35 or lower indicate severe stress and a great risk of depression (Danish National Board of Health, 2017). Regression analyses with outcome improvement functioning as the dependent variable, were calculated as pre-treatment scores subtracted from post-treatment scores. To account for individual differences in skill, the dependent variable was mean centered for each psychologist. The independent variable is the chronological rank for each client for each psychologist. As the investigated psychologists work within a deliberate therapeutic praxis, which utilizes systematic outcome monitoring, we expect to find a significant, but small, effect of practice on the outcome of treatment. Furthermore, variation in the outcome of treatment is expected to decrease as the psychotherapists gain more experience.

Conclusion

It turned out that there was no significant effect of the chronological rank of clients on the overall effect of treatment, R2 =.000, F(1,265) = 0.088, *p* =.767. The final predictive model was: Effect of treatment =.789 + (-010 * Chronological Rank). Hence, no practice effects were found in terms of increased well-being. As can be seen in the scatterplot (figure 1), variations in effect did not change either. However, the psychologists used significantly fewer sessions to achieve the same effect as time went on, as there was a significant effect of the chronological rank of clients on the number of sessions, R2 =.034, F(1,265) = 9.240, *p* =.003. The final predictive model was: Number of sessions = 7.729 + (-0.011*Chronological Rank). Though significant, the size of this effect was small.

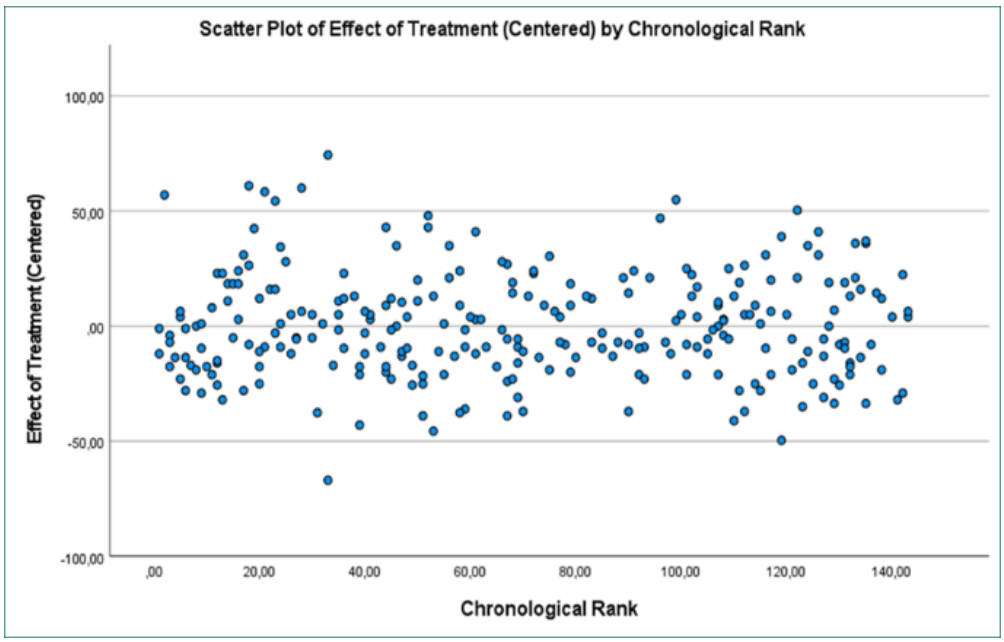

Figure 1 Treatment effect across time (increasing experience)

The psychologists at the Center for Quality of Life have demonstrated that psychotherapy is highly effective even when the psychologists are relatively inexperienced, demonstrating increases from a mean score of 33.89 to a mean score of 57 on the WHO-5 Well-being Index (Larsen, Mortensen & Vedel, 2020). Based on previous studies, we hypothesized that our psychologists, who receive systematic supervision, would show minor, but significant, improvements and that the variation in effect would decrease. Both hypotheses were falsified as no effect increase was found and the variation remained stable. However, the psychologists used significantly fewer sessions to achieve the same effect as time went on. The literature on expertise and expert performance shows that the amount of time spent specifically targeted at improving therapeutic skills is a significant predictor of client outcomes. Further, being a highly effective therapist requires more effort in reviewing therapy recordings alone (Chow, Miller, Seidel, Kane, Thornton & Andrews, 2015). Hence, a way forward for the psychologists in the Center for Quality of Life could be to focus more on improving effects in supervision sessions or alternatively to have group sessions for the psychologists specifically aimed at improving the effect of their psychotherapeutic efforts. Further, more time could be allocated to review therapy recordings individually. In the future we plan to implement such initiatives and follow up to see whether this will improve efficiency.

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Teaching and Iterative Improvement: The Impact of Instructor Implementation of Courseware on Student Outcomes

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Students need digital learning resources that will benefit their learning process, and educators need tools that provide meaningful data insights and can be integrated into their teaching practice. Courseware as a learning resource is designed based on learning science principles to optimize the learning process for students. However, it is also well-known that digital resources do not get optimum engagement on their own. The instructor's approach for implementation can have a sizable impact on student engagement—and ultimately—on outcomes. In this paper, we will compare two Psychology courses run in the Spring of 2020 and Spring of 2021 at the University of Central Florida. The courseware used was initially created by artificial intelligence and further enhanced by the instructor and instructional designer. The instructor taught both classes online using the same courseware, but made changes to how she implemented it. We will compare data from both sections to understand how these implementation changes impacted students—from platform engagement and learning data to student exam data. Results show that the instructor's implementation changes increased student use of the courseware throughout the semester, and also increased exam scores. This direct comparison showcases the importance of instructor choices when incorporating digital resources into the classroom and provides a set of successful implementation practices for other educators to model in the future. In a time of significant change in education, it is more important than ever to better understand how technology and teaching practice can work together to help students be successful.

Keywords: Courseware, Formative Practice, Learn by Doing, Student Engagement, Learning Outcomes, Implementation, Teaching Practice

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Introduction

Digital learning resources are changing educational ecosystems for students and teachers alike, offering new ways of teaching and learning and new insights into how learning works. Digital learning resources have also been the focus of research to determine how they can best support learning. For example, Carnegie Mellon's Open Learning Initiative developed and studied best practices for online learning (Lovett et al., 2008), providing the learning science foundation for the courseware used in this study. Yet for as valuable as the focus has been on developing high quality, effective digital resources for teaching and learning, there is still a great misconception that the resource itself could, or should, stand alone as a solution to teaching and learning. Kessler et al. (2019) noted, "research consistently indicates that instructional innovations are only as effective as their implementation." Implementation has been identified as a key component in effectiveness studies to understand how well an intervention performs in naturally occurring contexts (O'Donnell, 2008). Previous research on a courseware learning resource found that different instructor implementation policies for the same courseware greatly influenced student engagement (Van Campenhout and Kimball, 2021). The goal of this research paper is to analyze the impact instructor implementation practices had on student engagement in courseware used in an online Psychology course at the University of Central Florida, and the subsequent difference in student exam scores and course grades.

The digital learning resource used in this study is courseware—a comprehensive learning environment that combines textbook expository text, formative practice, adaptive activities, and summative assessments. Content is chunked into short lessons that are aligned to learning objectives and grouped into units. Previous research found that similarly designed courseware environments helped students learn more efficiently than traditional methods (Lovett et al., 2008). Additional features such as the adaptive activities have also been found to help struggling students increase their learning outcomes (Van Campenhout et al., 2020).

The primary learning method employed in the courseware is learn by doing: the inclusion of formative practice for each lesson of content. This approach creates the doer effect—the learning science principle that doing practice while reading leads to higher learning gains than just reading (Koedinger et al., 2016). Studied extensively at Carnegie Mellon, the doer effect was found to be causal to learning (Koedinger et al., 2016; 2018). The causal doer effect analysis was replicated in courseware on the Acrobatiq platform, confirming external validity of this learn by doing method (Van Campenhout et al., 2021a). The doer effect was also found to remain nearly unchanged even when accounting for prior knowledge and student demographics (Van Campenhout et al., 2021b), indicating its usefulness to all students. With the learn by doing method of courseware proven to generate the doer effect and found to cause better outcomes in a variety of natural learning contexts, we are confident in recommending that all students should take advantage of this learning approach.

The formative practice, adaptive activities, and summative assessments provide learning opportunities for students, but these features also generate data that is surfaced to the instructor in dashboards. Clickstream data are used to generate predictive learning estimates that drive the adaptivity for students and are surfaced in the dashboard to help instructors identify struggling students or challenging content. The data available to instructors makes it possible for instructors to closely monitor their students' progress, tailor in-class content, and evaluate learning concerns for individual students. The availability of this type of data for instructor use is a type of Course Signal, which has been shown to help improve retention in

courses and institutions (Arnold and Pistilli, 2012; Baker, 2016). Researchers have argued that proper utilization of both the educational environment and the learning technology should produce better results than either could produce on its own (Ritter et al., 2016). Providing instructors with tools to manage their class is second only to providing students with proven learning features.

Given the proven learning benefits of courseware, do all students take advantage of this resource when available? No. Student access to learning resources does not also mean they will use those resources as intended. This is not a novel concept. Research into textbook usage confirmed what many instructors experience: students did not use textbooks as intended (Fitzpatrick and McConnell, 2008). That same is true of digital learning resources; just because students have them doesn't mean they will all use them as intended without motivation. In a previous research study on engagement in courseware (Van Campenhout and Kimball, 2021), data were collected from 20 sections of a probability and statistics course across 8 institutions. The goal was to use the same courseware across a state-wide system of schools to ensure credit could transfer between institutions. Engagement in those course sections varied dramatically, even between instructors in the same department. The best predictor of student engagement was how the instructor chose to implement the courseware in their class.

In higher education, there are many models for teaching and learning currently being employed, even within the same institution. Whether face-to-face, online, or hybrid, in the majority of cases the instructor is still the architect of the scope, content, assessment, and grading policies for the course. The use of technology and learning resources in a classroom will always be context-specific. Therefore, the most direct and effective method for influencing student use of learning resources is the instructor and their approach to implementation.

Understanding instructor implementation is also critical in educational research. In a literature review updating and expanding previous research by Fullan and Pomfret (1977), O'Donnell (2008) outlines the state of implementation research in education:

Although seemingly well defined in the health literature (cf. Hansen, Graham, Wolkenstein, & Rohrbach, 1991; Kolbe & Iverson, 1981), fidelity of implementation is rarely reported in large-scale education studies that examine the effectiveness of K–12 core curriculum interventions, especially with regard to how fidelity enhances or constrains the effects of the intervention on outcomes (L. D. Dobson & Cook, 1980; NRC, 2004; U.S. Department of Education, 2006). Moreover, according to the NRC (2004), even less seldom is such a measure of fidelity to K–12 curriculum interventions used to adjust for or interpret outcome measures, (p. 34).

While O'Donnell's focus was on K-12 education research, the same is true in higher education. When considering how an intervention or new educational technology could impact student outcomes in any classroom, implementation matters. Fidelity of implementation is the extent to which "an intervention is implemented in comparison with the original program design during an efficacy and/or effectiveness study" (O'Donnell, 2008, p. 33). Implementation is therefore a natural component of effectiveness studies, where effectiveness is "the ability of an intervention to produce the desired beneficial effect in actual use" (Dorland, 1994, p. 531). In effectiveness studies, "variations in fidelity are measured in natural settings and then related to student outcomes" (O'Donnell, 2008, p. 42).

Given this relationship between effectiveness studies and implementation, we can see why these constructs are so important for research on educational technology. The courseware itself was designed using established learning science principles; the intention of the learn by doing method of integrating practice with learning content is to elicit the doer effect, which has been proven to benefit student learning outcomes. However, students will not benefit from the doer effect if they do not do the practice. By studying how one instructor changed implementation of the courseware between semesters, we can evaluate how the implementation can impact student engagement and outcomes, thereby evaluating the effectiveness of the courseware when implemented under different conditions. Our research questions for this study are:

- How did changing implementation practices of the psychology courseware impact student engagement between semesters?
- How did the change of student engagement with the courseware impact learning outcomes?

Methods

The Courseware

The courseware used in this study was initially generated by an artificial intelligence-based process called SmartStart (Dittel et al., 2019). This process uses an e-textbook as the corpus and applies natural language processing and machine learning techniques to identify learning objectives, divide the content into lessons aligned to learning objectives, and apply an automatic question generation process to create formative practice and feedback for each lesson (Jerome et al., 2020). For this psychology course, a Psychology of Sex and Gender (Bosson et al., 2019) textbook was used for the SmartStart process. The result was a base courseware learning environment that divided the textbook into objective-aligned lessons and included over 600 automatically generated (AG) practice questions. Previous research on SmartStart AG questions from six different courses used in natural learning contexts, including this Psychology course, found that students did not treat these questions any differently than the human-authored counterparts (Van Campenhout et al., 2021c). This large-scale AG question evaluation studied three performance metrics—engagement, difficulty, and persistence—and found no significant differences between AG and human-authored questions on any metric.

This generated courseware was then further enhanced by the instructor and instructional designer. Additional human-authored questions were taken from ancillary materials and added to the lesson pages as formative practice. This was primarily to increase the number of formative practice questions where necessary to be able to generate a predictive learning estimate within the platform. Summative assessments were also added at the unit level. Prior to the Spring 2021 course, the instructor also wrote questions to create scaffolded adaptive activities for the three most challenging chapters within the courseware. The adaptive activities had been shown to help students increase their learning estimate and benefited lower-performing students the most (Van Campenhout et al., 2020). The adaptive activities were also formative for students, providing immediate feedback and the opportunity to continue to try again.

The Implementation

The Psychology of Sex and Gender course was offered online to students (majors and non-majors) at UCF. Although there were students from all years present in each semester, more than 80% were juniors and seniors. About 60% of students were transfer students at UCF and 30% were first-time college students. It is also important to note that the student population at UCF is generally experienced with digital learning resources, including a variety of adaptive learning platforms.

Taught entirely online by the first author, an experienced faculty lecturer, this course was taught in a flipped-blended model where the courseware was the primary learning resource assigned to provide instruction as homework. The synchronous class sessions were designated for activities, discussion, and feedback. This flipped-blended approach has been found to be the most effective type of instructional model (Margulieux et al., 2015). This class was also a High-Impact (HIP) designated Service-Learning course. The first section of this course using this courseware ran in the Spring of 2020 (n = 119), meaning that this section was running when the COVID-19 outbreak first disrupted education globally. However, as this course was originally delivered online, no changes had to be made to its implementation. Students progressed through the remainder of the semester as expected. The second section of this course was run in the Spring of 2021 (n = 125).

There were many similarities in implementation between semesters. The course was delivered through a learning management system. The course was organized into weeks with specific instructions for assignments in each week. The courseware was linked to the learning management system through single sign-on so students only had to click the link to be taken to the assigned section of the courseware. Each week had reminders to do the assigned courseware section, and reminders were sent via email and during synchronous class as well. The course was specifically set up to provide as many opportunities to keep students on track as possible.

However, there were also differences in how the courseware was implemented between semesters. For the Spring of 2020 section, the formative practice completion was given a 2% contribution to students' overall grade. Students had to complete more than 85% of practice to receive their points, and this was evaluated at the end of the semester. Note this was for completion of practice and not first attempt accuracy of practice to retain the formative nature of the practice. The Spring 2021 section was still deeply impacted by the pandemic and this class was not a HIP designated Service-Learning course. The instructor continued to post three announcements per week but increased the focus on the adaptive courseware as a self-monitoring learning tool. Also, for the Spring 2021 section, changes were made to the scoring policy for the practice questions. For this semester, the practice questions were worth 20% of student grades, still with a minimum threshold of 85%.

Results and Discussion

The first type of data to look at is engagement data—how students used the courseware in each semester. In aggregate, students in the Spring 2020 semester completed 48% of practice, while students in the Spring 2021 semester completed 76% of practice. These practice totals include all students on the roster (even those who may have dropped) and all questions (even those on pages students may not have visited). A data visualization called an engagement graph can provide a more holistic view of how each class read and practiced in the course.

The engagement graph shows the number of students on the y-axis and the pages of the course on the x-axis. Attrition as the semester progresses is a natural and expected pattern. A vertical gap between the reading dot (blue) and the practice dot (red) is also typical, as there will usually be some students who read the page but choose not to do the practice available.

The engagement graph for Spring 2020 is very standard, if not above average compared to many other historical course sections (see Van Campenhout & Kimball, 2021). There is some general level of attrition over the entire course, as well as within units. Some students stop using the courseware over time. There is a gap between the reading and doing dots, indicating roughly five to ten students read the content but do not do practice. The assessment dots (green) are higher than the rest by about 20 students, indicating those students went directly to the assessment without reading the material at all.

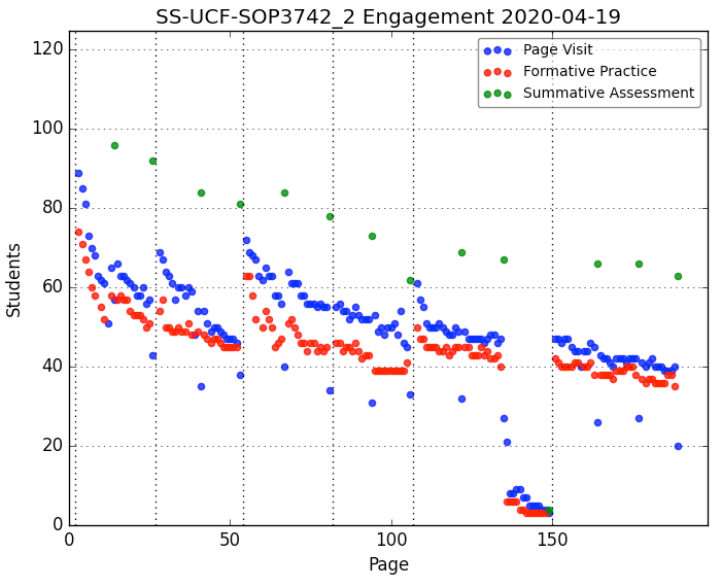

Figure 1: The engagement graph for Spring 2020.

The engagement graph for Spring 2021 shows a different pattern. While there is still some attrition, it is minimal over the duration of the courseware. Not only did nearly all students stay in the course, but the reading-doing gap is nonexistent. The reading and doing dots are together throughout the entire course. If we consider that an ideal engagement graph would be a horizontal line—showing all students reading and doing practice on every page—this Spring 2021 graph is very close.

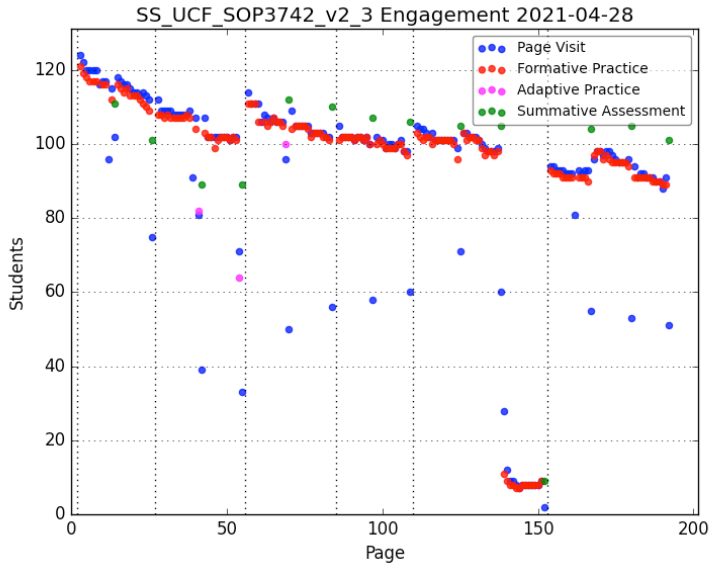

Figure 2: The engagement graph for Spring 2021.

Next, student exam scores can be compared between semesters. As seen in Table 1, student mean scores increased on each exam when using the adaptive version of the text. The Spring 2020 mean exam scores were several points higher than the Fall 2019 e-text baseline, yet the Spring 2021 mean scores increased even further. In Spring 2021, when the courseware was further incentivized and the personal practice was added to the most difficult chapters, test scores increased significantly.

		Exam 1	Exam 2	Exam 3
Fall 2019	Mean Score	60%	63%	71%
	Score Range	39–101%	12–104%	19–104%
	n Students	97	78	71
Spring 2020	Mean Score	70%	68%	78%
	Score Range	23–98%	24–104%	39–104%
	n Students	98	86	71
Spring 2021	Mean Score	77%	78%	79%
	Score Range	43–102%	42–102%	42–99%
	n Students	106	105	104

Table 1. Mean scores on the three course exams, 2019–2021.

These data revealed additional trends of note. First are the score ranges for the exams. With the exception of Exam 1, the lowest scores on the 2020 exams were twice as high as the previous year. Even more interesting is that the lowest scores for the Spring 2021 exams are even higher still, and nearly consistent at 42–43%. In addition to higher mean scores, the incentivized practice could have benefited struggling students and raised the lower bound of exam scores. This trend is worth additional investigation in future research. Another notable result from Table 1 is the number of students who took each exam across the years. The Fall 2019 and Spring 2020 courses have fewer students taking Exam 3 compared to Exam 1 (26 and 27 students, respectively). However, the number of students taking the Spring 2021 exams only decreases by two students. The high retention of students in the Spring 2021 course is also worth further investigation, as student retention is an important issue in higher education along with student learning.

Conclusion

There is unquestionable value in learning science research, as it reveals critical insights into how students learn and directs future research and development. The doer effect research, for example, quantified the benefits of doing practice while reading and revealed the causal nature of this relationship. Yet equally important is research into the application of these learning science principles to understand how they can be successfully implemented into classrooms and impact student learning outcomes. While the courseware used in this study was designed to engage students in learn by doing to generate the doer effect, this method will not benefit students if it is not used. Instructors have enormous sway over student engagement through their implementation of learning resources within the course. By comparing different implementation choices and the impact they had on student engagement and outcomes, we can add to the effectiveness research on how the learn by doing method in courseware can practically help students.

In this study, we can clearly see the effects of instructor implementation on student engagement with Psychology courseware between semesters. In Spring 2020, the courseware was the primary learning resource linked through the LMS and engaging with the practice was assigned 2% of the course grade. The engagement graph showed typical patterns of attrition over the course and a moderate percentage of students not reading or doing the practice. In Spring 2021, the instructor changed the grade percentage to 20% and the engagement graph shows very high reading and doing with very little attrition over the length of the courseware. While the instructor uses other strategies such as frequent LMS reminders, email updates, and in-class instructions, the change in participation points drove engagement up to near perfect levels. Students take course grades seriously and assigning points to the formative practice places a value on the learning content and process of learning while maintaining the purpose of the formative practice as just that—low-stakes practice.

What's even more meaningful for students was the shift in exam scores. The Fall 2019 scores were included as a control to provide scores using only the e-text. The Spring 2020 course using the courseware (the same e-text as courseware with the formative practice) saw an increase in mean scores for two of three exams over the previous year. The Spring 2021 course—in addition to the incentivized practice increasing engagement—had even higher mean exam scores than the previous year. These results confirm that implementation policies can increase student engagement in the courseware and ultimately exam scores. The learn by doing method has practical and meaningful implications for student learning and outcomes, and instructors can help maximize this benefit for students through their implementation choices.

Acknowledgements

We would like to acknowledge and thank Joe Lloyd and Linda Winer for their efforts on the development and implementation of this course. We also thank Benny Johnson for his feedback on this manuscript.

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Designing Outside of the Classroom: Branding Design for Thai Traditional Pottery

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
This research aims to develop branding for pottery products in Maha Sarakham, Thailand and to generate the collaboration between the local community and university. Ban Mo village, which is the community dedicated to pottery making, is used as the case study. This local wisdom has been inherited from ancestors for over 200 years, yet there is no definitive brand for Ban Mo Pottery products. To achieve this, 22 third-year students in Graphic Design at the Faculty of Architecture Urban Design and Creative Arts, Mahasarakham University were invited to work with Ban Mo community to help develop branding strategies that promote the sales and marketing of their products. 22 logo models were designed by 22 students. The research tool was a questionnaire examining key factors of branding development and rating the 22 logo designs. The target samples were collected from 40 members of Ban Mo Community. The results showed that Logo 9 was the most preferable logo for the Community's members. The illustration and product identity of Ban Mo Community were the key factors that the members used to select as their preferable logos. This suggested that the members preferred a simple logo with having the graphic design of local product identity on. In addition, the collaboration between local community and students creates a symbiotic condition, where the community benefits from the creativity offered by the students, while the students gain real-world experience working with clients to understand their process, goals, and needs. Also, placing students in these situations can help them better understand about their work, roles, and impacts on the business world as graphic designers.

Keywords: Brand Design, Local Product, Product Development, Pottery

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1. Introduction

The wisdom of pottery has historical evidence that is related to human life from the past to the present. This can be found from the excavations and studies of clay fragments by archaeologists, and this also arises from the natural human instinct for learning to invent, design and solve problems with art created from terracotta materials (Haaland, 2007). In the past, people mainly produced the pottery products (e.g., clay pots) for their convenience such as food preparation and storage (Heron and Evershed, 1993). The pottery products are also produced in connection with people's beliefs, religions, culture and geographical locations (Saunders, 2004; Haaland, 2007). These factors have still become an important element for pottery makers these days to create their work as it is seen today.

In Thailand, there are many areas where ancient pottery has been discovered from excavations. These pottery products have different patterns, styles and techniques according to the skill of the craftsman in different geographical locations. This wisdom has been transferred from generation to generation, creating the uniqueness of the pottery for each location and community. Baan Mo pottery community in Maha Sarakham Province is a group that has a long history in pottery making and has now become a source of learning about pottery (or in Thai called "Krueang Pun Din Pao") within the province and region. This community historically immigrated from "Non Sung" district, Nakhon Ratchasima province to "Nong Loeng" district, Maha Sarahkam province because of a long period of drought and severe epidemics. The majority of the households in this community are rice farmers. However, this location is enriched with a significant source of good clay and soil that are perfect for producing high quality pots. Since then, many households have started producing clay pots and other pottery products, and then it becomes commercial production. Therefore, the pottery has become a significant economic activity contributing to income generation for this community and province.

However, Baan Mo pottery products are still not popular in the domestic market, for both locals and tourists, because of lack of attractiveness and product identity (Tiwasing et al., 2018). Thus, Donaldson and Moore (2017) suggested that a good marketing plan can help promote a product more quickly. Farmer et al. (2013) emphasized that branding (or logo) is an important part of marketing strategies that can help to enable those products to be recognized. They also pointed out that branding plays a vital role in making a memorable impression on consumers, which potentially increases sales opportunities. Wang (2013) and Silayoi and Speece (2007) also supported that logos and brands play a crucial role in consumers' purchasing decision. It is often used as a marketing tool to communicate information to consumers and influence consumers' attention. Additionally, Tiwasing et al. (2018) studied the factors of branding design that influence the consumer perception on local agricultural product, which is jasmine rice, in Roi Et Province, Thailand. They found that the colors, fonts and illustrations that resented the identity of the local community and the product produced by natural methods (e.g., organic product) could significantly increase consumers' interests in this local product.

Yet, evidence of this research area in Thailand is still rather scant. There is a need to expand this research focus to help improve the marketing plans for local communities locally, nationally, and internationally. Therefore, this research aims to develop and design a unique brand (logo) for the pottery products produced by Ban Mo Community. To design the effective logos, the ideas and discussions from both members in the community and educational institution, namely Mahasarakham University, Thailand were integrated in the

graphic design processes. In this case study, 22 graphic designs were created by 22 students in the Graphic Design class at the Faculty of Architecture Urban Design and Creative Arts, Mahasarakham University to develop a unique brand (logo) for the pottery products of Ban Mo Community. The designs were then used in a questionnaire to ask 40 community members to rate each design on several parameters such as, colors, text, and so on. This helps to identify which logo designs are preferred and therefore would be the basis of a new brand image for the pottery in this community. Having a unique logo could help make this local pottery stand out and easy to remember. Also, it is important to preserve this local wisdom and at the same time to provide a channel to generate income for the community and expand the product to wider markets. More significantly, the research activity also recognizes the importance of students' engagement by allowing them to learn about the local wisdom and exchange their knowledge with the local community.

This paper is structured as follows: Section 2 presents the main objectives of this study. Section 3 discusses research framework including participants and research tool. The results are reported in Section 4, and Section 5 concludes key findings with suggestions for future research.

2. Objectives

This research presents the importance of the collaboration between the local community and university through the students' engagement. The main objectives of this study are:

1. To study the local wisdom of pottery from Ban Mo Community, Maha Sarakham Province.
2. To design a unique brand (logo) of the pottery products for Ban Mo Community, Maha Sarakham Province by the graphic design students from the Faculty of Architecture Urban Design and Creative Arts, Mahasarakham University.
3. To explore the community members' perception on the brand (logo) patterns designed by the students.

3. Research Method

3.1 Research Formwork

This research followed Gestalt Theory on the issue of visual perception and the issue of Perceiving Elements of Design (Principle of Design) (Bloom et al., 1956; Arneson and Offerdahl, 2018). Gestalt Theory is the principle that describes the recognition of the human eyes on visual elements, which aims to show how complex scenes can be reduced to more simple shapes (Wagemans et al., 2012). Figure 1 shows the research framework of this study. We started with the concept of product development by focusing on the development of physical goods and business and marketing processes (Krishnan and Ulrich, 2001). Then, we examined the importance of local wisdom of pottery from Ban Mo Community to understand their local knowledge and identity. Then, the obtained knowledge from Ban Mo Community was integrated with the concept of brand design based on key elements of the visual perception from Gestalt Theory. At this stage, the students had an opportunity to learn about the local wisdom and first-hand experience from Ban Mo Community, providing them with significant thoughts to design the specific logos for the local pottery based on their obtained knowledge. We then applied this key information such as colors, fonts and so on through graphic design to develop the unique logos or brands for the local pottery.

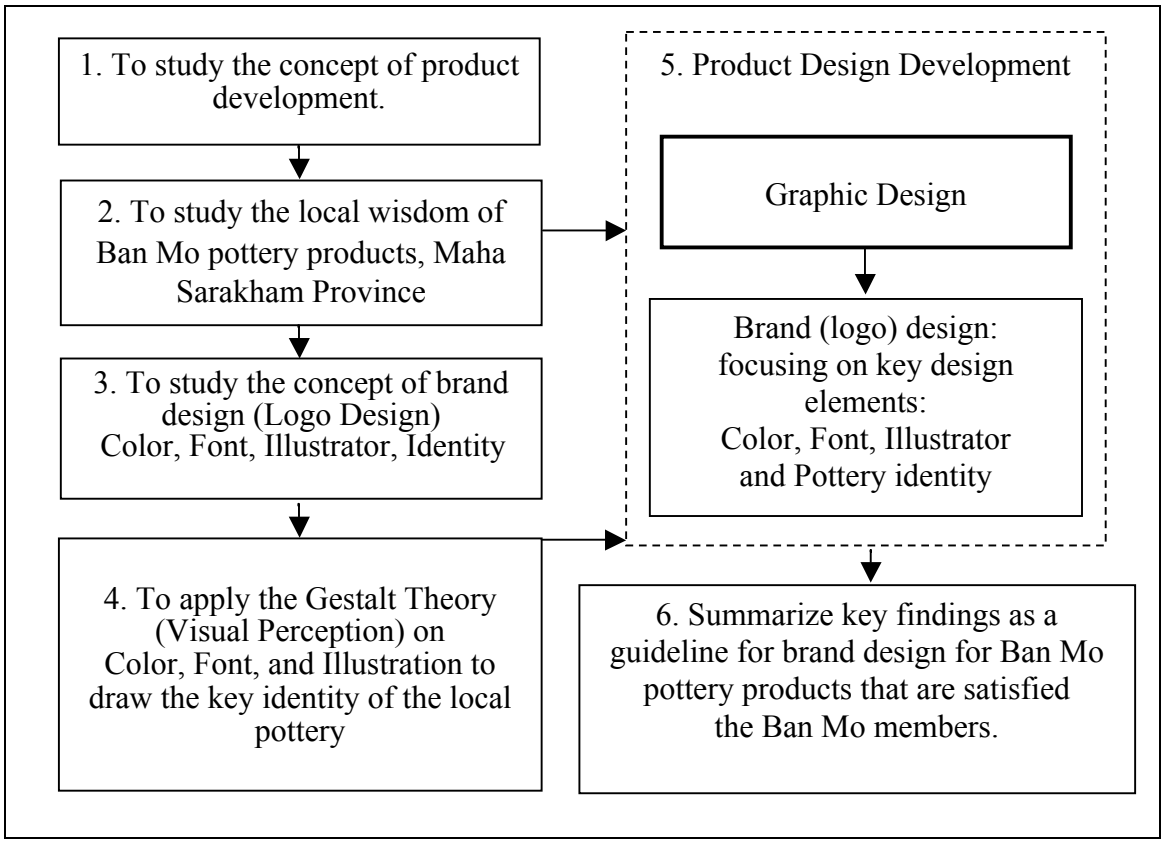

Figure 1: Research framework

3.2 Survey Participants

Following Gubrium and Holstein (2001), we firstly applied the focus group format to discuss the background, history and key knowledge of the local pottery with selected members of 40 persons from Ban Mo Community, Maha Sarakham province. Based on the obtained information, 22 students in the major of Product Design from Faculty of Architecture Urban Design and Creative Arts at Mahasarakham University designed their own logos. Then, we asked the selected members about their perception on 22 logos designed by 22 students (See Appendix). For the selected members, 37 persons are women and only 3 persons are men. The average age of the participants is 61 years old, ranging between 39 and 78 years. More than 50% of total participants have monthly income between 10,000 and 20,000 baht, which are considered as a low-income household.

3.3 Research Tool

Figure 2 details the research tool of this study, which is the questionnaire to ask about the satisfaction (and perception) of 40 participants from Ban Mo Community regarding the 22 brands designed by the students, who are a third-year student in the major of Graphic Design. The participants had to select the logos they liked most and then rated their preference on the key factors detailed in the 5-likert scale questionnaire.

Following the visual perception from Gestalt Theory, this study explored the design factors that affected the visual perception of the selected members of Ban Mo Community. The key factors used for the logo development through the graphic design in this study focus on 3 elements as follows:

- The perception on the key elements used to design the brand for the local pottery such as color, font and illustrator. We asked the participants to consider whether the colors, fonts and illustration used with the brand are appropriate or not.
- The perception and attitude towards brands of Ban Mo pottery products. We mainly focused on the attractiveness, uniqueness, and identity of the brand designed for the local pottery
- The general knowledge towards pottery products such as price of pottery products, variety of product styles, durability of products and so on.

Factors	**Logo 1-22**				
	Satisfaction level				
	5 Extremely Satisfied	**4**	**3**	**2**	**1** Not satisfied
1. The general knowledge towards pottery products					
1.1 Pottery is generally durable.					
1.2 Price of pottery is generally cheap.					
1.3 Pottery generally has a variety of styles					
1.4 Pottery can be found (or bought) easily.					
1.5 Pottery should be promoted to preserve the local wisdom for the next generation.					
2. The perception of brand elements is appropriate for pottery products.					
1.1 The colors used with the brand are appropriate.					
1.2 The font used with the brand are appropriate.					
1.3 The illustrations used with the brand are appropriate.					
3. The perception and attitude towards brands of Ban Mo pottery products.					
3.1 The logo brand is attractive.					
3.2 The brand has characteristics that are easy to remember.					
3.3 The Logo Design can communicate the identity of the Ban Mo Pottery Group.					
4. Conclusion of satisfaction towards the brand of Ban Mo pottery products					
4.1 The impression of the preferable brand you.					
4.2 Your preferable brand has a positive influence on the decision to purchase the pottery.					

Figure 2: the example of questionnaire for each logo

4. Results

In Figure 3, the results showed that more than 50% of Ban Mo Community's members chose Logo 9 as the most preferable brand, followed by Logo 10 and Logo 3 (15.0%) and Logo 12 and Logo 6 (7.5%), respectively.

No.	Logo	Percentage of satisfaction
1	 Logo 9	52.5
2	 Logo 10  Logo 3	15.0
3	 Logo 12  Logo 6	7.5
4	 Logo 22	2.5

Figure 3: The results of the most preferable brand selected by the members of Ban Mo Community

We also asked the participants about general knowledge on the pottery products. The key findings revealed that the members of Ban Mo Community were more likely to agree with the promotion of the local wisdom through pottery for the next generations with an average of 4.83 (Standard Deviation (S.D.) = 0.54), which was the 1st rank, followed by the variety of styles (average = 4.70, S.D.= 0.72), where to buy the pottery (average = 4.65 S.D.= 0.66), the durability of pottery (average = 4.55 S.D.= 0.67) and the pottery's price (average = 4.52 S.D. = 0.84), respectively.

For the perception on the brand elements, based on their most preferable logos, we found that the Ban Mo Community's members were satisfied with the appropriate illustrations or graphics used to design the brand with an average of 4.88 (S.D. = 0.33), which was the 1st rank. While the color and font used for the brand development were ranked 2nd and 3rd with an average of 4.75 (S.D. = 0.43) and 4.70 (S.D. = 0.46), respectively.
For the attitude towards brands of Ban Mo pottery products, we found that the community's members were satisfied with having the brand that best describes the identity of Ban Mo

Community on logo as the 1st ranked, with an average of 4.88 (S.D. = 0.33), followed by the brand that is interesting (average = 4.78, S.D.= 0.42) and the brand's uniqueness (average = 4.75, S.D. = 0.49), respectively.

In this analysis, we also used the participants' perception on the designed brand to consider the marketing opportunities. The result showed that the members were likely to agree that their preferable brand has a positive influence on the decision to purchase the pottery, with an average of 4.83 (S.D. = 0.38).

5. Conclusion and Recommendations

This research aims to develop a unique brand (or logo) for the local pottery products using Ban Mo Community in Maha Sarakham province, Thailand as the case study to increase the market opportunity for local pottery products. Using the questionnaire together with the brands (or logos) designed by the students in the major of Packaging Design at Mahasarakham University, Logo 9 was rated by the Community's members as the most preferable logo, followed by Logo 10 and Logo 3. The illustration and Community's product identity were rated as the key factors for the selection of the preferable logos. These results suggested that the members of Ban Mo Community preferred a simple logo with having the graphic design of local product identity on the logo. In particular, Logo 9 is only in black and white which may not be attractive to customers when compared to Logo 10 and Logo 3. However, for the producers' perspective, this logo is very simple to produce, and it could help reduce the production cost regarding printing and graphic design services (Chen et al., 1997). This unique brand could also help increase sales and market opportunities and expand the local pottery of Ban Mo Community to the wider markets. Also, this could help generate more income for the Community's members. However, to understand the full marketing process, we recommend future research to further investigate the consumers' perception on the designed brands for local pottery in order to design the best and effective logos to meet both producers and consumers' satisfaction.

In addition, this research emphasizes the importance of the collaboration between the local community and university through the students' involvement. This collaboration creates a symbiotic condition, where the community can benefit from the creativity and graphic design knowledge offered by the students. At the same time, the students can gain real-world experience working with the local community as clients to understand their process, goals, and needs. Also, working in these situations can help the students to better understand about their work, roles, and impacts on the business world as graphic designers.

Acknowledgements

This research was funded by Office of the Ministry of Higher Education, Science, Research and Innovation, Thailand. This research was grateful to the third-year students in the major of Graphic Design, Faculty of Architecture Urban Design and Creative Arts, Mahasarakham University, Thailand for their excellent work and engagement.

Appendix

The figure below shows the 22 styles of Ban Mo pottery products brand patterns designed by 22 3rd-year students studying in the graphic design. Faculty of Architecture Urban Design and Creative Arts Mahasarakham University Thailand.

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Designing and Teaching High Impact Culminating Core Curriculum Seminars Centered on Vastly Contentious Topics

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
This paper will engage the listener in the design and subsequent teaching of senior capstones based on global and contentious topics. At Mount St. Joseph University (MSJU), a liberal arts institution, the Core Capstone is a culminating interdisciplinary course with a three-fold purpose: (1) to facilitate substantial new learning about a complex global problem; (2) to encourage integration of knowledge, skills, and values from the entire liberal arts and sciences Core Curriculum, including experiential learning, to address that problem; and (3) to strengthen concern and action for the common good as habits of mind. The theme of the core curriculum is "The Common Good". The course development methodology is centered on the core curriculum learning outcomes and performance indicators. All course assessments are designed to evaluate the achievement of above learning outcomes. The paper will share the content modules of two senior capstones: CORE 472: Immigration: Achievements and Perils at the Core of Our Nation, and CORE 435: I Plead the 2nd! Examining the Role of Gun Violence in the 21st Century. Core 472 examines US immigration from a personal, historical, political, socio-economical, and psychological perspective. Core 435 examines gun violence from the perspectives of history, public health, public policy and discourse, economics, psychology, rhetorical analysis and crime prevention. Both courses are global in scope and their topics have become highly politicized in the United States.

Keywords: Interdisciplinary, Capstone, Current

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Introduction

In 2012 Mount St. Joseph University revised its Liberal Arts Core Curriculum with a permeating theme: The *Common Good,* first established in the freshmen seminar *Common Ground,* then thread through a multitude of different core curriculum classes, culminating in a core capstone.

At Mount St. Joseph University (MSJU) the *Core Capstone is a culminating interdisciplinary course with a three-fold purpose: (1) to facilitate substantial new learning about a complex global problem; (2) to encourage integration of knowledge, skills, and values from the entire liberal arts and sciences Core Curriculum, including experiential learning, to address that problem; and (3) to strengthen concern and action for the common good as habits of mind.* (Mount St. Joseph University 2021 Catalogue)

As a first generation immigrant to this country this writer is very familiar with the long, difficult process of obtaining permanent residence status and later US citizenship. Having lived through the lengthy process raised the interest in US immigration policy study from its beginnings to the current, and led to the development of:

Core 472: Immigration: Achievements and Perils at the Core of Our Nation

Since this course is taught in the accelerated format, students are required to complete a pre-assignment, ready to be presented during the first class period.

They have to choose a person who immigrated to the United States, research his/ her life and discuss his/her contribution to society. This could include their own family background or that of another important person in their life

The intent of the pre-assignment is to focus on the positive effects of immigration, in other words to set a tone of positivity from the very start. No matter where students go to receive their news, news on immigration in today's world undoubtable will have negative inundations.

Mount St. Joseph University is located in Cincinnati, OH, one of the largest German settlements in the United States and many of the attending students come from the Greater Cincinnati area. The German influence on Cincinnati culture is undeniable to this day. Thus it was feasible to begin the first module of the course by exploring German immigration to Cincinnati and study the contributions of German immigrants to the culture and Common Good.

Students learned about the three waves of German settlement and the reasons behind it. German settlers imported their love for clubs and societies; Cultural institutions such as the May Festival, the oldest choral festival in the US and he Cincinnati Symphony Orchestra were founded by German immigrants. At the same time, German settlers in Cincinnati formed the first trade unions in the nation. Trade unions worked for social justice such as the eight hour work day, public transportation, public education, etc.

German language instruction became part of the public school curriculum in Cincinnati. German Americans published two daily newspapers in the German language. Students were surprised to

learn that one could live in Cincinnati without ever having to speak English. German architecture is clearly identifiable among many public buildings, tenant homes, former beer gardens, and churches in the greater Cincinnati area. One cannot deny the tremendous influence German settlers have had on Cincinnati.

The topic of the second module is the treatment of immigrants in time of fear. Students studied what happened to German immigrants during and after World War I; the internment of Japanese-Americans after the attack on Pearl Harbor during World War II; the treatment of immigrants after 9/11 and beyond..

When WW I broke out in 1914, Cincinnati's German immigrants were deeply involved with local politics, namely the Prohibition. Cincinnati had more breweries, beer gardens, and pubs than any other city in the nation, and most were run by and employed German immigrants. In July 1915 Judge John Schwaab made the following statement: "the drink question is forced upon us by the same Hypocritical Puritans as over there are endeavoring to exterminate the German nation." (Tolzmann, p. 110.) This statement makes abundantly clear the deep cultural and political divide that existed between Anglican Americans and German Americans in Cincinnati at the beginning of the war. Students learned that German-Americans were politically active and outspoken; they did not support the democratic President Woodrow Wilson. This would lead to severe consequences after the United States entered WW I. Nativism dominated the political landscape in Cincinnati. Preachers expressed their point of view from the pulpit: "there are not enough telegraph posts in Cincinnati to hang all the Herman Huns that should be hanged." "I would rather kiss a pig than shake hands with a Hun." (Tolzmann, p.135) Students were surprised by this language, but were drawing connections to 9/11 and beyond. German language instruction was prohibited and on April 9th, 1918, Cincinnati City Council passed an ordinance to anglicize family, business, and street names. After the war German-Americans left Over the Rhine, settled in west side suburbs, and purposely did not pass the German language on to the next generation.

To understand what happened to Japanese Americans after the attack on Pearl Harbor, students read Julie Otsuka's *When the Emperor Was Devine.* In this short novel Otsuka expertly describes the physical and emotional experiences of an interned Japanese American family from the perspectives of the parents, the daughter, and the son. It begins with the mother's reading of the evacuation notice, her stoic acceptance of what needs to be done, her killing the family pets, and preparing the children for the trip ahead. It ends with the family's reunification after three years of internment, the father a broken man, not able to leave the house, the mother forced to clean other people's homes and washing laundry, because there were no opportunities for Japanese women, and the children wishing they were Chinese and once again accepted by their former school friends.

Additionally, students watched the PBS documentary *Time of Fear,* which includes original TV footage from 1942 and beyond. It provides rare commentary from interned Japanese Americans, who were children at the time. Now adults, their memory of the emotional impact of internment and the changes it brought to family life, are as vivid as if it had happened yesterday. Students are introduced to the Japanese concept of acceptance *Shikata ga nai,* it cannot be helped, and have an opportunity to see how Japanese Americans tried to achieve the best outcome from an

extremely difficult situation. The documentary clearly articulates the differences between Issei and Nisei, the first and second generation of Japanese Americans and the pressures placed on each due to the internment. Japanese American family life will be forever changed after 1945.

Further group discussions relates the treatment German Americans and Japanese Americans to immigration events that happened after 9/11 and in the present. Students are asked to choose articles they find relevant, summarize the content, and present it to the class as basis for discussion.

Module three's topic is immigration and the economy, the importance of push and pull. When do we allow immigration from certain parts of the world, when do we enact laws such as the Chinese Exclusion Act and why? What is the immigrant's contribution to the Common Good past and present? Students study a brief history of immigration laws in the United States and identify the fairness or unfairness of the same. In *The Devolution of US Immigration Policy: An Examination of the History and Future of Immigration Policy* Jeremiah Jaggers identifies four areas of immigration: "This article critically reviews four widely accepted eras of U.S. immigration policy (open door, regulation, restriction, liberalization). These eras are based on federal efforts to regulate and control immigration since the American Revolution until the twenty-first century. In addition to identifying salient historical, legislative, political, and social forces shaping immigration policy in each era, considerable attention is given to changes over the past decade. Modern realities have shaped what the authors propose as a new era of immigration policy (devolution), based on the significant social and legislative ramifications in the United States since September 11, 2001." (Jaggers, p.1) Students are asked to consider what future immigration policy might look like.

Module four covers immigration and political implications in the late 20th and early 21st century; the booming business of immigrant detention. Students are asked to ponder possible solutions for the current immigrant problems based on what they have read and believe might help correct the problem in the future. The basis for this module is the book *Killing the American Dream: How Anti- Immigration Extremists Are Destroying the American Dream,* by Pilar Marrero. While written in 2012, the book still is very relevant in 2021. Marrero's analysis of why federal immigration reform attempts have failed since Ronald Regan in 1986 and the consequences thereof is superb. Marrero explains the failure of the 1986 federal attempt at immigration reform, namely Reagan's Amnesty Law as follows: "The Amnesty Law legalized and integrated a million people into American society, but it failed to create long term mechanisms for hiring foreign workers in the industries that would most need them according to fluctuations in the economy…As long as there is no simple, effective immigration system with sufficient numbers of work visas in place, no amnesty, no matter how broad, and no border wall will block the flow of 'illegal' immigrants if the country continues to hold out its most precious treasure: a job, and a chance to succeed." (Marrero, p.17)

In order to expand student's perspectives they are asked to study the last federal attempt at immigration reform, Bill Clinton's immigration law of 1996. "The immigration law of 1996 was the most stringent legislation of its kind in modern US history. It reduced judicial review, deportations and detentions were increased, the options for asylum seekers were restricted, and it

required citizens who sponsor immigrants to prove they could support them if need be." (Marrero, p.33)

Students study the effects of 9/11 and the radicalization of anti-immigrant laws that followed; they learn that immigration policy was re-defined and became a question of national security; they become aware of the nativism/hate movement towards immigrants that followed 9/11 and is still apparent today.

With no federal move towards immigration reform, individual states take immigration law into their own hands. Students study the effect and consequences of SB 1070, also known as the Arizona Law, and HB 56, the Alabama Law. Both laws require police officers to check the immigration status of anyone at a routine stop. Local police have direct connections to ICE, the Immigration and Custom Enforcement, and if police find an undocumented person, ICE will ask the local department to hold that person until s/he can be moved to a detention facility. The documentary *Lost in Detention* examines President Obama's tough immigration enforcement and helps students understand the consequences of mass deportation, particularly on the families and children of deportees. Originally initiated to remove undocumented men and women who had committed a felony, ICE is now expected to deport 400,000 human beings per year, in order to not see the organization's budget cut. Students also learn the conditions in those detention centers; many are run by private prison management companies. They are overcrowded, with very limited space for deportees, who might have been shipped to the facility from a different state, without knowledge of the family back home.

It is essential to understand why people might enter the US without the proper vetting and paper work to begin with, particularly young children, who come to this country by themselves. The HBO documentary *Which Way Home* plays an important role in that leaning experience. It follows the travels of several boys and young men from South America and Mexico, who try to reach the US by jumping on freight trains. The film explicitly highlights the dangers of riding the trains, escaping the gangs who want to rob/kill the migrants, and the few people who try to help them along the way with what little food or water they might be able to spare. Additionally, the documentary illustrates the extreme poverty and horrendous living conditions these youngsters are fleeing from. For the most part students are aware of what poverty looks like in the US, but most have never been exposed to the kind of poverty that exists in some Latin nations.

Lastly, students study the history and subsequent failure of the Dream Act, discussed in *Killing the American Dream* and brought to life in the documentary *The Dream Is Now.* What should be done with the young undocumented immigrants who were brought to this country by their parents as children? They did not have voice in the decision making process and most do not remember the country they were born in. They have been through the public school education in the United States, they feel more American than Latin. Would it not be to the American advantage to legalize them and allow them to become successful members of the workforce, paying their fair share of taxes and contributing to social programs, such as Medicare, and Social Security? Students investigate DACA (Deferred Action for Childhood Arrivals) and learn that President Obama's executive action allowed children who entered the country before the age of 16 and before June 2007 to receive a two year work permit and exemption from deportation. Students also realize the enormousness of the problem and in their final paper try to come up

with measures of reform that make sense to them. These have included the following: issue more working visas; expedite the immigration process; use ankle bracelets or other technology instead of detention while immigrants wait for their court date; work with private companies to create jobs in afflicted countries; make the Deferred Action for Childhood Arrivals (DACA) permanent.

CORE 435: I Plead the Second! Examining the Role of Gun Violence in the 21st Century

In preparation for the Naturalization Exam, the author studied American history and civics, including the Constitution and the Bill of Rights. These studies furthered an interest in the Second Amendment, particularly as related to gun violence and gun laws in the United States compared to other nations. Thus the idea of CORE 435: I Plead the Second! Examining the Role of Gun Violence in the 21st century was born.

During the first class period students watch the 2015 National Geographic documentary *Guns in America* and are asked to identify any issues they feel are problematic. The discussion that follows quickly generates a list of issues that will be studied more in depth throughout the course: the danger of semi-automatic weapons with large magazines; the differences between federal and state gun laws, which can vary greatly depending on geographic location and individual state gun culture; the militarization of police as it relates to weaponry in response to the weapons found in use on the streets. The documentary presents statistics and realistic footage about gun use in homicides, suicides, accidental deaths, and mass shootings. Students question the ways guns are sold at gun shows, the interpretation of "stand your ground laws" and "red flag laws". The documentary also introduces them to the ways the NRA lobbies and messages to its members. In short, the documentary serves as an excellent starting point, raising the issues for research and discussion in a methodical, un-emotional, and realistic fashion, without a partisan agenda.

The next module introduces students to the history of the Second Amendment.

A well-regulated militia, being necessary to the security of the free state, the right of the people to keep and bear arms, shall not be infringed,

Students learn that according to the historian and legal scholar Patrick J. Charles the Founding Father's understanding of the Second Amendment was the people's contribution to the communal greater good through the militia, not individuals acting alone. In fact it was not until the 2008 Second Amendment case *District of Columbus v. Heller* when the Supreme Court Justice Antonin Scalia interpreted the language of the Second Amendment to mean that it is the individual's right to bear arms, unconnected to a militia.

In his book *The Politics of Gun Control,* Robert J. Spitzer offers the following explanation for the use of militias: "Settlers found it necessary to band together to provide for mutual defense from foreign armies and hostile Native Americans. The reliance on part time militias, instead of a regular professional standing army, was based on two facts of life. First, the emerging American nation did not possess the manpower or resources to raise, finance, supply, or maintain a large professional army. Second, Americans shared a profound distrust of standing armies."

(Spitzer, p.35) Students learn that militias, while easily assembled, never had the success of today's national forces due to lack of training and discipline.

Students in the classroom represent the enormous cultural divide of the country as a whole when it comes to gun safety versus the ability to carry guns without the interference from the government. Gabor provides a logical argument that most people can agree with. "The truth is that no right is absolute. Even the freedom of speech, protected by the First Amendment to the Constitution, has its limits. We cannot make death threats against others, incite people to overthrow the government violently, pass on national secrets to agents from other countries, make false statements that defame others, or disseminate materials deemed to be obscene. Municipalities even limit the noise we can make, especially at night." (Gabor, p.264) Students are challenged to think about ways on how to find a balance between gun safety, and restraining gun violence while still supporting the Second Amendment.

In the next module students examine the role and power of the National Rifle Association (NRA). It was not until the 1920s that the NRA got involved in firearms legislation and political advocacy. In 1931 "Roosevelt called for a special session of the New York Legislature to strengthen the Sullivan Law. Roosevelt proposed an amendment that would effectively ban machine guns, turn over pistol permit authority from the state to local law enforcements, require pistol permit applicants to succumb to photographing and fingerprinting, and limit pistol permits approvals to a period of no more than a year." (Charles, p.198) The amendment became law. The NRA immediately expressed its condemnation, declaring it a violation of the Second Amendment. Student reactions to the Sullivan law usually include astonishment at the strictness of the law when compared to legislation in the 21st century

It goes beyond the scope of this paper to explain the incredible marketing drive and recruitment techniques employed by the NRA, but students learn about these in their readings and by watching the 2015 Frontline documentary *Gunned Down: The Power of the NRA*.

The film begins in Tucson, AZ with the gunning down of Gabrielle Gifford, 33 bullets fired, 19 victims, and six dead. President Obama is advised to take gun control off the table due to the great political cost. The NRA at the time was the most feared lobbying group in DC. The film continues with the gruesome mass shooting at Columbine High School in Littleton, CO: 188 rounds of ammunition, a bomb in the cafeteria, 13 dead, 23 wounded. Two teenagers had acquired their weapons at a gun show where background checks were not required. The NRAs tactic to install fear in people by stating that the government will take away their guns worked. After every mass shooting gun sales soar and the membership in the NRA rises.

The documentary continues with the attack on the Sandy Hook Elementary School in Newtown in 2011. The attacker used a Bushmaster semi-automatic. It took six minutes, 154 rounds to kill twenty children and six adults. The country was devastated and many people demanded change in gun legislation. Background checks at gun shows were considered. 91% of people in the US supported this. Wayne LaPierre, the chief executive of the NRA insisted that toughness was needed. He suggested that more rather than less guns should be deployed for protection and that teachers should be armed as well. Using the old playbook to install fear in the population, the new proposed bill failed; it came up short by 5 votes in the Senate.

Next, students study how guns may be used lawfully and what the consequences of such laws may be. Students are introduced to the Stand Your Ground laws, initiated in Florida in 2005, now adopted by 33 states.

Students watch footage and read about the Trayvon Martin case from February 26, 2012at the Retreat at Twin Lakes in Sanford, Florida. There had been numerous burglaries, thefts, and other crimes reported in the community since 2011. As a result the community created a neighborhood watch program and selected George Zimmerman, a resident, as program coordinator.

On the night above, Trayvon was visiting his father at Twin Lakes. He was wearing a hoodie to protect from the rain and was just coming back from a community store when he was noticed by George Zimmerman, out on patrol and armed. Zimmerman decided to pursue Martin, who was unarmed. It is not clear what started an altercation between the two, but Zimmerman shot and killed Martin, claiming it was self-defense. "The Martin case illustrates that homicide can be the tragic result of a combination of fear, racial stereotypes, the presence of firearms, and an aggressive style of policing. (Gabor, p.136) Gabor offers an approach for the prevention of violence. He cites Joseph Vince, the Director of the Criminal Justice Program at Mount St. Mary's University, who was asked to prepare a report for the National Gun Victims Action Council. Vince and his associates found that for a citizen to carry and, perhaps, use a firearm for protection in a stressful situation, training should include mental preparation, knowledge of the law, as well as expertise, skill and recertification to maintain the permit." (Gabor, p.141)

William Briggs, author of *How America Got Its Guns,* offers a comparison of guns and cars. He asks the following questions: "Why not register all firearms and license firearm users? Why not levy special taxes on firearms? How about a tax on ammunition without which firearms would be useless? What about accident and liability insurance? And if safety regulations can staunch the epidemic of automobile deaths, why not try analogous laws to reduce the toll of gun violence?" (Brigs, p.184) Currently, only Hawaii, the District of Columbia, Illinois, New York, and Massachusetts require a license with periodic renewal and a proficiency test.

To complete the module and gain an international perspective on gun laws, students are asked to write a paper entitled *Gun Culture around the World.* They are asked to compare and contrast the gun culture of developed and developing nations. The basis for the paper is a New York Times article from March 2nd, 2018 entitled: *How to Buy a Gun in 15 Countries.* Students are amazed at the results of their research. Many make mention of the fact that in Germany police are allowed to enter one's private residence unannounced to assure that the home owner's guns are stored safely in a gun safe.

In module five students study the effects of gun use for unlawful purposes such as homicide, suicide, unintentional deaths, and mass shootings. Additionally, they are introduced to what role physicians might play in preventing violence.

Gabor argues that unintentional deaths and injuries do not get the attention they deserve. People associate gun deaths with robberies, murders, and other crimes. He states: "Unintentional firearm deaths and injuries can take many forms. Children can shoot themselves, siblings, or friends believing a gun is a toy or is not loaded. Hunters can mistakenly believe that another hunter is

game. A gun that is dropped may discharge. Another scenario underscores the tragedies that can occur when firearms are kept at home for self-protection and individuals display errors in judgement." (Gabor, p.103) He continues with an example from Cincinnati, OH, published in the Washington post. "A Cincinnati father shot and killed his 14 year old son when the police said he mistook the teen for an intruder. Police told the Associated Press that the man thought his son had gone to school Tuesday morning, but the teen went back home. The man heard noise in the basement, grabbed his gun and went to check it out. Then police said, he got spooked and shot his son, string him in the neck." (The Washington Post)

This example hits home with students and discussion evolves around the storage of guns, training in gun safety, and better education.

To complete the module, students study the mass shooting at Marjory Stoneman Douglas High School in Parkland, FL, on February 14th, 2018 in detail. Two powerful speeches by one of the surviving students, Emma Gonzales on February 17th and March 24th of the same year, speak for themselves. They initiated the March for Our Lives movement, which is vastly documented on YouTube. The capstone students clearly relate to these high school students as is evidenced in the lively discussions that follow.

Next, students explore the business of guns. Most firearm companies are privately owned and not publically traded. The industry is highly secretive and it is not known how many guns are manufactured in the US or are imported annually. Additionally, in the 1970s Congress forbade the Consumer Product Safety Commission (CPSC) to regulate firearms and ammunition. Students react with surprise to this fact, fully aware that consumer products such as toys and even a hairdresser are regulated to protect consumers. "In addition, due to The Protection of Lawful Commerce in Arms Act, a law signed by President George W. Bush in 2005, gun manufacturers are protected from liability and cannot be sued when their products are used to commit acts of violence." (Gabor, p.195)

Students learn that gun shows are not only highly popular and profitable, they are also dangerously unregulated. To purchase a gun at a gun show, one only has to give one's address and age, no background check is required, and often the sellers are not licensed. This allows felons who are legally prohibited from owning guns, to buy and sell weapons. Additionally, "straw purchasers", people with a clean record, can go ahead and purchase firearms for those who would be ineligible or disqualified to do so. Walking through a gun show, it is apparent that the gun industry continuously pursues the extension of the weapons' market by cultivating new customers. One can find firearms specifically marketed to women as a means of protection. These weapons might be smaller or come in "feminine" colors. An additional marketing idea is to tap into the next generation, namely develop and sell firearms for children to be used in shooting competitions. New evolving marketing strategies being currently pursued center around America's racial and ethnic minorities. It appears that this market has been largely untapped and shows tremendous potential.

Additionally, students learn about the strong connections between the firearm industry and the NRA. Undoubtedly, the NRA until recently has been the most formidable and successful political lobby group for gun rights in Washington. This is clearly to the firearms industry's

advantage, and has resulted in large financial contributions to the NRA. A few NRA board members are executives of gun manufacturers. For example, Pete Brownell, owner of a firearms accessories company by the same name, is one of the NRA's board members.

Through readings, class discussions, audio and visual media, and research, students have been exposed to a multitude of materials from as broad of a perspective as possible as related to firearms. They are now being challenged to come up with possible steps to help solve the nation's gun violence problem. The resulting papers vary, depending on personal background, family history with firearms, or geographic location. However, most students agree that gun training is important for responsible gun use and storage. A wait period will assure that the purchase of a firearm is not based on an emotional outburst. Most students would like to see background checks for everyone purchasing a weapon, this would apply to gun shows as well. Some students would like to see a psychological test as part of the background check. Others mention universally mandatory gun storage laws and wish to see the renewal of the automatic weapons ban. Students agree that extra-large ammunition magazines should not be for sale to the general public, but possibly available at gun ranges. Some want to see a national licensing system for gun buyers and a national registry for all guns. These are just some of the proposed steps to gain control over the systemic gun violence in the country.

Conclusion

In conclusion, both of the discussed senior capstones have the potential to provoke and intensify the country's bipartisan division in the classroom. The selection and presentation of course materials thus is of utter importance. These materials have to speak for themselves without instructor input. Students need to know that their opinions are valuable as long as they can be supported by peer-reviewed facts. Equally important is the positive and engaging attitude of and presentation by the instructor. Student evaluations have shown that the learners leave the course with extended knowledge of the subject matter and new ideas they can share with family and friends.

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Supporting Mastery Learning Through a Multiple-Submission Policy for Assignments in a Purely Online Programming Class

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The Learning Edge Momentum (LEM) theory suggests that once students fall behind, it gets more difficult to catch up with the course material. It then becomes increasingly more difficult to connect new, higher-level concepts to those solid edges of knowledge with mastery of basic concepts. Learning for Mastery (LFM) acknowledges that students learn at different paces by allowing students unable to master tests the first time to catch up eventually. This paper describes how an online introductory Python programming course offered to business students followed a multiple-submission policy for assignments to support LFM. The multiple submission policy contributed to the students' mastery by encouraging individual practice and experimentation while also increasing the students' comfort level and confidence. The research attempts to find relationships between taking advantage of the multiple-submit policy and results of summative assessments. Qualitative data on students' self-reported progress per week is cross-referenced with quantitative data from the results of a regression analysis performed on LMS logs related to students' engagement with course material. Performance on summative assessments is used as the regression's dependent variable, and engagement with formative assessments in terms of the number of attempts and performance per attempt is used as the explanatory variable.

Keywords: Learning Edge Momentum, Mastery Learning, Online Learning, COVID-19, Python Programming, Multiple Submissions, Transactional Distance, Self-Efficacy, Scaffolding

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Introduction

Learning involving subjects such as basic computer programming, unlike other subjects, there seems to be a bimodal distribution or double hump of grades (Dehnadi and Bornat, 2006; as cited by Robins, 2010). The Learning Edge Momentum (LEM) theory, as proposed by Robins (2010), suggests that once students fall behind, it gets more difficult to catch up with the course material. It then becomes increasingly more difficult to connect new, higher-level concepts to those solid edges of knowledge with mastery of basic concepts. Learning for Mastery (LFM) acknowledges that students learn at different paces by allowing students unable to master tests the first time to catch up eventually.

Context

The authors of this paper are relatively new to teaching in tertiary education, with the students assigned mostly business management majors of the John Gokongwei School of Management of the Ateneo de Manila University in the Philippines.

In the specific case involving this study, the class covered an Introduction to Python Programming. Neither computer science nor programming may not necessarily be top of mind for the students involved. Informal survey responses at the start of the class show that while many students did have programming instruction exposure in senior high school, most of them already forgot what they took up.

In previous rounds of this class, whether online or offline, student performance in programming classes had been bimodal rather than a single-mode curve. Anecdotally, fellow instructors who have been teaching much longer than we have had also been observing the same thing, with one of them exclaiming that "in programming, it's either you know it, or you don't." This is consistent with the assertion of Dehnadi and Bornat (2006), that experienced programming teachers believe that there are at least two populations in initial programming courses. They give the following quote (Robins, 2010):

“All teachers of programming find that their results display a ‘double hump’. It is as if there are two populations: those who can, and those who cannot, each with its own independent bell curve.”

Motive

The current pandemic has forced the University to shift to online education. The shift included a mandate to use Canvas as the Learning Management System (or LMS) for the whole university. With the LMS, the researchers saw an opportunity to take advantage of data collection, asynchronous modes of course delivery, and a more accessible facility to manage the submission of assignments and tests. The bias for course design, as pushed by the University, was asynchronous because of the problems involving Internet access.

With the available technology tools, there was an opportunity to determine if the attainment of mastery can be deliberately supported through course policy and design.

Learning Edge Momentum

Previous work explains some of the anecdotal findings heard over time relating to the bimodal nature of programming class assessments and outcomes. Robins (2010) proposed the learning edge momentum theory to explain why there seems to be a bimodal distribution or double hump of grades in subjects like computer science and introductory programming courses. It's hypothesized that it gets more challenging to catch up with the course material once students fall behind. In reverse, it is somewhat easier to acquire additional related concepts from the domain for any successful learning at the start, where the fundamentals are established.

If the student already has the fundamentals mastered early on, then knowledge acquisition at the address will be much easier, hence the learning edge momentum. On the other hand, this structural bias is brought about by certain learning styles, and the inherent nature of the content, such as computer programming, will drive students to opposite ends of the performance spectrum.

Mastery Learning

Mastery learning is founded on the principle that all students learn differently but are all capable of learning well when given the appropriate instructional conditions. In addition, mastery depends on how well the teachers diagnose and correct the learning difficulties of the students (Amurao & Ilagan, 2021). “Teachers can teach so that all students *do* learn well” (Block & Burns, 1976). According to Bloom & Carroll (1971), mastery learning results in both cognitive and affective outcomes. Cognitive outcomes manifest in the students performing well on the subject as quantified by grades, while affective outcomes emerge through impact on the students’ outlook of themselves and the world. They are encouraged to believe that they are equipped to cope with challenges, which makes them more resilient and empowered to achieve mastery. This applies not only to classroom concepts but lifelong learning as a whole (Bloom, 1976).

Learning for Mastery Strategy

The Learning for Mastery (LFM) strategy is one of the approaches towards mastery learning. It is based on John B. Carroll’s (1963, 1965) model where he proposes that if students exert and are allowed the time they need to learn a concept to a certain level, they probably could. The degree to which students are able to learn is related to two main factors, which are time spent learning and time needed to learn the concept. Carroll further breaks down these two factors further:

1. Time spent learning is determined by:

a. The student’s perseverance, as defined by the amount of time the student is willing to give to learning the concept

b. Their opportunity to learn, which is defined by the actual classroom time allotted for learning the concept

2. The time needed to learn is determined by:

a. The student’s aptitude for the subject, which refers to the time they need to learn the concept under ideal instructional conditions

b. The quality of teaching instruction they receive and their ability to understand the instruction, which refers to the additional time they would need to learn the concept under less than ideal instructional conditions

Block & Burns (1976) relate all these factors in the following statement: "the degree of school learning of a given subject depended on the student's perseverance or his opportunity to learn, relative to his aptitude for the subject, the quality of his instruction, and his ability to understand this instruction."

From Carroll's model, Bloom designed the LFM strategy around addressing the teacher-dependent variables, which are the opportunity to learn and the quality of teaching instruction. Bloom's approach has 4 different components (Block & Burns, 1976):

1. *Defining mastery* by identifying the learning outcomes, preparing a final summative assessment to measure mastery of the learning outcomes, breaking down the course into smaller units, and determining what learning outcome each unit addresses.
2. *Planning for mastery* by outlining how the teacher will present the materials to the students, developing formative assessments for the end of each unit to gauge mastery level, and developing correctives for each item of the formative assessment. The correctives may consist of group sessions, individual tutoring, or other learning resources (e.g. textbooks).
3. *Teaching for mastery* by providing initial instructions, administering diagnostic-progress testing, certifying students with mastery, and correcting those without mastery for all units.
4. *Grading for mastery* by administering the final summative assessment and quantifying the students' mastery using grades relative to the learning outcomes set instead of the other students' grades.

Guskey (2005) further elaborates on the mechanism of planning and teaching for mastery in Figure 1. The end-of-unit assessments are formative because they provide the teachers' insight into the students' learning progress, which the teachers can develop action points from on a class and individual level. Once formative assessments are administered, it is crucial for teachers to diagnose the students' individual learning difficulties and provide corrective or enrichment activities as needed. If the correctives are given within the appropriate amount of time, they can help prevent minor learning difficulties which can later accumulate into major problems and hold the student back from achieving mastery. After the corrective procedure has been given, Bloom recommends that students take a second formative assessment with the same difficulty level and address the same learning outcomes. This gauges whether the corrective was effective in addressing the student's learning difficulty that was being targeted. If the student has achieved mastery for that unit, then they can proceed to the next one. For students who scored well on the first formative assessment and did not require correctives, they may be given enrichment activities instead to further their learning.

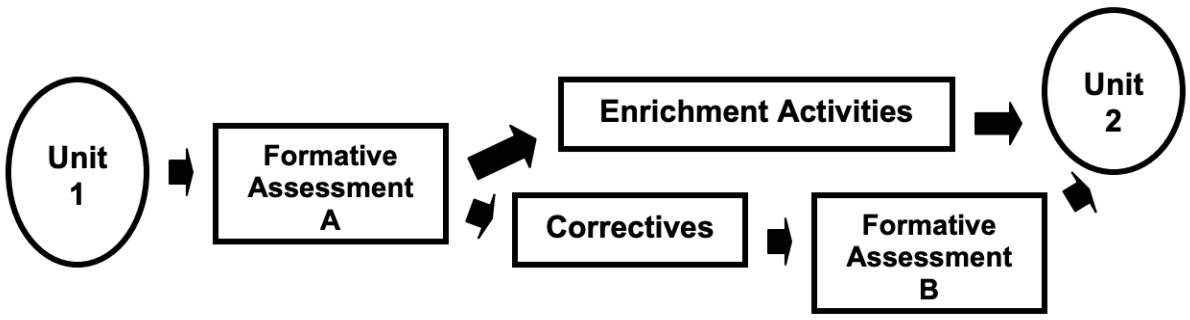

Figure 1: The Mastery Learning Instructional Process (Guskey, 2005)

Creative confidence is the natural ability to ideate and try new ideas. According to Kelley & Kelley (2012), reclaiming creative confidence means overcoming fears of the unknown, judgment, first steps, and lack of control. Fear of judgment relates to the concept of psychological safety, which is defined as "being able to show and employ one's self without fear of negative consequences of self-image, status or career" (Kahn, 1990). The presence of fear of judgment, or the lack of psychological safety, manifests when students censor themselves and share only ideas they perceive to be safe to avoid being judged by peers or instructors. A common quantitative measure of judgment in the academic setting is grades. If having a higher grade is emphasized over actual learning outcomes, students' fear of judgment worsens. As an effect, students may become set on the idea of just providing the right answer instead of learning through the process, avoiding difficult tasks, or avoiding asking questions and when they fail to overcome their challenges, they blame themselves and damage their self-esteem. The use of formative assessments helps address this problem because it helps teachers identify what the learning difficulty is and correct them (Black & William, 2010). In the case of there being more than one chance of answering the formative assessment, psychological safety is encouraged. Without the pressure of the first grade being the final one, students may take more risks when answering assessments (i.e. reduce self-censoring of ideas) and feel that they are able to achieve as they are guided in overcoming the students' individual learning difficulties.

Additional Theoretical Frameworks

Transactional Distance refers to physical (especially in distance learning), pedagogical and psychological gaps, particularly between instructor and student and among students (Moore & Kearsley, 2011, as cited by Ilagan, 2020).

Self Efficacy Self-efficacy refers to the belief of a learner to attain specific performance levels through behaviors needed (Bandura, 1977).

Given the online setting, guided by the theories of transactional distance and self-efficacy, there was the need to provide a healthy mix of structure dialogue and self-autonomy in the course design.

Research Questions

The overall direction of this study involves determining the relationship between deliberate course design to allow and encourage mastery and effects on learning outcomes.

RQ1) What is the general student attitude and behavior towards mastery if given the chance?
To arrive at the answer for this, we may have to ask the following: What is the average number of attempts before reaching mastery? For those who did not attain mastery, how many times did they submit/resubmit on average? What is the general summative score/grade distribution of those who choose not to achieve mastery?
those who achieve mastery? What are the earliest submission dates of those who achieved mastery and those who haven't?
RQ2) What is the relationship between mastery of learning attained during formative assessment and summative assessment outcomes? Determining the relationship between the number of submission attempts and summative assessment grading outcomes may help answer the question.
RQ3) What aspects of mastery can we actually target with classroom policies?

Methodology and Course Design

The study was conducted in the context of an introductory course to computer applications programming for undergraduate students called ITMGT 25.03: Information Technology Application Programming. The students who took the course were second-year Management Engineering students. Students of this profile are expected to be between the ages of 18 and 20, though the study was unable to obtain precise data to verify this and catch anomalies.

With clearance from the University's Research Ethics office, we sought student access logs and grades stored in the back-end Canvas server. Most of the quantitative insights aimed at addressing the research questions in this study came from the analysis of the logs.

Classroom Setup

In total, there were 81 students who took the course. The course timeline covered six calendar weeks from June 30, 2021, to August 8, 2021. There were six content modules in the class. The aim was for students to consume content at the rate of one module per week. The mode of course content delivery was fully online through text and videos hosted on the Canvas Learning Management System (LMS). Course assignments and assessments were written as Python Jupyter notebooks and were hosted on GitHub. The course did not hold any synchronous classes, although the instructors held consultation sessions on request. Summative assessments were conducted in time boxes, which means that students could only answer them during a designated period of time.

The main mechanism highlighted in this study is that the course's formative assessments could be submitted repeatedly by students until they got a grade with which they were satisfied. Due to the nature of the formative assessments (programming assignments on Jupyter notebooks), instructors could check submissions multiple times a day using automated grading scripts, which could also provide feedback to students quickly. It should be noted that the course's formative assessments did not use the gating approach. The formative assessments had no deadlines, unlimited submission attempts, and no forced order. This approach was chosen to promote psychological safety.

Findings

This study examines a subset of data available from the whole course from July 2 to July 14, 2021. July 2 was close to the start of the class timeline, and it was also the date that the course received its first formative assessment submission attempt. July 14 was one day after the first summative assessment, which was a departmental test. In this time window, there were two formative assessments: one of these formative assessments was introductory, and another was comprehensive (with respect to the fundamentals of programming). This subset was chosen to minimize the chance of interference of other factors with the behavior of students, as course mechanics were materially altered later in the class timeline to adjust for unforeseen events.

In this time window, of the 81 students who took the course, 61 eventually scored full marks on both formative assessments, and 20 did not. This distinction will be used as a proxy for whether a student "mastered" the subject matter. Using this indicator for mastery, it can be interpreted that the 61 students achieved mastery and that 20 did not achieve mastery.

There are notable differences between the engagement metrics of these two groups. On average, students who achieved mastery submitted both earlier and more often than students who did not achieve mastery. The following graph presents the cumulative average number of formative assessment submissions per group at any point in time. The students who achieved mastery submitted earlier and more often at every point in time over this two-week period than students who did not achieve mastery.

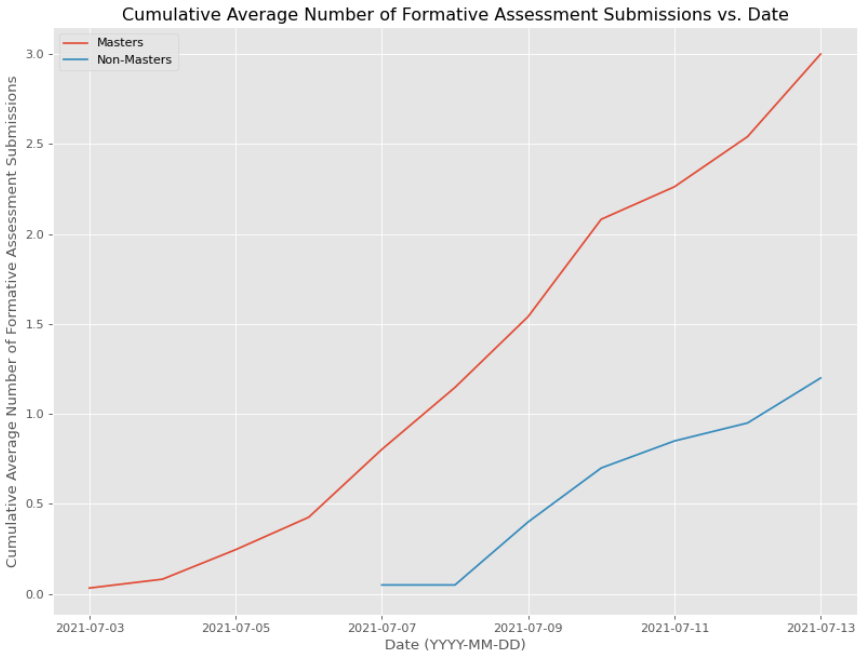

Figure 2: Cumulative average number of formative assessment submissions over the duration of the course

There are also notable differences between the performance metrics of these two groups on the summative assessment. In short, students who achieved mastery appear to have performed both better and more consistently than students who did not achieve mastery. To illustrate the quality of performance, out of 200 points, students who achieved mastery scored an average of 175 points, and students who did not achieve mastery scored an average of 152. Adjusted to the university's grading scale, the students who achieved mastery scored an average score equivalent to a B+, and students who did not achieve mastery scored an average score equivalent to a C+. To illustrate the consistency of performance, the distribution of the scores of the students who achieved mastery has a standard deviation of 25, whereas the distribution of the scores of the students who did not achieve mastery has a standard deviation of 42. The following graphs illustrate the visual distribution of the scores of both student groups. It is apparent that the graph of the scores of students who achieved mastery is left-skewed and concentrated near its mode, whereas the graph of the scores of students who did not achieve mastery is more spread out.

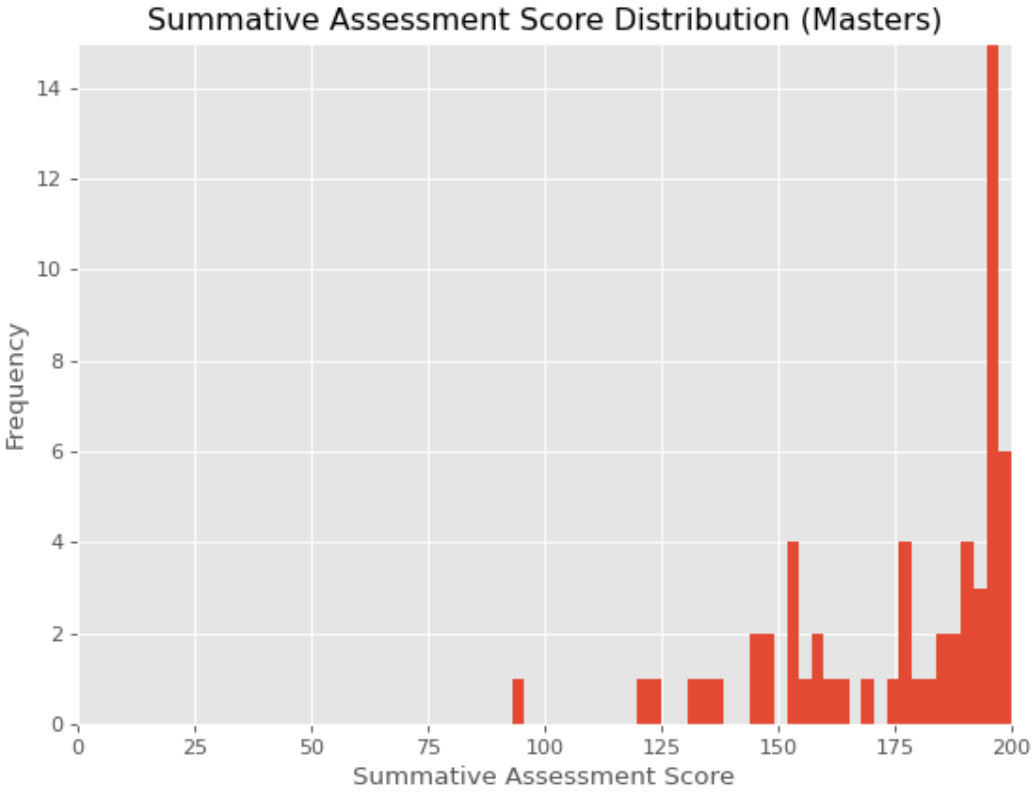

Figure 3: Summative assessment score distribution of those interpreted to have achieved mastery

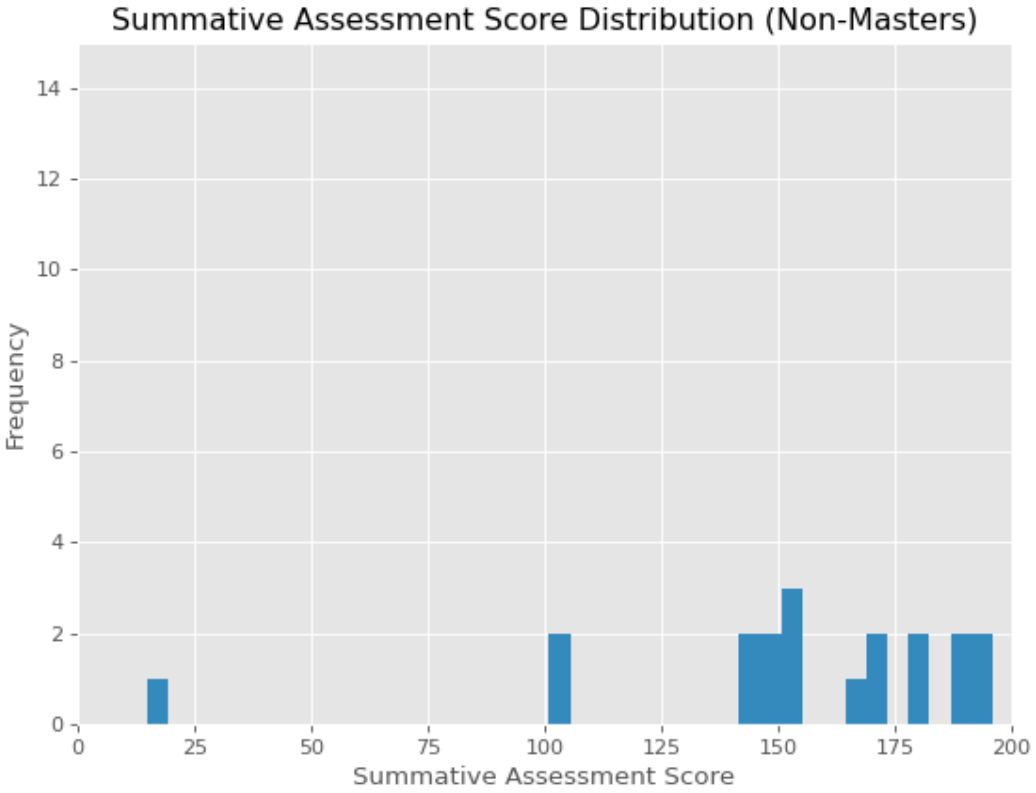

Figure 4: Summative assessment score distribution of those interpreted to not have achieved mastery

This study also explored two other potential explanatory variables for the difference in performance: first, the lateness of the first submission, and second, the number of submissions. The lateness of the first submission is moderately negatively correlated with performance, and the number of submissions is weak-to-moderately positively correlated with performance. However, neither variable explains a large portion of the total variance even when both are used in multiple regression.

In conclusion, there seems to be a difference between students who achieve mastery and students who do not achieve mastery. Students who achieved mastery performed better and more predictably than students who did not. However, elements of mastery seem to have not been captured by this study. The proxy variables for measuring mastery did not produce high R2 scores.

Discussions and Future Work

The introduction of course mechanisms to facilitate mastery learning was helpful but incomplete. Some students did not take advantage of the mastery learning facilities. With indication that there is a relationship between mechanisms for mastery learning and learning outcomes but also an understanding that there are remaining but unidentified factors inhibiting taking advantage of these mechanisms, what classroom policies are needed to maximize mastery learning?

Future work may consider conducting qualitative analysis on why students choose not to take advantage of multiple submissions. Succeeding studies (observation or experiment) may involve other sections of the same subject but not follow the multiple submission policy. Future course designs may also include submission mechanics to induce and encourage submissions as early as possible. It may also be worthwhile exploring the gating approach done by McCane, Ott, Meek, & Robins (2017). Finally, the possibility and significance of external help or, worst case, academic dishonesty, needs to be addressed.

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Students' Perceptions Toward Dyads and Triads in the English Classroom

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Collaborative learning such as pair work and group work, has been widely discussed and proven to be an effective tool for teaching English. This study exclusively focuses on a dyad (a pair) and a triad (a group of three), and the students' perceptions toward these collaborative interactions because few studies have investigated the difference between students' perceptions toward dyads and triads. Those psychological aspects could play an important role in promoting a student's learning English and motivation. Furthermore, triads are considered as a basic unit of a group which creates a sense of being public. This could have a unique effect on students' feelings. 57 Japanese university students introduced themselves in dyads and triads. The questionnaires were administered to collect the data. The characteristics found in each interaction are categorized respectively in accordance with the findings of research in clinical psychology. The research results indicated that how they experienced both dyads and triads differed, although they had a positive attitude toward both of them. While participating in dyads is the preferred format for conversational practice as the students could converse quite easily and contribute to the conversation, adopting triad interactions in English lessons may provide a double advantage to students: learning English, and learning communication skills and social skills. This could have some implication when teachers use pair work and group work in English lessons.

Keywords: Pair Work, Group Work, Interaction, Students' Perceptions

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Introduction

Pair work and group work have been frequently adopted in class as a collaborative way of activating lessons and facilitating English language learning. Previous studies have shown the effectiveness of pair work and group work (Fernandez, 2012; Sajedi, 2014; Moradan & Ahmadian, 2016). The present study exclusively focused on a dyad (a pair) and a triad (a group of three), and pshycological aspects because few studies have compared pair work and group work consisting of three people. Furthermore, triads are thought as a basic unit of a group. Having three people in a group creates a sense of being public and could affect students' reactions because in transitioning from dyad to triad interactions, students may recognize that they need to adapt according to the situation. In clinical psychology some researchers focused more on the students' feelings in an ordinary interpersonal setting and characterized some obvious tendencies in dyads and triads (Nagayama, 2018). This study investigates the students' preference for dyad and triad interactions and analyzes their perceptions and attitudes toward such in an English classroom setting. It proposes that an understanding of the students' psychological characteristics towards dyad and triad interactions, could enable teachers to better gauge students' perceptions when they are working collaboratively in the English classroom.

Literature Review

Group Work, Pair Work and Individual Work in An English Classroom Setting

A number of previous studies have reported the effectiveness of pair work and group work. In Tsumura (2013), university students with a low level of English who disliked English and initially had a negative view of pair work, were given the opportunity to work in pairs and consequently changed their opinion, stating that they enjoyed pair work and that they could learn collaboration from pair work. However, they also stated that they felt unease when partnered with a student who had a higher English ability. Sakamoto (2016) observed what happened between junior high school students when they worked on a writing task in pairs. During their discussions, affective factors such as a familiar relationship between the pair and feeling at ease with their partner, had an important impact on pair work. Fernandez (2012) compared group work, pair work and individual work. This research showed that texts written by pairs and groups were overall more accurate than those written individually and concluded that the effect of collaboration on accuracy may be related to the number of participants in the activity. In Fernandez (2013), the same collaborative writing task was used and learners' reactions were analyzed qualitatively. 55 university students were given a writing task in Spanish in both pairs and groups and subsequently answered a questionnaire about collaborative learning. 51 students expressed a positive attitude toward pair work and group work. The students who participated in the group work stated that they preferred group work to pair work because they received more knowledge from group members and had more opportunities to develop their target language. Furthermore, if partners and group members had the same level of language proficiency, there was limited opportunity to develop their language skills. A few studies have been done comparing the effectiveness of using dyads, triads and individual work in the language classroom. In Moradan & Ahmadian (2016), 61 Iranian English language students ranging in age from 10 to 13 were divided into three groups - two experimental groups (dyads and triads) and one control group (individual). All groups had storytelling sessions while the two experimental groups were also taught interaction and group work strategies. Pre- and post-tests were carried out by interview and the results showed that both dyadic and triadic interactions had positive effects on the

learners' oral proficiency, and that triadic interactions in particular, were the most effective. Sajedi (2014) also investigated the effect of dyads and triads on English language composition. 86 Iranian university students had collaborative summary writing in dyads, triads and individually. The results indicated that the number of participants affected the quality of their writing and pre- and post-tests revealed that dyads brought out greater scores on content, organization and vocabulary. Sajedi's study concluded that students in dyads did better than those who worked individually and in triads.

Group Work, Pair Work and Individual Work in Clinical Psychology and Computer Programmin

The idea of collaboration has been used in many fields. In clinical psychology, Nagayama (2018) examined how university students perceived dyad-triad interactions in ordinal face to face communication scenes. 140 students were asked to write their reactions when they talked in dyads and triads and their answers were analyzed by the Semantic Differential Method. The research revealed that while students tended to be more comfortable and at ease in dyads, they also felt challenged to keep the conversation going. Conversely in triads, the conversation tended to become more superficial and objective, as there is a sense of being in a more public setting when talking in triads. Yet they also felt at ease and the situation less intense, because the focus was not solely on them. Nagayama (2009) also compared the difference when a student engaged in a dyad situation and directly after, engaged in a triad situation. The students drew pictures to describe the subjective feelings in each case. The research illustrated that the subjective feelings were dynamically influenced by the number of people in interactions and the status of their relationship.

In computer programming, collaborative work has been used in pair programming. In Williams (2001), 41 university students in a Software Engineering class performed computer programming with their partner and also individually. 92 percent of the students said that they were more confident in their project when working with a partner and 96 percent of them said that they enjoyed the class work more when working with a partner. The results showed that pair programming also improved quality and reduced cycle time. Interestingly, programmers took pair pressure as a facilitator as they were highly motivated and did not want to let their partner down.

The effectiveness of pair work and group work has been verified by these previous studies in interdisciplinary fields. However, in order to derive the most advantage from collaborative work, it would be better to pinpoint affective factors which have a big impact on learning in an English classroom setting. Therefore, the present study addresses the following two research questions:

1) Which of the two interactions, a dyad or a triad, do the students prefer?
2) What views do the students have of dyad and triad interactions?

Method

Participants

This study was conducted in regular English classes. 57 second year students were enrolled in a lesson, English for Engineering, at an engineering university in Japan. The students were divided into two classes; one consisted of 21 students and the other 36 students. Their TOEIC score ranged from 265 to 990 (M = 438.6, SD = 122.2). 14 of the students had the experience

of living in a foreign country for a period ranging from two days to two months and two of the students lived in foreign countries when they were children for five to six years. Four overseas students from China and Indonesia were included.

Dyad and triad interactions

The classes were elective and consisted of students from several departments of the university. Therefore, some students met each other for the first time in class. Moreover, dyad and triad members were decided automatically by computer in each lesson, so generally the students had a different partner or group member. However, sometimes students had the same partners and group members due to absences which limited the class numbers. Based on these conditions, dyad and triad interactions were designed as an icebreaker at the beginning of each lesson, in order for the students to get to know one another and facilitate a smooth introduction to the lesson. The students introduced themselves to their partner or group members according to an interview sheet prepared by the researcher. It included 13 questions related to private matters, and one question about a topic in their engineering textbook. They were instructed to tell their partner and group members about themselves as though they were participating in a job interview in English. There was an added importance to this oral activity because it provided preparation for a possible real interview in the following year. They were given an interview sheet and were required to write a brief note about their partner or group members while talking with one another. They were also permitted to ask follow up questions if needed. Although the questions were set, how they asked and answered the questions and kept the conversation going, was decided by each individual.

Questionnaires

At the commencement of the course, a questionnaire was given to the students, asking general information such as their interest in learning English, their experience of pair work and group work, their extra-curricular study habits of English and any experience of staying in foreign countries. In order to collect their views on dyad and triad interactions in a qualitative way, the second questionnaire was conducted in the last lesson (Lesson 14), asking about their preference for dyad and triad interactions, and positive and negative points.

Procedure

At the beginning of each lesson, the students were given a seat allocation and had a new partner or new group members. The lesson commenced with a warm up conversation as an icebreaker. Using the interview sheet, each pair or group had a chance to get to know one another by introducing themselves and asking some follow up questions. When they had a dyad interaction, it took 5 to 10 minutes to complete the conversations and when they had a triad interaction, it took 10 to 15 minutes. During the conversations, they recorded some notes about their partner and group members on the sheet and after the conversations, they had a one-minute of reflection time to write their reflective comments on the sheet. From lesson 1 to 6, they had dyad interactions and from lesson 8 to 11, they had triad interactions. In lesson 12 which was the last chance for them to do this activity, they again had a dyad interaction. Their interview sheet was submitted to the researcher in lesson 12.

	Very much	Yes	Neutral	Not very much	No	No answer	Total
I like learning English.	3	11	25	14	3	1	57
I like pair work.	4	15	25	13	0	0	57
Pair work is helpful for learning English.	6	38	11	2	0	0	57
I like group work.	2	16	26	12	1	0	57
Group work is helpful for learning English.	5	30	18	3	0	1	57

Table 1 The first questionnaire

Results and Discussion

The first questionnaire

In the first questionnaire (distributed in lesson 1) the students were asked about their general attitudes toward learning English, pair work, group work and whether pair and group work were helpful for learning English. As evidenced in Table 1, 14 out of 57 students enjoyed learning English while 17 of them disliked it. 25 of them answered “Neutral”. This means that out of 57 students, 42 (17+25) stated no particular interest in learning English. Regarding pair work, 19 of them liked pair work while 13 of them disliked it. On the other hand, 44 of them thought pair work was helpful for learning English and only two of them thought it not helpful. In terms of group work, 18 of them liked group work and 13 of them disliked it. 35 of them also thought group work was helpful for learning English while only three thought it not helpful. It appears that they did not have a particular liking for pair work nor group work but they knew that both could improve their language learning. This may indicate that they may not have had enough opportunity to work in pairs or groups and that they might come to appreciate the collaborative work if appropriate pair work and group work were given to them.

The second questionnaire

Research Question 1

The second questionnaire was conducted in the last lesson (lesson 14). Firstly, as seen in Table 2, when they were asked whether they felt working in dyads was enjoyable, 28 of the 57 students stated that they enjoyed working in dyads while five stated that they didn’t enjoy it. Regarding working in triads, 25 of them stated that they enjoyed working in triads while seven of them stated that they didn’t enjoy it.

	Very enjoyable	enjoyable	Neutral	Not so enjoyable	Not enjoyable at all	Total
Working in dyads was enjoyable	3	25	24	4	1	57
Working in triads was enjoyable	3	22	25	6	1	57

Table 2 Students' preference for working in dyads and triads

	Dyads	Triads	Both	Neither	Total
Which was more enjoyable, working in dyads or triads?	26	25	5	1	57
Which do you prefer, working in dyads or triads from now on?	28	20	9	0	57

Table 3 Comparison between working in dyads and in triads

In comparison with the first questionnaire, the number of the students who had a positive image of dyad interactions increased from 19 to 28 and that of triad interactions increased from 18 to 25. After they had the conversational opportunities in dyads and triads in every lesson, they appear to have become accustomed to the collaborative work and felt more at ease in conversation.

Secondly, when dyad and triad interactions were compared, the numbers of students who had fun working in dyads (26) and triads (25) were almost the same. Five of them stated they enjoyed both (See Table 3). Overall, the students found working in both dyads and triads enjoyable. The reasons why the students chose dyad interactions were mainly concerned with their relationship to their partner. For instance, one stated that as there were only two of them, it forced them to focus on their partner and thus they were able to get to know their partner better. Another stated, "It was easier to know who was the speaker and who was the listener". In contrast, students who had a preference for triad interactions stated that it was mainly to do with the content of their conversations. For instance, some students pointed out that if there were more people, their conversation became lively and the content richer, which in turn made it easier to contribute more.

Next, in response to the question about whether they would prefer to work in dyads or triads in future classes, 28 out of 57 students expressed they would like to work in dyads, whereas 20 expressed they would like to work in triads. (See Table 3). Chi-square goodness-of-fit test with four categories was conducted to test the null hypothesis that the population proportions in each category are equal (i.e., the proportion is 1/4 in each group). The result found a significant difference ($p < .05$). As a post hoc analysis, pairwise comparison was also conducted between dyads and triads to test whether they are significantly different and no significant results were found ($p = .248$). This indicates that there is not a definite difference in preference between dyads and triads. Nine comments on why they now preferred dyad interactions were related to English. For instance, one student stated, "Dyads could improve my English ability and give me confidence". Another commented on the frequency of taking turns, which was not commented on in triad interactions. A unique comment on

working in dyads was that they "felt nervous in a good way", which had a positive impact on their conversation, leading to a sense of responsibility for actively taking part in the interaction. These comments imply that dyads might be the best format for conversational practice. In dyads, they could converse quite easily and at the same time they could contribute to the conversation. On the other hand, 20 students expressed a preference for working in triads in future classes. Eight students stated that communication became easier if there were more people. For instance, one student wrote that "even if one person was not willing to talk, they could keep the conversation going". They also stated it was easier for them to think of more follow up questions and receive more feedback because they could share more information and knowledge. Thus, they felt as if they were engaged in "real conversations". Some students pointed out that if in future lessons they have more opportunities to have group work, these triad interactions may help them feel more confident when they have a collaborative job in their future workplace. In addition, nine students stated that they would like to have both dyad and triad interactions in future. They pointed out that dyad and triad interactions had both good and bad points and that they would like to have dyads first, followed by triads or have them in turns.

To sum up, in relation to the first research question, "Which of the two interactions, a dyad or a triad, do the students prefer?", the numbers of students who preferred dyads and triads were almost the same and no significant difference was found between them. Most of the students enjoyed the conversation in dyads and triads. For future lessons, they expressed a preference for dyad interactions to triad interactions because some felt they could improve their English more in a one-on-one conversation and also there is a greater frequency in taking turns. However, the difference is minimal as they thought that in triads they could communicate with more people as they would in a real situation.

Research Question 2

As mentioned in Literature review, Nagayama (2018) investigated how university students felt toward dyad and triad interactions in everyday face to face communication scenes and categorized the characteristics into groups based on the students' comments respectively. This research applied Nagayama's (2018) categories since he focused on psychological aspects which could play a crucial role in interactions and outcomes. In comparing dyad and triad interactions in an everyday setting as Nagayama did, and an English classroom setting, as is the case with this research, some distinctive characteristics of the English classroom setting might emerge.

Firstly, in Nagayama's study (2018), students' perceptions toward dyad interactions were categorized into 7 groups; 1) concentrated, 2) straight and direct, 3) close and intense, 4) enjoyable, 5) secure and relaxed, 6) tired, 7) open. In an English classroom setting, most of these perceptions were also experienced. Many students mentioned the first three categories. They stated that in dyads they could concentrate on the conversation because it was a one-on-one conversation and they could have good eye contact between them. Limiting it to two people forced them to talk, resulting in taking more turns and close conversations. As the conversations became deeper, they appear to have got to know one another better, which is related to the next category. While Category No 4 is enjoyable in Nagayama, in an English classroom setting, some students stated they made a new friend by talking with their partner. This suggests that dyads interactions are not just "enjoyable" but they go beyond this with students likely to make friends with their partners. This may be partly because they are in the same department and their interests might be similar. Therefore, Category No 4 is referred

to as 'bonded' instead of 'enjoyable'. In Category No 5, secure and relaxed in Nagayama, similar comments are observed in this study, such as "It was easy to talk and ask each other questions", and "I felt at ease with my partner." On the other hand, they felt some pressure to say something to keep the conversation flowing. This could be partly because they felt anxious in speaking English. Interestingly, one student commented that this pressure was not a bad thing as it pushed her out of her comfort zone and she was challenged in a positive way. Therefore, Category No 5 includes mixed feelings such as secure and relaxed vs nervous and pressured. In terms of Category No 6, tired, in this study there were no comments regarding tiredness. Instead, some mentioned time limitations. Because they had limited time to complete the questions, some stated that they felt pressured and did not have enough time to ask follow-up questions. Others stated in comparison with triad interactions, they felt they had sufficient time to talk. Thus, in category No 6, in terms of time, there are opposing responses, some felt rushed and others felt satisfied with the time limit. In Category No 7, open, they also stated they could talk more positively and deeply because of only two members in the group. Other comments stated that there was repetition and their conversations became monotonous. This could be because having just two people, they could not expand their conversation easily. Such comments are not seen in triad interactions. To sum up, in relation to the second research question, "What views do the students have of dyad interactions?", the perceptions towards dyad interactions in an English classroom setting are categorized as follows; 1) concentrated, 2) straight and direct, 3) close and intense, 4) bonded, 5) secure and relaxed vs nervous and pressured, 6) time – rushed vs satisfied, 7) open, 8) repetitive and monotonous.

Secondly, in Nagayama (2018), when the participants had triad interactions, their perceptions were categorized in 9 groups; 1) easy, 2) spread and complicated, 3) unstable and uncomfortable, 4) caring and considerate, 5) adapting to the situation, 6) being public, 7) superficial, 8) objective, 9) unintentionally focused on one member only. Most of these elements were also observed in this research. In Category No1, easy, many students stated that they felt easy because there were three people in a group and they did not need to talk all the time and therefore did not feel anxious. Category No 2, spread and complicated, is characteristic in triad interactions. The students pointed out the difficulty of having a conversation with three people. They commented that topics got mixed up and sometimes went off topic, taking turns was not clear, and it was difficult to find a common interest. Category No 3, unstable and uncomfortable, is also only seen in triad interactions. Some students stated they were confused about when they should start the conversations, also that they did not know who should ask whom and who should answer the questions. This made the conversations difficult to progress and consequently members avoided eye contact. No 2 and No 3 are closely related and overlapped. Moreover, they stated that if one person only gave limited answers such as, "Me, too." or "Me, neither.", the conversation did not flow smoothly. Another student mentioned that if one person did not take the exercise seriously, then it was not easy for the other members to treat the task seriously. These comments as well as the ones related to Category No 2, reveal unstableness in having a group number of 3 which affected both the conversational flow and the relationship amongst members. Category No 4, caring and considerate, No 5, adapting to the situation, and No 6, being public, all reflected their feeling that they wanted to get along well with the other two members for the purpose of social harmony. For example, they commented that it was not easy to ask for help when they did not understand something that the others did. In triads they started to consider their relationship in a group, which made them adjust themselves to the other two members and the situation. In terms of Category No 7, superficial, the students also felt the same way as in an everyday conversational setting. They stated they felt some distance amongst the

group members and conversations became superficial. Category No 8, objective, is related to No 7 (superficial) in that the mental distance among them made them objective, too. Being objective, they tended to think about the power balance in a group of three, which leads to the last Category No 9. In Nagayama, the students paid attention to only one other member, but in this study, they paid attention to the other two members. They stated that when the others knew each other or had a very close conversation, they felt isolated and became passive and they found it difficult to join the conversation. Therefore, in triads, Category No 9 is paying attention to not only one but also two other members. Furthermore, regarding the characteristic "enjoyable", which is seen in dyad interactions in an everyday conversational setting, in this study many students stated it was fun talking in triads. Triads do not mean just the increased number of people, but rather as the saying goes, "Two heads are better than one". They were able to get more information and have more opportunities to learn new things including English language knowledge, which led to enjoyable and satisfying conversations. They may not have had many chances to work in triads before and thus the situation could have presented as quite challenging for them, because they had to consider their relationship to the other two people and the group dynamic. On the other hand, they might have felt free and more at ease because they were relieved of some of the pressure to keep the conversation going. Overall, in relation to the second research question, "What views do the students have of triad interactions?", the perceptions toward triad interactions in an English classroom setting are categorized in 10 aspects. 1) easy, 2) spread and complicated, 3) unstable and uncomfortable, 4) caring and considerate, 5) adapting to the situation, 6) being public, 7) superficial, 8) objective, 9) paying attention to the other members, 10) enjoyable.

Conclusions

In this study, dyad interactions and triad interactions were compared in a classroom setting. The students who were majoring in Engineering had a 10 to 15-minute conversation introducing themselves at the beginning of each lesson. Their interlocutor or group members were randomly selected by computer, which means each time dyad and triad members were different. Overall, they had a very positive attitude toward dyads and triads but they had a slight preference toward dyad interactions. In order to understand the students' perceptions towards dyads and triads, they were categorized into several aspects according to Nagayama's findings (2018). Dyad interactions having only two people, makes the students feel more at ease and they can directly concentrate on their interlocutors, leading to a close relationship. In contrast, triad interactions are more complicated for the students, although more conversation and information can be exchanged. Because triads have more members, one must take care to be inclusive of all participants. This can result in feeling uncomfortable and confused. At the same time this negative aspect gives them an opportunity to learn a sense of being public and develop social skills. One student mentioned triad interactions could provide practical preparation for their future career. Therefore, adopting triad interactions in English lessons may provide a double advantage to students: learning English, and learning communication skills and social skills. This could have some implication when teachers use pair work and group work in English lessons

In closing, this study has several limitations. Firstly, how to make dyads and triads. In this study, a computer generated the pairings and groupings, so the students' intention or preference is not reflected. If they were permitted to freely choose their interlocutors and group members, they might have different perceptions toward dyad and triad interactions. Another option can be having the same interlocutors or group members all the time. Secondly,

since this study was implemented as part of a lesson, the number of the participants was small. A greater number of participants should be included to collect more qualitative data. Thirdly, with regard to the categorization of the students' perceptions, this was decided by one researcher only. In order to improve the reliability, more researchers' judgments should be included. Furthermore, this study shows only qualitative and subjective aspects of the students' perceptions but quantitative data should be also included. Finally, self-introduction was used in this study, but some other classroom tasks can cause different reactions from the students.

To sum up, dyad and triad interactions can be an effective tool to help those students in particular whose major is not English, as most of the students enjoyed dyads and triads and were able to improve their English learning, communication skills and social skills by conversing with their classmates. Hiromori (2018) said that motivation can be greatly affected by others both in a good way and a bad way and that when groups have a good relationship, motivation can be transmitted to others in a positive way. In order for students to get involved in English lessons actively, teachers should keep the students' psychological factors in mind and use dyad and triad interactions more.

Note: An earlier version was presented at the English and American Literature and Linguistics Society on December 1 in 2019, and was subsequently revised and edited.

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Stress, Procrastination and Proactive Coping of Selected Foreign Psychology Students

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The IAFOR International Conference on Education in Hawaii 2022
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Abstract
Students encountered challenges amidst this Covid-19 pandemic. These students managed to have a face-to-face class, but due to pandemic, they were migrated to a digital classroom. This research study emphasized on stress, procrastination, and proactive coping of selected foreign Psychology students (N=399). enrolled in one of the universities in South Metro Manila. Researchers employed the descriptive- comparative and correlational design in this study. This study predicted that there are no significant differences in the respondents' stress, procrastination, and proactive coping in terms of gender and socioeconomic status. Similarly, it was hypothesized that stress is not significantly related and predictor of procrastination and proactive coping, and procrastination is not significantly associated and predictor of proactive coping of the selected international students. The results manifested male and female respondents did not significantly vary in their stress (t=.057, p>.05), procrastination (t= 1.713, p>.06), and proactive coping (t= -1.322, p>.05). In terms of socioeconomic status of below 5000 Rps, 6000-10000 Rps, 11000 - 15000 Rps, 16000 - 25000 Rps , and 26000 - 29000 Rps, it was found out that there are no significant differences in the stress (F= 1.288, p>.05, procrastination (F=.288, p>.05), and proactive coping (F=.141, p>.05) of the respondents. Nonetheless, stress of the respondents is found positively and significantly associated to their procrastination (r=151, p<.05); procrastination is negatively and significantly correlated to their proactive coping (r=-.512, p<.05); the stress of the respondents is not connected to their proactive coping (r=.087, p>.05). Using regression analysis, stress is significantly a predictor of procrastination but not of proactive coping, and procrastination predicted proactive coping of the respondents.

Keywords: Stress, Procrastination, Proactive Coping

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Introduction

This research on "Stress, Procrastination and Proactive Coping of Foreign Psychology Students" was conceptualized to determine if the psychological constructs are significantly related to each other. The authors had an impression that there is a dearth of local literature or empirical studies that focused on foreign students' experiences during these challenging times. Foreign students encountered challenges amidst this Covid-19 pandemic. They were migrated to digital classroom so not to hamper their learnings. These foreign students may experience stress, and procrastination is inevitable.

A study conducted by Wu (2018) on the relationship between procrastination styles, coping styles, perceived stress, personality traits, and academic outcomes in a sample of undergraduate students. The result of his study showed that active procrastination was associated with active coping and less perceived stress; passive procrastination was related to greater perceived stress and positively related to neuroticism while and active procrastination is positively associated with extroversion and conscientiousness. Procrastination styles are not associated with academic outcome.

Moreover, this research was guided by the following theories: 1. Lazarus' Transactional Model of Stress and Coping (Lazarus and Folkman, 1984); 2. Temporal Motivation Theory of Piers Steel and Cornelius J. König (Siaputra, 2010). 3. Proactive Coping Theory of Schwarzer and Taubert (2002).

The Transactional Model of Stress and Coping, proposed by Lazarus and Folkman (1984), contended that a person's capacity to cope and adjust to challenges and problems is a consequence of transactions or interactions that occur between a person and their environment. Temporal Motivation Theory (TMT) is an integrative motivational theory developed by Piers Steel and Cornelius J. König (Siaputra, 2010). The theory emphasizes time as a critical and motivational factor. Temporal motivation theory emphasizes the impact of time and deadlines on the motivation to complete tasks. TMT argues that as a deadline for completing an activity nears, the perceived usefulness or benefit of that activity increases exponentially. TMT is particularly useful for understanding human behaviors like procrastination and goal setting.

Proactive Coping Theory of Schwarzer and Taubert (2002) provides functional strategies that use goal-oriented and long-term behaviors that allow people to anticipate and handle perceptions of stressors positively before the stressors are even faced. A key to functional coping strategy is to shift focus from mere responses to negative events toward a broader range of risk and goal management that includes the active creation of opportunities and the positive experience of stress. The theorists emphasized that stressors do not necessarily exist except through the interpretation of the individual. Goals and expectations may create opportunities and risks. Striving for rewards, goals, and benefits can generate unanticipated stress.

Statement of the Problem

This study aimed to determine the interrelations of the constructs and specifically, the following research queries were answered:

1. Are there significant differences in stress, procrastination, and proactive coping of the respondents in terms of gender and socio-economic status?

2. Are there significant relationships between the stress, procrastination, and proactive coping of the respondents?

3. Is stress a significant predictor of procrastination and proactive coping?

4. Is procrastination a significant predictor of proactive coping?

Hypotheses

Based from the problems of the study, the null hypotheses were formulated and were tested at 0.05 level of significance

H01: There are no significant differences in stress, procrastination, and proactive coping of the respondents in terms of gender and socio-economic status

H02: There are no significant relationships between the stress, procrastination, and proactive coping of the respondents

H03: Stress is not a predictor of procrastination and proactive coping. Procrastination does not predict proactive coping

Methods

The researchers utilized a descriptive-correlational and comparative design. Descriptive correlational was employed to determine the correlations of stress, procrastination and active coping of the respondents. Likewise, comparative design was used to establish if significant differences exist in stress, procrastination and proactive coping of the respondents when grouped according to profile variables.

A sample of 399 purposively selected College of Arts and Sciences Foreign Psychology students from one of the universities in South Metro Manila participated in this study.

To measure the stress, the researchers utilized the Perceived Stress Scale by Sheldon Cohen (1983), General Procrastination Scale by C. Lay (1986) for procrastination, and Proactive Coping Inventory by Esther Greenglass, Ralf Schwarzer, Dagmara Jakubiec Lisa Fiksenbaum & Steffen Taubert (1997) for proactive coping of the respondents. Perceived Stress Scale by Sheldon Cohen (1983).

Statistical Analysis

Mean and standard deviation were used to determine the average scores of the respondents' stress, procrastination and proactive coping. T-test for independent samples was used to determine the significant differences on respondents' stress, procrastination, and proactive coping terms of gender. One-way Analysis of Variance was also utilized to measure the significant differences on respondents' stress, procrastination, and proactive coping terms of socioeconomic status. Pearson r was used to determine the relationship of the constructs: stress, procrastination, and proactive coping of the respondents. Regression Analysis was also utilized to determine if stress is the predictor of procrastination and proactive coping.

Results and Discussion

Table 1
Significant differences in the stress, procrastination, and proactive coping of the respondents in terms of gender.

	Male	Female		
Variable	M (SD)	M (SD)	t (397)	p
Stress	32.38 (4.97)	32.35 (4.16)	.057	.954
Procrastination	54.61 (8.76	53.10 (8.81)	1.713	.087
Proactive coping	43.51 (5.82)	44.28 (5.74)	-1.32	.187

Male and female Foreign psychology respondents did not significantly vary in their stress (t=.057, p>.05), Procrastination (t= 1.713, p>.06), and proactive coping (t= -1.322, p>.05).

The results contradict with the results of the study conducted by Arslan K., Zhang, Q. Wei Wang, Ghaffari, A. S. & Pan, F. (2019) among Chinese MBBS students that male students reported higher levels of procrastination and perceived stress reactions than their female counterparts.

Table 2
Significant differences in stress, procrastination, and proactive coping of the respondents in terms of socio-economic status.

	Below 5k INR	6-10k INR	11 - 15k INR	16 - 25k INR	26 - 29k INR		
Variable	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	F(4,394)	p
Stress	32.22 (4.71)	32.28 (3.95)	33.14 (4.11)	32.85 (4.37)	31.68 (5.92)	1.288	.274
Procrastination	53.28 (8.98)	53.63 (7.56)	54.61 (8.00)	54.37 (8.92)	53.68 (9.95)	2.88	.885
Proactive coping	43.83 (5.40)	43.64 (5.47)	44.02 (5.56)	43.66 (4.85)	44.16 (7.02)	.141	.967

In terms of socioeconomic status (Kuppuswamy Standard) below 5000 Rps, 6000-10000 Rps, 11000 - 15000 Rps, 16000 - 25000 Rps , and 26000 - 29000 Rps, it was found out that there are no significant differences in the stress (F= 1.288, p>.05, procrastination (F=.288, p>.05), and proactive coping (F= .141, p>.05) of the respondents.

Table 3
Significant relationship between the stress, procrastination, and proactive coping of the respondents

Variable		r	p
Stress			
	Procrastination	.151	.002
	Proactive Coping	-.087	.081
Procrastination			
	Proactive Coping	-.512	.000

Stress of the respondents is found positively and significantly associated to their procrastination (r=.151, p<.05). This result supported the findings of the study of Beleauad Cocoradă (2015) that the participants who tend to procrastinate frequently are more likely to feel higher levels of stress but are less prone to use proactive coping and engage more frequently in avoidance coping. Furthermore, the stress of the respondents is not connected to their proactive coping (r=-.087, p>.05) while their procrastination is negatively and significantly correlated to their proactive coping (r=-.512, p<.05).

Table 4
Predictors of Procrastination and Proactive Coping

Variable	R^2	F	B	p
Stress				
Procrastination	.023	9.26	.151	.002
Proactive Coping	.008	3.05	-.087	.081
Procrastination				
Proactive Coping	.262	140.96	-.512	.000

Using regression analysis, stress is significantly a predictor of procrastination but not of proactive coping, and procrastination predicted proactive coping of the respondents.

Conclusions

Male and female Foreign Psychology students coming from different socioeconomic status are having the same level of stress, procrastination, and proactive coping. Respondents' stress is positively and significantly associated to their procrastination; procrastination is negatively and significantly correlated to their proactive coping. Likewise, the stress of the respondents is not connected to their proactive coping. Stress is a significant predictor of students' procrastination but not of proactive coping. Procrastination predicted proactive coping of the respondents.

Acknowledgement

We would like to thank our families for their undying support. The participants and colleagues who made this research possible. Last but not the least the support of Dr. Belinda Conde, our Research Director for the continued support and encouragement. Thank you so much is the simplest way I can express my utmost gratitude.

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Why Teacher Led Instruction Really Works

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IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Since the 1980s the notion of teacher led instruction (Direct Instruction) has been largely dismissed in favour of a more student-centered (Indirect Instruction), collaborative, problem solving type pedagogy. Certainly, the student-centered approach, characterized by inquiry, problems solving and active learning, is an effective practice which is supported by empirical evidence (Yuen & Hau, 2006). However, this pedagogical division between the 'sage on the stage and the guide on the side' (King, 1993) type approach to teaching has led those in education to believe that Direct Instruction is the lesser cousin to Indirect Instruction and therefore should be minimized. This paper questions this common narrative, and drawing on research and current literature argues that there is a significant place in education, for the 'sage on the stage'. The author suggests that teachers should consider adding another tool to their teaching repertoire and revisit this approach, at times, when needed, in order to maximize student learning. To support the literature, this paper presents findings collected from student and faculty perceptions on teaching pedagogy, which provide evidence to suggest the effectiveness of Direct Instruction alongside Indirect Instruction as a classroom instructional practice. This study takes place in a tertiary institution in the United Arab Emirates referred to in this paper as Dubai University. This research contributes to knowledge by filling a gap in the field on the perspectives of learners and teachers on Direct Instruction and by raising awareness around the role of Direct Instruction within education.

Keywords: Direct Instruction, Indirect Instruction, Teacher Centered, Student Centered, United Arab Emirates, Teaching Pedagogy

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Introduction

Background

Within teaching pedagogy there is a wide spectrum from more traditional teaching-centered, rooted in behaviorism, to more student-centered viewed as current and leaning on social constructivism (Pegalajar, 2015, Serin, 2018). In fact, teacher led/Direct Instruction has become almost demonized within education in favour of discovery learning, group work, collaborative, student centered tasks (Morrison, 2014). This student-centered approach is generally seen as the gold standard benchmark from which current practice is based (Saunders & Goldenberg, 1996). However, this is an overgeneralization that does not serve any of the stakeholders from learners, to faculty to management as it limits classroom practice and is based on a 'one size fits all' set of assumptions (Schuh, 2004). As a result of this lean toward student-centered classroom, teachers have been busy devising ways for students to collaborate and reduce our teacher input, evidenced by the plethora of research to support the use of student-centered learning (Borda et al., 2020). Meanwhile, a quiet revolution has been taking place as research suggests that there is explicit value in teacher led instruction (Jennings, 2012). This paper seeks to uncover the evidence and beliefs around Direct Instruction and presents both an examination of the literature and findings collected from student and faculty perceptions on this approach. It asks the question that is key to all teaching, what are the foundations of our pedagogical stance? Is teacher centered actually the less sound approach that we perceive it to be?

It is important to note that this research is not dismissing discovery/ collaborative learning, the author is indeed an advocate of this approach. This research is an exploration, triggered by reading around the impact, and renaissance of Direct Instruction and a curiosity about its place and effectiveness in the author's context. The authors' interest was piqued from this reading and as she experimented with a more direct approach at times she found informal student feedback to be positive, thus initiating the need for a more formal study.

Indirect Instruction: Definitions and Literature

To begin, it is important to establish common definitions of both Direct and Indirect Instruction.

Indirect Instruction is what is more commonly referred to as student centered teaching, born out of the pedagogical foundations of constructivism, standing on the shoulders of the 'giants' in the educational world of Piaget and Vygotsky (Al-Humaidi, 2014). Key here is that students 'construct' meaning, 'create an understanding' of their world, and they are active learners engaged in social exchange (Massouleh & Jooneghani 2012).

A table by Khusnik (2021, pp 9-10), categorizes Direct and Indirect Instruction with key features of Indirect Instruction identified as:

- Determined by learners
- Students are active
- Learner interaction
- Concepts checked
- Student centered e.g student decide on learning activities
- Flexible seating
- Inquiry based

- Discovery driven
- Problem solving

Literature concurs with this definition and we can see a picture of Indirect Instruction emerging as one being pedagogically effective, engaging for the students and inquiry driven (Geisli, 2009; Alrabai, 2016). Indeed, there are literally hundreds of thousands of research articles in support of an indirect student centered approach based on the same principles. A rudimentary search on google scholar cites 357,000 articles on the benefits of Indirect Instruction.

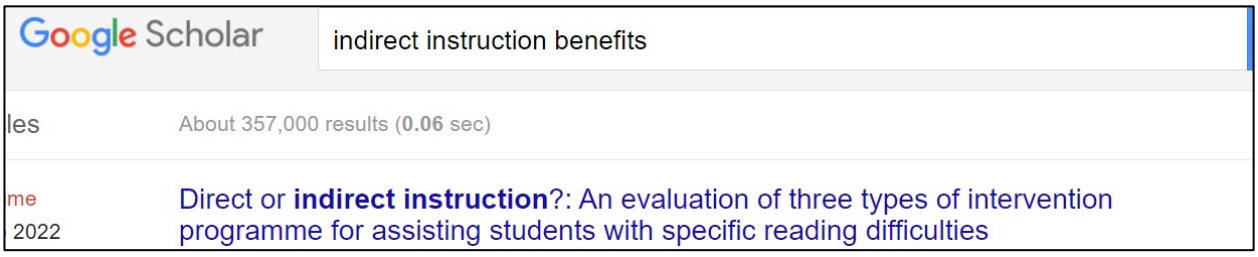

Figure 1: Google scholar search Indirect Instruction Personal Experience

Alongside the literature, for many of us in education, our first taste of Direct and Indirect Instruction was experienced as teacher trainees. The author had her first understanding of Indirect Instruction in the 1980s when doing a CELTA (Certificate in Teaching English to Speakers of Other Languages). It was in this context where the idea of teacher talk was introduced with great zeal and it was deeply instilled in candidates that the aim of the teacher was to talk as little as possible and 'elicit, elicit, elicit'. The notion behind this is that in communicative language teaching it is the students' job to talk and the teachers to facilitate that that communication (Mackenzie, 2018).

Interestingly, an article by Hitotuzi (2005) questions this approach. In an experiment that carefully tracks her teacher talk time, (which she acknowledges as higher than recommended at 40-60%), the author is able to provide evidence for a student centered approach, despite the perceived excessive time spent talking.

As educators we would be hard pressed to find an argument *against* incorporating some type of Indirect Instruction into our practice. This is based not only on the literature but on experiences gleaned from anecdotal evidence from the countless conversations the author has had in staffrooms and various corridors of learning.

Direct Instruction: Definitions and Literature

In contrast, there are numerous arguments that are less supportive of Direct Instruction, and one of the conundrums in this pedagogical discussion is that Direct Instruction is often misunderstood and misconceived.

Rüütmann and Kipper (2011) describe Direct Instruction as the "rapid attainment of facts, rules and action sequences. Content is divided into small, easily learned steps through the presentation, involving brief explanations, examples, practice and feedback" (p. 112).

In an article published by the University of San Diego, Joseph Lathan, professor of teaching and learning presents an article detailing teaching types and describes Direct Instruction as a

way for teachers to transfer knowledge without allowing for practice. He says: "teachers convey knowledge to their students primarily through lectures and scripted lesson plans, without factoring in student preferences or opportunities for hands-on or other types of learning" (Lathan, 2022, para 12).

Kassem (2018) argues against teacher centered learning claiming it is said to "prevent students; educational growth because in teacher-centered classrooms teachers do most of the work and the learners are always passive recipients of knowledge" (p. 134).

The imagery here is almost one of a 19th century educator blindly lecturing, drilling in facts, with little regard for their students.

The visual illustration below, from popular teaching and learning platform study.com captures the public perceptions of Direct Instruction. Here the teacher is seen as the authority figure lecturing to students who appear nonplussed. While lacking kudos in the elite academic community, as an institution boasting over 30 million students per month, study.com is not a platform without influence (Take online courses, 2022).

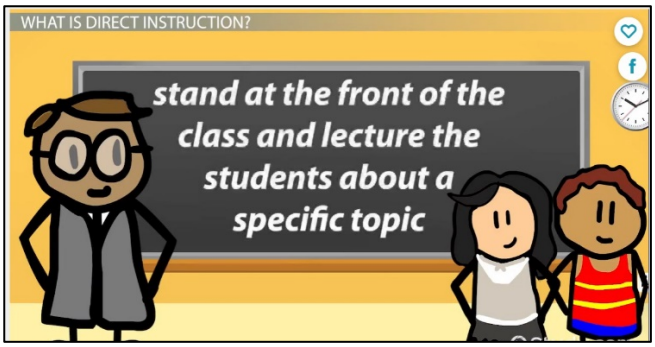

Figure 2: Study.com image of Direct Instruction
(Direct Instruction vs. Indirect Instruction, 2022)

In Defense of Direct Instruction

What this image fails to represent is that lecture style may comprise a much more active and engaging learning experience, as Maynes (2012) succinctly puts it "Teacher input sessions, often referred to as modeling, include a much more *dynamic interaction and exchange of ideas* than is implied by the description lecture-style presentations" (p.41).

The author is reminded here of the parable of the emperors new clothes where a common belief is accepted perhaps with little to support it. However, the objective of Direct Instruction is rooted in practices we still value today.

Historically, the term Direct Instruction was aimed to capture a more intentional instruction and was developed by Engelmann and his colleagues (Engelemann 1992) with two main assumptions: 1) Children learn when they are explicitly taught, and 2) Teachers can 'teach' effectively when equipped with the correct instructional techniques. These 'techniques' involve a careful scaffolding of material, scripted lessons to ensure instructions are clear and comprehensive, continuous assessment and incorporate a number of activities for students to practice their skills (Engelmann, 1998). Apart from the use of scripts, these principles still hold strong today and the foundations that Direct Instruction are based on are sound.

The notion of teacher centered Direct Instruction has been revisited by Barak Rosenshine whose seminal chapter "The Emipirical Support for Direction Instruction" (Rosenshine, 2009) argues that guided practice is integral to Direct Instruction followed by a strategic transfer of responsibility to the learners. This approach is often referred to as the *gradual release of responsibility* model (Fisher, 2008), and describes the shift from teacher reliant to co-creators with teacher, to independent application and practice. Direct Instruction does not necessarily equate to 'talking at' students, rather it is purposeful, often interesting and engaging, well planned guided practice (Rosenshine, 2009).

Direct Instruction has been prone to misinterpretation and a certain bias amongst the academic community, perpetuated by a 'myth' of the stand alone, fairly dry, 'teacher knows best approach'. Where is the evidence for this?

What does the literature say?

An examination of 328 studies on Direct Instruction from 1966- 2016 (Stockard et al., 2018) points to the overall effectiveness of this approach in the classroom across a broad range of subjects. A study by Pascarella & Blaich (2013) exploring factors which foster successful liberal arts learning cites the role of the teacher as critical in classroom instruction. Findings suggest the need for teachers to present material effectively and 'teach', arguing that developing teachers' instructional skills should be high on any institute's agenda. In an examination of discovery learning, Alfieri, et al., (2011) conducted 2 meta analyses of 164 studies, their findings reveal that explicit instruction was a consistently more effective pedagogy than unassisted discovery. An aptly titled article by McMullen and Madelaine (2014): *Why is there so much resistance to Direct Instruction?* acknowledges that while there is empirical evidence to support the implementation of Direct Instruction it is often widely criticized. The article goes on to outline the virtues of Direct Instruction, emphasizing the careful sequencing of skills focusing on student success and mastery, high engagement, inclusivity, immediate correction and mastery checks to ensure students develop competency. As evidence, the researchers refer to a 1967 study in the USA: Project Follow Through, that investigated various instructional classroom methodologies across 70,000 students in which Direct Instruction "consistently delivered the highest results across a number of categories" (Kim & Axelrod, 2005, p. 112 as cited in McMullen & Madelaine, 2014).

The literature provides evidence to argue the merit in both a teacher centered *and* student-centered approach, with generally more attention and gravitas given to the student-centered approach. However, teachers tend to shun Direct Instruction, possibly influenced by the 'sage on the stage versus the guide on the side' (King 1993) theory. King's theory suggests that the improvement to education has arisen because teachers have taken a more guide on the side approach to teaching, involving more active engaged learners who take responsibility for their learners and the teacher's role is to guide rather than deliver knowledge (Rachelle, 2011). Curious to dig deeper, and explore both student and teacher perceptions of Direct Instruction the author conducted a study, the results of which are outlined below.

Conclusions

Methodology

This is a mixed methods study using both qualitative and quantitative data, in order to get a fuller picture of the phenomena being researched. The researcher's own students were asked

to volunteer to participate in this study, after class time. Students were assured that all responses were confidential and not related to the course of study or had any grade bearing. Student perceptions were collected through surveys with a mix of both quantitative and qualitative questions. Descriptive statistics was used to describe the features of the quantitative data considering mean with graphs to illustrate. Teachers were invited from the authors department to participate in interviews. This qualitative data was coded looking for patterns and frequency to find significance and meaning from the data. Teachers were assured confidentiality and ethics approval for this research study was received from Dubai University.

Survey: Student Perceptions of Direct Instruction

A total of 14 questions comprising eight agreement questions and four open ended opinion questions are utilized in this student survey. Questions are adapted from the work of Murphy et al., *Teacher-Centered versus Student-Centered Teaching* (2021) as this is freely available, validated and informed by theory. Twenty four students responded out of a class of forty.

Quantitative Questions

Question Two asks students to rank: *I learn best when the teacher explains things to me*

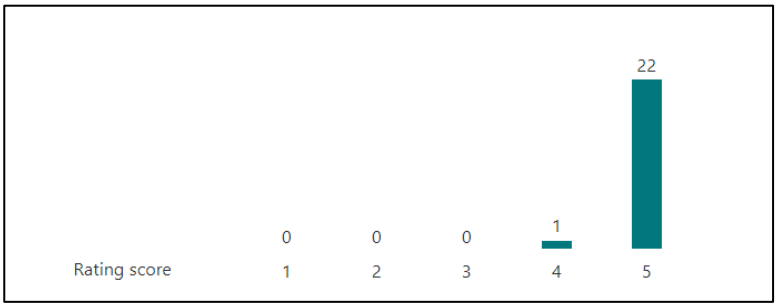

Figure 3: Students' rating of effectiveness of teacher explanations for learning

Ninety nine percent of students ranked 5 for this question showing a very high agreement and indicating that, according to these learners, they learn best with teacher explanations.

To contrast and verify the findings from question #2. Question Three asks students to rank: *I learn best when I understand things on my own*

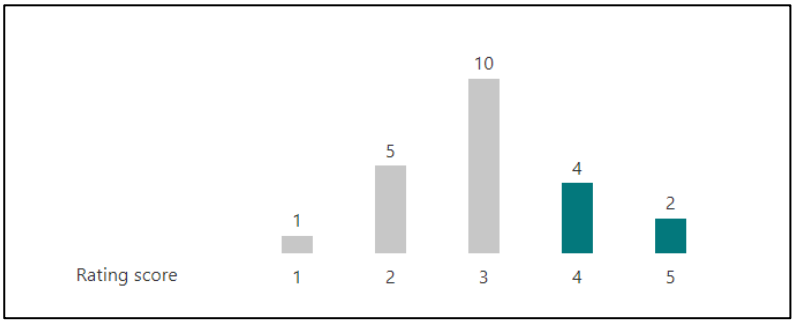

Figure 4: Students' rating of effectiveness of independent learning

Only twenty seven percent of students ranked 4-5 for this question, with the majority ranking at a 3, showing moderate agreement. This confirms the results from question two that these

students learn best from teacher explanation, especially when compared to discovery type learning where students learn on their own (Ozdem-Yilmaz, & Bilican, 2020).

To further validate this key question, Question Six, asks students to rank: *the teacher explaining the lesson,* as a teaching method they prefer, alongside other methods.

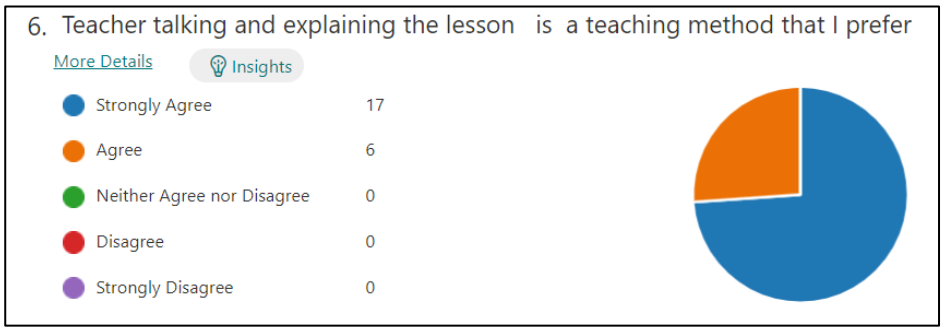

Figure 5: Students' rating of effectiveness of teacher explanations when compared to other methods

Findings show that 74% of the participants strongly agree, and 26% agree that their preference in lesson delivery is for the teacher talking and explaining the lesson. This corroborates the findings in questions two and three, and provides robust evidence to indicate that these students prefer teacher explanations to inquiry based/independent type work.

To illustrate the strength of responses in question six it's important to view it in comparison to the alternative questions. Questions five to nine ask students to state their preference to different teaching and learning approaches and activities, including:

- Group work
- Flipped and independent work on Blackboard Learn
- Working with a partner
- Working on a task in class such as reading or writing
- Watching a video lesson
- Question six teacher talking and explaining the lesson.

Note, each task is ranked individually and participants are **not** asked to compare. Comparison is done by the researcher.

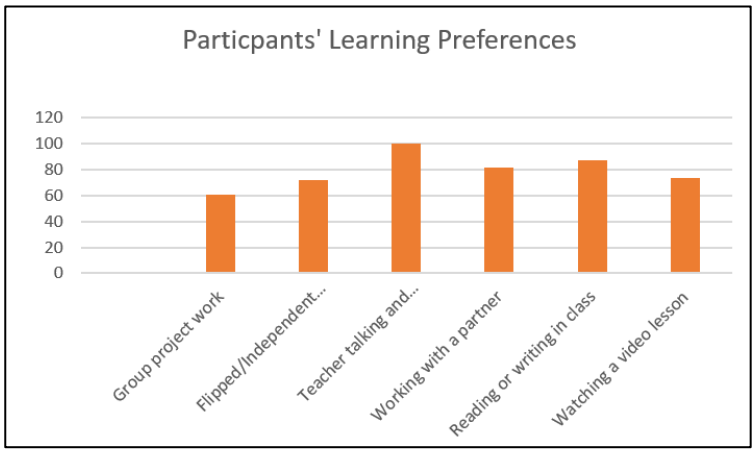

Figure 6: A comparison of learning preferences

It's interesting to note here that while 100% of the participants ranked teacher taking and explaining the lesson as a preferred way to learn, second to this is reading or writing in class, with 87% of the participants in agreement. Group project work scores the lowest here at 61% of participants in agreement.

The pattern that is emerging here is that students indicate a preference for more passive teacher led classroom activities, compared to, for example, the flipped work which is completely independent, scores at 72% agreement.

In hindsight there are some limitations to this survey and this could be improved on for further study. The researcher purposefully avoided the words teacher centered/Direct Instruction and student centered/Indirect Instruction as they are unfamiliar to these participants. Instead the researcher aimed to categorize activities into either direct or indirect learning which on reflection is problematic. Teacher talking and explaining the lessons obviously transfers to 'teacher led'. While literature categorizes reading or writing in class as again teacher led and fairly passive, this is ostensibly context and personality dependent, and many teachers would argue, rightly so, that their reading and writing lessons are dynamic active student-centered learning tasks. Herein lies the problem, it is difficult to know which end of the spectrum these participant's reading and writing lessons fall in, although a guess would suggest they lean toward the former, teacher led, as these students' lessons are often prescriptive and exam based. On the other hand, group work and flipped work, which obviously sit at the student-centered end of the learning spectrum are clearly indicated as the least preferred, providing more evidence that these learners prefer a teacher led classroom experience.

The findings to the group work question is further corroborated in the opinion question #13: *Does working together in your group help you learn? Why or why not?* Of the 23 responses, nine indicate that no, or only sometimes group work helps them learn. This indicates these findings are sound.

Qualitative Questions

Four questions sought to elicit students' opinions on their preferred learning styles – be it direct or indirect teaching.

Question 10 corroborates the findings from questions 2, 3 and six above in asking students: *Does the teacher explaining the lesson to you help you learn? Why or why not?*

All 23 responses, i.e. a 100% of participants responded yes to this answer with the largest reason cited as: it helps me understand, responses also indicate that this is preferred to independent learning with responses such as:

better than depending on myself"
difficult learning by my own"
the teacher knows best"

This confirms that these participants prefer direct teacher led instruction.

Questions 11 digs deeper into this by asking the participants exactly *what* it is that teachers do in the classroom that helps or hinders their understanding. Explanations and repetition and

review were the highest frequency answers given as the activities teachers do that most help with their learning. No feedback was given as to what hinders learning.

> They explain slowly and repeat in a gentle voice.
> they explain using example and story and talk nice interesting way
> They listen me and they explain in a simple way in simple words and make review the next class

This aligns with the literature where repetition and clear teacher instruction are viewed as pedagogically effective classroom practices (Andergassen et al., 2014; Scrivener, 2005). Indeed the basis of the spiral curriculum stems from repetition and with it a deepening learning from each cycle of repetition (Shang, 2009). Again, this confirms that these learners prefer explanation and 'being told' to discovery type learning.

Question 12 asks about project work as this directly aligns to indirect or student-centered learning. Out of 21 responses, five participants indicated they did not like project work, only two gave reasons as it being 'extra work' or 'not useful'. This equates to around 76% of participants liking project work as an effective means of learning, reasons given being that

> it helps us research and learn more
> by doing the thing by my self it will stuck in my head
> because i can summarize all what i took in the course

This suggests that despite showing some preference for teacher led instruction, project work is seen as effective by the majority of the students. This may indicate that while teacher led instruction is seen as valuable in introducing the learning point, project work may be an effective practice activity.

Question 13 asks about group work and seeks to confirm the quantitative question above about group/project work which scored 60% agreed: *Does working together in your group help you learn? Why or why not?*

Fourteen of the twenty three responses, or 61% indicated, yes, they liked group work, this correlates with the quantitative answers above. Reasons given were that they can help each other. Five students said they did not like group work as students did not do their share of the work and four students were 'on the fence' stating sometimes they like group work. This illustrates that there is a slight lean towards group/project work, however it is not significant.

Summary Survey responses

The survey responses display a significant preference for learners towards direct teacher led instruction and show reliability in the triangulation of answers. This may be due to the educational background of these learners often being from government schools where rote learning and teacher are the norm (Bristol-Rhys, 2010). It is worth noting though that teacher led does not correspond to passive in this instance, as an experienced educator in the region, the researcher has moderated many a lively discussion, and managed hundreds if not thousands of classroom tasks involving active participation which these learners have partaken in enthusiastically. What the findings in this survey simply tell us is that these students learn best, particularly in the introduction of new material, through being told, through stories, through lectures. That learning can then be cemented through practice

activities, but given a choice between independent discovery learning and simple, interesting explanation that's repeated, that is their preference. Rosenshine (1995) argues this initial guided practice is key to learning and that new material needs to be *presented* in small easy to assimilate steps. It's our job as educators to honour that.

Interviews: Teacher Perceptions of Direct Instruction

Q. 1What is your understanding of Direct and Indirect Instruction also known as teacher and student centered?	teacher is actively, teaching and explaining teacher centered -negative connotation students are passive. teachers, doing work, rely on one person teacher is directing the group of students. students centered would put more of the responsibility on the student they need to generate knowledge and use the knowledge bounce ideas off each other, learn skills of communication and collaboration, that's what the real world is all about. they're speaking to each other, they're collaborating, they're engaging.
Q.2 What is your teaching style one or the other or both?	my approach was a lot more teacher centered, because of the type of students that they are, that I would adjust it. I do both. I'm somewhere in, in, in the middle I'd prefer to get beyond reductions and binaries Prior to COVID a lot more student centered, a lot more letting them do a lot more talking. My preferred style would definitely be student centered During the COVID time, because of the limited access I've changed my approach, make sure that the students get enough content, so a little bit more teacher led it depends on the group of students I have to be adaptable - it's not as much teacher led
Q3: How did you develop your teaching approach?	I put myself in the shoes of the students and, understand how they would feel and what hey would need. I don't think my philosophy is fully conscious, and there are personal, , variables in it. the learner centeredness fits in with my wanting to listen happy to listen to that., it's hard for me to kind of separate, who I am and the methodology, When I was at school, it was all student led. It was all, collaborative activities. From very early age, I've been in that kind of mode

	own experiences from the teacher training it's my work ethic the last 18 months has made it's different had to look at what works best for different groups and you have to adapt
Q4: Response to research in support of Direct Instruction?	we have pendulum swings and, you know, what's popular and what's not. I understand if we went too far with student centered, you now, and we realize we also need teacher link it with human learning.- negative connotation to lecture, if a lecture is standing and talking - misrepresentation of what it can be.a good story could change somebody's life. you do need to lecture every now and then, there is a place for lecturing hundred percent agree that it's teacher-based It has to work in tandem. I think. They need that teacher led like a leader, but they need, like you would in a project to be able to work towards showing that you can achieve

The purpose of the interviews was to glean teacher perceptions of Direct Instruction and to identify how their pedagogical stance transferred to classroom practice. Four teachers volunteered to be interviewed. McMullen and Madelaine (2014, p. 143) ask the all-important question around teacher perceptions of Direct Instruction: "*So, with all of this evidence to support DI, why do teachers reject or avoid it*?" They argue that research suggests the educational profession prioritizes inquiry led over Direct Instruction and that this philosophical stance is then adopted by educators. With this in mind, the researcher aimed to capture teacher perceptions to see if they concur with those of McMullen and Madelaine.

Teachers interviewed were current colleagues at Dubai University, a female only tertiary institute in the United Arab Emirates. All teachers were western educated and teaching in the humanities, across subjects as varied as sustainability, research methods and future foresight.

Questions were structured for consistency.

The table below summarizes the answers to the key questions around Direct Instruction. While more discussion ensued, for purposes of brevity this has not been included.

Table 1: Summary Interview Questions and Answers

Key (names changed for confidentiality)

Alice
Robert
Ben
Lucy

Question One seeks to establish a common understanding of the terms Direct and Indirect Instruction. Participants were more familiar with the terms Teacher and Student centered and definitions aligned with established theory with key terms such as 'responsibility, 'collaboration' and 'explanation' used.

Question Two asks participants about their own teaching approach – Direct or Indirect instruction or both. The answers were interesting in their *lack* of uniformity, showing a diversity in teaching approaches both amongst and within themselves. All four teachers spoke

of times where they used one or the other approach. This illustrates that these teachers are not tethered to a particular pedagogy, that they are able to cherry pick when and what approach to use, and they come from an ethics of care (Noddings, 2002) showing concern for the needs of the students.

Question Three asks about the background of these teacher's philosophies, and casts more light on the other questions.

Question Four seeks to establish participants perceptions of Direct Instruction. Contrary to the literature, there appear no negative perceptions of Direct Instruction. What is significant here, and what corroborates the answer to question two above, is that teachers see Direct and Indirect Instruction as working together in a partnership, albeit, with a slight bias towards students centered. An interesting analogy used by one of the teachers is that it's almost a business model, students need a leader (a teacher) but they also need to show they can achieve through student centered activities.

To summarize, teacher perceptions of best practice lean slightly towards a more student-centered approach, this is unsurprising as many of these faculty were trained in this method and two have an English language teaching background. There is consensus in an openness toward Direct Instruction when needed, depending on context such as ability of students. These findings, disagree with previous research, however, and show a more positive outlook towards Direct Instruction with one teacher openly using it, as most fitting to the context of their students, and one being 'in the middle'. Perhaps it is the wisdom of experience that brings this openness, with these teachers having an average 20 years' experience, literature concurs that experienced teachers often carry with them more flexibility than novice teachers (Berliner, 2001). Views are varied as to how their teaching philosophies were formed, citing educational experiences, personality, and empathy for the students as driving their approach. Overall the teacher interviews portray teachers who are mindful of their context, reflective, motivated by care for their students, and overwhelmingly flexible and adaptable. At this stage it's hard to pinpoint whether this adaptability is in their inherent teaching nature or a necessary response to COVID, or perhaps a combination of both. Flexibility is a significant attribute these teachers bring to their teaching careers, as not only does it allow them to remain open to different teaching modalities, it prepares them for the realities of teaching during the pandemic. As Rüütmann and Kipper (2011) claim: " Knowledge of a variety of instructional strategies and flexibility to change them within and among lessons are two of the greatest assets a teacher can have" (p. 60).

Final

This paper has shown that there is a predisposition within education towards a student-centered indirect approach within education, and that this approach while empirically sound, should not be perceived as 'better than' Direct Instruction. There is a plethora of research to suggest that Direct Instruction is based on pedagogically solid footing, and has significant classroom success. The findings from the study in this paper indicate that these participants prefer Direct Instruction as their teaching modality as an introduction to the learning material, although student centered project work is seen as effective practice. Teacher interviews suggest that teachers use a combination of both Direct and Indirect Instruction effectively depending on the context and that teachers have mastered the art of adaptability as a core tenet.

The author would like to suggest that Direct Instruction can effortlessly cement meaning through a powerful lecture, an engaging story, or a teacher's curiosity transferring through to the learners in an insightful explanation. Yes, the teacher is the center here, but does learning happen? Quite possibly yes, and is learning memorable? Quite possibly yes. Importantly, lesson planning is complex and it is not a matter of choosing one approach over the other, Direct and Indirect Instructional approaches work together (Maynes et al., 2010) and this is where their strength lies. This research provides evidence to suggest teachers should consider adding another tool to their teaching repertoire: that of Direct Instruction. The notions of sage on the stage versus guide on the side are based on an outdated false dichotomy that does not serve educational practice; both provide comprehensive models that teachers can, and should utilize depending on their context to maximize student learning.

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A Multifaceted Approach to Complex Needs: Targeted Interventions for Gifted Students With Autism

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Recent studies have focused on identification of gifted students with ASD and on their learning experiences; however, there appears to be a gap in the research regarding effective interventions for these students. Most intervention strategies target either the student's giftedness or their ASD diagnosis, but their unique challenges require targeted interventions that extend beyond those designed for students with a single exceptionality of either giftedness or autism. The purpose of this study was to determine the efficacy of targeted, multi-faceted interventions designed to address the complex, often contradictory needs of a gifted student with ASD. The study used a single-subject research design, which took place over the course of two school years. Targeted interventions were designed and implemented to address the specific needs of a 9-year-old male BIPOC student, who had received an ASD diagnosis at age 3, and who was subsequently identified as highly gifted at age 7. A literature review, which looked at the identification of gifted students with ASD and how these dual diagnoses impact their experiences in school, informed the design and implementation of interventions. Practitioners conducted interviews with the student, parent, and teachers, which uncovered differing understandings and expectations that contributed to school avoidance, frustration, and anxiety on the part of the student. In collaboration with the parent, teachers, and student, a series of interventions were designed to address this student's specific needs. Behavioral observations, progress monitoring, and pre- and post-intervention interviews were collected as evidence to determine the effectiveness and relevance of the interventions.

Keywords: Autism Spectrum Disorder, Gifted Education, Special Education, Twice-Exceptional Students

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Introduction

Meeting the educational needs of students with complex learning profiles and multiple diagnosed exceptionalities is challenging even for experienced teachers. Students who are gifted and who also have an Autism Spectrum Disorder (ASD) diagnosis present unique challenges to teachers, as they typically require remedial instruction in some areas yet crave advanced work in other areas. As a result, the learning experiences of gifted students with ASD can be marred by frustration caused by unmet needs or underdiagnosed challenges. Recent studies have focused on the identification of students who are gifted and who also have an ASD diagnosis (Burger-Veltmeijer, Minnaert, & Van den Bosch, 2015). Wo, Lo and Tsai (2019) noted that teachers often focus more on remediation of ASD-related deficits than on nurturing the academic potential, which can lead to frustration and anxiety for the students. Cain, Kaboski & Gilger (2019) identified the underutilization of appropriate services by gifted students with ASD and lack of teacher understanding of the needs of twice-exceptional students as concerns. However, little research has been conducted on how the needs of gifted students with ASD can be effectively addressed. The purpose of this study was to design and evaluate the efficacy of a targeted intervention plan that addresses the specific needs of a 9-year-old male student who is highly gifted and has ASD.

Methods

The study used a single-subject research design, which took place over the course of two school years. Design and implementation of the interventions were informed by the research of Burger-Veltmeijer, Minnaert, and Van den Bosch (2015), Wu, Lo and Tsai (2019) and Cain, Kaboski and Gilger (2019), which looked at the identification of students who are both gifted and have ASD and how these dual diagnoses impact their experiences in school.

Student Profile

The student is a 9-year-old BIPOC male of Filipino heritage. Both his parents were born in the Philippines and immigrated to Canada before he was born. The mother works as an office manager in Vancouver, Canada and is the student's main caregiver. The father is a US citizen who works in Seattle, Washington and commutes home on the weekends. The student was born in Canada and speaks both English and Tagalog at home. The family is also devoutly Roman Catholic.

The student has a complex profile of medical and learning needs. He has a chronic health condition that makes him immunocompromised, which caused particular stress at the onset of the COVID-19 pandemic. At age three, he was diagnosed with a developmental coordination disorder (DCD). At that time, he also received an ASD diagnosis. Subsequently, at the age of seven, he received a psychoeducational assessment and was identified as highly gifted with a Full Scale IQ of 144.

Data Collection

The study used multiple modes of data collection at the pre- and post-intervention stage. Data were collected from interviews, behavioral observations, school attendance, family background, educational history and experiences, and student/parent questionnaires. Pre-intervention data were used to identify the student's current level of performance and specific needs as well as the goals, concerns, and expectations of the student, parent, and teacher. The

information was then used to design targeted interventions. Post-intervention data were then used to evaluate the effectiveness of the interventions and measure the student's overall progress. Weekly debriefing sessions, self-evaluations, and progress monitoring took place during the intervention to determine if and when adjustments and 'fine-tuning' of goals were needed.

Interviews

Interviews were conducted with the student, parent, and teachers, which uncovered differing understandings and expectations that contributed to school avoidance, frustration, and anxiety on the part of the student. The student's early educational experiences and the parent's interactions with the school contributed to concerns about how the student was being supported and impacted the family's relationship with the school, which hindered collaboration.

Early Educational Experiences

In Kindergarten, the teacher focused heavily on social interactions and fine motor skills. The student had not yet been identified as gifted, and therefore he did not receive any enrichment opportunities or acknowledgement of his intellectual abilities. The assumption was that his speech and reading skills were echolalic and hyperlexic. There was also concern that he struggled to draw. For in-school supports, he received speech and language therapy for articulation and occupational therapy for his fine motor skills. The resource teacher led social groups with the student and two of his classmates who also had ASD. However, his high-functioning ASD profile was vastly different from those of the other two classmates, who were quite low-functioning. As a result, the social group activities were well below the student's level of performance and caused a lot of frustration for him. The lack of extending enrichment opportunities further added to his frustration and contributed to him feeling misunderstood. At this time, the mother became very upset that her son's ASD diagnosis meant he was grouped in with students with much more significant needs.

In first grade, the teacher acknowledged the student's advanced math and reading skills and a psychoeducational assessment was recommended. In-school social groups continued as did support from the speech and language pathologist (SLP). Occupational therapy now took place outside of school. At the end of first grade, the parents arranged for a private psychoeducational assessment, which took place during the summer prior to starting second grade. The student was identified as highly gifted, and the second-grade teacher provided enrichment opportunities during Language Arts. The student also began to receive individualized gifted programming in Math and Science. During this time the student and parent became happier about his school experiences. When the school transitioned to online learning at the start of the COVID-19 pandemic, the student received regular one-on-one sessions via Zoom that focused mostly on enrichment.

Expectations and Concerns

As part of a collaborative approach to intervention design, the student, parent, and teachers were all interviewed to determine their expectations and concerns about the student and his education. The interviews revealed significant differences in each person's understandings and priorities. The student's main concerns centered around his gifted label and making sure he was living up to the associated expectations. He continually wanted to know that he was

working at a higher grade level, and he was very concerned about making mistakes, exhibiting perfectionism. The student was also concerned about his social relationships. Due to his sophisticated sense of humor and knowledge of advanced topics, he preferred making connections with adults. However, he expressed a desire to relate to his peers but struggled to do so. These concerns and expectations led to school avoidance, frustration, and anxiety.

The parent, on the other hand, was most concerned about the school's and other students' perceptions of her son. She was worried about him becoming a scapegoat and being blamed for any instance of misbehavior in the class. She was also concerned about a lack of extension activities. She worried that the school was only concerned about her son's ASD and was not prioritizing his giftedness. Finally, despite the parent's sometimes strained relationship with the school, her devout Catholicism meant that she really wanted him to stay in a faith-based school.

The greatest concerns for the teacher were the student's executive functioning and social skills. In particular, the teacher was concerned with the student's lack of organization, independence, and self-regulation. She was also worried about the student "lying" when he told stories or gave accounts that were exaggerated or inaccurate. This was partly due to his black and white thinking and tendency to escalate situations in his head. Another big concern for the teacher was the student's peer relationships. The classroom teacher also had differing expectations of enrichment work than the parent and learning support teacher. She wanted the student to complete all his grade level work before moving on to enrichment activities.

Targeted Intervention Plan

The intervention plan was developed in collaboration with the student, parent, and teachers to address the student's specific needs. Drawing on multiple sources of information, the intervention plan used a collaborative, competency-based, and holistic approach. Interventions were developed to target both the students' giftedness and ASD-related needs.

An important part of the intervention plan was including and valuing the student's input. The student was given agency in the learning process and in selecting math and science topics. This increased the student's engagement and participation as he was able to choose and pursue enrichment opportunities of high interest. The student's giftedness and high level of curiosity often lead him to jump from topic to topic as he feels bored easily and wants to explore new things. As part of working on executive functioning and task perseverance, the student was required to create a plan and step-by-step timeline for every topic he chose. The student then entered into a 'contract' to fully finish the selected topic and related tasks before moving on. This gave the student a sense of responsibility and accountability. By creating a concrete agreement and explaining the purpose and importance of said agreement, there was greater buy-in from the student, who liked having responsibility and felt more 'advanced' because there was a formal plan and 'contract'.

Another central aspect of the intervention plan was clear, ongoing communication with the student, teacher, and parent. A clear explanation of the purpose and goal of each intervention was provided to everyone, including the student. As a highly gifted child, the student is very perceptive and analytical. Therefore, having honest conversations and providing candid explanations were integral in the interventions. To encourage active student participation in interventions, we used the child's passions and post-secondary goals to frame the need for and importance of interventions that he found frustrating or trivial. Communications with the

parents were re-framed in a competency-based, positive manner that placed the student's challenges within the broader context of his giftedness. Student and parent input was a central component of the intervention process in order to increase participation, mitigate anxiety and confusion, foster mutual understanding and 'buy-in', and minimize student frustration and task-avoidance. This involved collaboration in the development of interventions and during ongoing monitoring and adjustments.

In order to address both gifted and ASD-related needs from a holistic perspective, enrichment projects were used as opportunities to nurture gifted potential as well as to work on areas of challenge, including social and conversational skills, turn-taking, emotional regulation, and executive functioning. This provided a strengths-based framework for the student to develop areas of relative weakness. It also gave the student a better understanding of how the areas he finds challenging can contribute and add value to his preferred interests. The student practiced cooperation, turn-taking and conversation skills while discussing enrichment interests and brainstorming research ideas. In enriched science projects chosen by the student, lab reports and case studies were used to help improve written output, planning, and organizational skills. Further, the student's interest in advanced math concepts was used to encourage a growth mindset. While being introduced to unfamiliar, high school-level math topics, the student learned about the zone of proximal development and scaffolding. Using the concepts of scaffolding and zones of proximal development helped the child reframe his mistakes and made him more willing to ask for help. Enriched math was also used as an opportunity to develop planning and organization through multi-step word problems. At home and in the classroom, executive functioning skills were further supported by using checklists and student check-ins. Due to COVID-19 restrictions, playgroups and most social skills activities were not feasible.

Preliminary Results

The record of attendance was compared pre- and post-intervention and showed improvement. In-class observations revealed an increased participation and cooperation with peers following the interventions. Following the implementation of the intervention plan, the student expressed increased enthusiasm to attend school and school-avoidance decreased. The student became more engaged and collaborated in his learning process. There was a large improvement in the student's one-to-one conversational skills, patience, and turn-taking. The student also showed increased self-monitoring and acknowledgement of his executive functioning goals and needs. Similarly, the student showed greater self-awareness of his emotional-regulation needs and a desire to develop coping strategies. What's more, the student exhibited a stronger growth mindset and was more willing to ask for help and admit when he was wrong. There were improvements in the family-school dynamic as well. The parents became more receptive and collaborative with the teachers and school.

Conclusion

The preliminary results indicate the need to consider all factors that are impacting a student's functioning at the pre-intervention stage when designing an intervention plan. Open communication and collaborative, interactive planning with all parties, including the student, parents, and teachers, are key components of effective implementation. Ongoing evaluation and fine-tuning of goals are important to ensure continued efficacy of and engagement in the intervention plan. The results also highlight the importance of promoting student and parent agency throughout the process. Holistic interventions that address both the student's

giftedness and ASD-related needs, such as enrichment opportunities that incorporate goals and activities targeting areas of challenge, have the potential to reduce student frustration and anxiety and increase student participation and buy-in. The targeted, holistic approach outlined here offers an alternative to more traditional strategies that target only one exceptionality or the other, which can result in the child's needs not being fully met.

Acknowledgements

The researcher would like to thank Dr. Erika Forster and Junie Brayley.

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A Critical Comparison of the Lifewide and Lifelong Literacy Practices of Two Adults

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The field of literacy studies has witnessed a paradigmatic shift over the past few decades — from a skills-based paradigm towards one shaped by socio-cultural practices. Informed by this social constructivist turn, this study critically compares and contrasts the lifelong and lifewide literacy practices of two adults (Daiyu and myself). Based on thematic analysis of data collected from a semi-structured interview, this study identified four salient themes: 1) literacy as social practices, 2) multilingualism, code-switching, and translanguaging, 3) digital literacy and multimodalities, and 4) literacy education and societal views of illiteracy. This paper found that despite numerous commonalities of our literacy practices, particularly in the school context, certain nuances still exist owing to our differing identities and life trajectories, notably concerning multilingual and multimodal practices. By analysing our lived literacy experiences through the social lens, this study brings valuable implications for policymakers and educators to interrupt the established meanings and norms of literacy education.

Keywords: Literacy Practices, Multilingualism, Social Turn, Multimodalities

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Introduction

Commonly understood as the ability to read and write (e.g., Blake & Hanley, 1995), the concept of literacy has received considerable academic attention during the past few decades. New Literacy Studies (NLS), framed within a social constructivist epistemology, has contributed significantly to a paradigmatic shift in the field — from a skills-based cognitive approach towards one anchored through the socio-cultural practices individuals engage in (Gee, 2005). Informed by this social turn, the present research compares and contrasts the lifelong and lifewide literacy practices of two adults: a young Chinese lady named Daiyu (pseudonym) and myself. After obtaining voluntary informed consent from Daiyu, I conducted an audio-recorded semi-structured interview (lasting thirty-two minutes) using an interview guide (See Appendix A) formulated in line with the aim of this research. Through an inductive thematic analysis of the interview transcript (See Appendix B), I identified four pertinent themes that permeate her literacy practices: 1) literacy as social practices, 2) multilingualism, code-switching, and translanguaging, 3) digital literacy and multimodalities, and 4) literacy education and societal views of illiteracy. These themes will be analysed in relation to my own literacy practices and the academic literature on literacy studies.

Literacy as Social Practices

I started the interview by asking Daiyu's understanding of reading and writing. Despite her initial conceptualisation of it as "a way of inputting and outputting", which is perceivably a cognitive process, she went on to explain that reading and writing allows her "to understand the world more deeply [...] to express [herself] to the public and individuals". This addition implies that literacy serves a social function by relating people to others and to the world (Burnett & Merchant, 2020; Mace, 2003). Since practices also entail "values, attitudes, [and] feelings" (Barton & Hamilton, 2000, p. 7), I probed Daiyu's idea of what constitutes a good reader and writer. Her response interests me:

> I'm a good reader because I have an accurate understanding of the text I read. Significant misinterpretations are rare [...] I don't think I'm a good writer [...] I don't write much, so I haven't achieved coherence in writing.

Clearly, Daiyu's reflection on her own literacy level neglects the forces of the broader social environment. She seems to subscribe to the *skills-based model*, which reduces literacy to a set of "concrete, measurable skills" (McCormac, 2012, p. 38). This theoretical position has been problematised by the social model endorsed by NLS, which maintains that reading and writing does not make sense without considering its socio-cultural embeddedness (Gee, 2005). Nevertheless, Daiyu's follow-up description of a good writer as someone who "give[s] the reader a rich reading experience" highlights the audience-oriented nature of writing, and hence takes the social aspect into account. As Daiyu also mentioned that she "write[s] comments on other people's social media pages", she reminds me of how I improved my social media productions based on my viewers' comments. This dialogical relation between the author and the reader creates an "intersubjective space" (Glăveanu, 2010, p. 87), in contrast to a process of "individual cognition and coordination" (Duncan & Schwab, 2015, n.p.).

Daiyu's socially situated literacy practices also manifest at her workplace at a design company. Specifically, she learns writing techniques from sample project booklets designed by others in order to craft her own. This emulation of conventions within a shared culture, according to sociohistorical psychology, involves internalisations of previous works and subsequent externalisations of her own creative piece (Moran et al., 2003). I concur with this as in my

academic literacy practices, I consult more knowledgeable others and read their written work in order to polish my own thinking and writing. Corresponding to Lave and Wenger's (1991) *legitimate peripheral participation*, this socially situated learning has facilitated my transition from a novice to a beginner academic in the educational field. My acculturation to disciplinary norms seems to be captured in the *academic socialisation model,* which presumes that students are able to reproduce certain academic discourses without difficulty after socialisations (Lea & Street, 2006). In actuality, I have struggled to meet the institutional preferences dictated by authorities (e.g., tutors and examiners) who hold power over me. In accordance with the *academic literacies model* (ibid.), I have encountered epistemological discontinuities, including those concerning conventions of attribution and critical thinking. Thus, my freedom to represent the world through academic literacy practices are restricted by the socially constructed institutional standards (Ivanič, 2004).

Multilingualism, Code-switching, and Translanguaging

As the data analysis revealed, Daiyu's literacy practices are mediated by different languages, including Chinese, English, and Japanese, in the order of decreasing prominence, and the major site of her multilingual practices is the online space. For someone who has never lived abroad, it is expected that the primary medium is her first language (L1) Chinese, followed by her second language (L2) English. While we share similar linguistic repertoires, our linguistic behaviours differ. I mostly read and write in my L2 English in a cross-border context owing to my current *identity* as a university student taking a reading- and writing-heavy course in the UK and my *imagined identity* (Norton & Toohey, 2011) as a future English-as-a-medium-of-instruction teacher. My L1 Chinese, however, tend to dominate in my informal literature reading and diary-keeping practices. Besides our common L1 and L2, surprisingly, we are both learning Japanese. Just as the prevalence of English as an L2 (Huang, 2018), the popularity of Japanese in China has been historically, politically, and culturally shaped (Otmazgin, 2012). While I study Japanese systematically for academic purposes, Daiyu is motivated by her passion for Japanese animation and literature, as she said:

> I'm interested in one of [the Japanese animations] and found its original novel. Although I'm not a serious learner and my level is mediocre, I read the Japanese novel slowly with a translator while trying to understand the words.

Out of an intrinsic desire to understand Japanese cultural products, Daiyu picks up the language in an informal manner through investment in Japanese-mediated reading practices. When conversing with people from Japanese-speaking or learning backgrounds, their shared linguistic capital allows "concise communication" as if they are "people in the same cultural circle" (Daiyu). Her incorporation of Japanese vocabulary in Chinese- or English- dominant interactions mirrors my multilingual literacy practices. As a direct consequence of receiving English-medium education, translating certain words such as "moodle" and "handbook" into Chinese is deemed unnatural. Thus, during my socialisations with fellow Chinese international students, *intra-sentential code-switching* (Myers-Scotton, 1998) frequently takes place, where we spontaneously shuttle between English and Chinese within a sentence. This not only eases our meaning-making efforts, but also reflects our collective identity as overseas Chinese students.

Related to our explicit behaviours of code-switching is the mechanism of translanguaging, whereby we use our full linguistic repertoire to achieve a communicative aim (Creese & Blackledge, 2015; García & Kleifgen, 2010). For Daiyu, with the primary purpose of sharing ideas with fellow Japanese culture enthusiasts across the globe, she deploys different linguistic

resources available (e.g., Chinese, English, and Japanese) to optimise meaning conveyance. Similarly, as a part-time English tutor, I avoid a strict English-only pedagogy and strategically use translanguaging, where students' whole linguistic system is activated to enhance their communicative competence and metalinguistic awareness (Cenoz, & Gorter, 2020). While Daiyu seems to interpret language in a narrow linguistic sense, I embrace the view that language is "any system that uses systematic codes, symbols or signs [...] for purposes of communication and interaction" (Mkandawire, 2018, p. 42). This conceptualisation brings me to the next emergent theme.

Digital Literacy and Multimodalities

Reminiscent of what Mills (2010, p. 246) calls the "digital turn", a significant example of contemporary literacy practices is digital literacy. Based on the interview data, Daiyu participates actively in online activities, including reading blog articles, writing comments, and chatting with colleagues on instant-messaging tools. These practices coincide with mine as both of us are "digital natives", who grew up interacting with technology (Prensky, 2001, n.p.). Nevertheless, we agree that when we were young, paper-based materials such as textbooks served as our central mediation tools. Our shift towards screen-based practices, as pointed out by Daiyu, can be attributed to "identity and environmental changes", where we transitioned from school to university and workplace, respectively, amid rising penetration of digital technologies in most facets of our lives.

Linked to the previous theme, Daiyu's participation in multilingual practices has been transformed by the new communicational landscape made possible by digital technologies. As argued by Darvin (2017) and Norton (2015), social media and the Internet empower language learners to partake in a broader range of multilingual communities and claim themselves to differing extents as legitimate speakers. Indeed, the virtual environment allows Daiyu to construct her identity as a Japanese language user by providing a more fluid and non-hierarchical space for her to share insights on the Japanese culture and learn Japanese through interactions with her Internet peers. Therefore, compared to my classroom-based English learning experiences ten years ago in China, Daiyu's current language use in the "globalised, online affinity spaces" (Hafner et al., 2015, p. 3) is more authentic and less subject to standardised requirements.

Another prominent feature of our digital literacy practices is the use of multiple modes, such as "image, sound, touch, [and] multi-dimensions" (Rowsell & Walsh, 2011, p.54). As noted by Anttila et al. (2014), people's choices of modes are informed by their desires and affordances of modes, where *affordances* is defined as "what it is possible to express and represent readily, easily, with a mode, given its materiality and given the cultural and social history of that mode" (Kress & Jewitt, 2003, p. 14). Different from Daiyu's text-based literacy practices, I spend more time listening to audio books and podcasts so as to minimise digital eye strain. This engagement with the auditory mode is also salient in my media production, where I regularly create podcasts about my study-abroad journeys. Through the affordances of digital media, I feel that I am endowed with "the same tools that professional artists, craftspeople and engineers use" (Burn, 2016), as my works have not only been widely distributed and recognised, they have also positively impacted my audiences' lives according to the comments I received.

Daily digital literacy practices aside, Daiyu also talked about her multimodal practices at her design company. As party B, she has to "introduce and elaborate on a design concept" drafted "according to the requirements given by party A" (Daiyu). In order to deliver informative and

appealing slide presentations to her clients (i.e., party A), Daiyu draws from the repertoire of her representational resources and her sense of the clients' needs and interests. Her decisions probably include the choices of different fonts, the logical use of space, and her movements and gestures. Similarly, I also utilise a variety of modes in composing my academic essays. For example, I tend to bold subheadings to make them more conspicuous and insert diagrams to better illustrate certain educational theories. As claimed by Barton and Hamilton (2000, p. 9), "people use written language in an integrated way as part of a range of semiotic systems", these arrangements of various elements demonstrate our dynamic multimodal literacy practices. While we both appropriate nonlinguistic semiotic resources, this appears more apparent in Daiyu's practices due to her role as an arts designer and less in mine probably because the conventional information carrier in academic writing of education studies is text.

Literacy Education and Societal Views of Illiteracy

Based on the interview data, I noticed a marked contrast between Daiyu's in- and out-of-school literacy practices, with the former being "standardised" and "rigid" and the latter having "no fixed way" (Daiyu). My literacy education resonates with hers as we share similar schooling experiences in the Asian educational contexts. The Singaporean secondary school system, which I have gone through, for instance, places considerable emphasis on the mastery of literacy. The acquisition of globally acceptable English as a "common standard for every student in the classroom" is underscored in our English Language Syllabus (MOE, 2020, p. 13). In this sense, learners' existing knowledge and know-hows, as well as their heterogeneity, are sidelined. Additionally, as Daiyu mentioned that she was taught how to analyse passages and write compositions in a fixed format, this reminds me of how syntax and morphological rules were transmitted to students during my literacy education in Singapore. Moreover, international students like me were offered additional English reading and writing lessons as solutions to fix our language problems. All these align with the *study skills model*, which stresses the surface features of language form and aims to remediate students' deficits while disregards the situatedness of literacy practices (Lea & Street, 2006; Zhang, 2011).

Although Daiyu agreed that "all forms [of literacy] are equal", she acknowledged that "some are more emphasised, valued, and cultivated" in her society. This implies the contested nature of the meanings and practices of literacy, as certain versions dominate and marginalise others (Gee, 2015; Street, 1984). Furthermore, Daiyu noticed that her society "look[s] down on the so-called uneducated people" and "the most obvious manifestation of the uneducated is their poor reading and writing abilities". This taken-for-granted association between low literacy levels and being "uneducated" is captured in what Street (1984) terms the *autonomous model* of literacy, which suggests that introducing literacy to the illiterate will automatically improve their cognitive ability and socio-economic prospects. Mkandawire (2018, p. 37) questions this context-independent demarcation and notes that "everybody in a broader sense is literate and illiterate in some area". This way of looking at literacy is further supported by Luebke (1966), who posits two conditions for a person to be considered literate: first, he has learnt to read and write; and second, he lives in an empowering society where his literacy can be utilised to benefit himself and his community. I embrace this view as it not only reveals how dominant forms of literacy silence others in our ideologically driven societies, but also alludes to the possibility of constructing a more inclusive understanding of literacy in our communities.

Discussions and Conclusions

Grounded in the paradigm that engages with literacy as a social practice, this study has critically analysed the lifewide and lifelong literacy practices of Daiyu and me. By considering four interlinked themes that emerged from the interview, it has been found that our literacy practices cut across different domains, including work, literature, social media, informal language learning, and formal education, and have changed from more print-based to screen-based ones. It is worth noting that although literacy is traditionally believed to be a decontextualised technical capability (Luke & Woods, 2009), both of our practices testify to the perspective that "thinking is not 'private', but almost always mediated by cultural tools" (Gee, 2005, p. 3) and the broader socio-cultural contexts. Despite many similarities found in our literacy practices, notably school literacy education, due to our shared cultural and generational backgrounds, numerous nuances still abound owing to differences in our identities and life trajectories, particularly those concerning multilingual and multimodal practices.

One interesting feature of the findings is that Daiyu did not mention her practices of more functional literacies (Mkandawire, 2018), such as reading road signs and price tags. Types of literacy practices she often cited are those closely associated with work and education, followed by her informal language learning. Moreover, when probed about the changes in her literacy practices, Daiyu said that she "do[es] less reading and spend more time reading social media platforms". This implies that certain forms are still not fully embraced as real literacy practices and that dominant types in line with the interests of the powerful are well-entrenched in her consciousness. Another noteworthy point lies in the recurrent concept of identity, which is reflected and constructed through our socialisations and intimately tied to our situated contexts.

While this study is framed in the social constructivist approach adopted by New Literacy Studies (NLS), theories from other socially oriented movements, such as sociohistorical psychology and situated cognition have also been used to substantiate the analysis. Nevertheless, due to a lack of follow-up interviews and participant validation of data, some of the analysis could be subject to my own interpretations. Moreover, the interview questions I crafted and the responses from Daiyu could also be influenced by my positionality as a university student majoring in Education and my familiarity with Daiyu. That said, by considering the socio-culturally nested feature of literacy and our dynamic real-life literacy practices, this study brings valuable practical and pedagogical implications for schools to reconsider and transform the role of literacy education. For instance, in light of the diverse range of literacy events occurring in our everyday experiences, policymakers and educators could extend schools' categorisation of literacies from a narrow focus on reading and writing to multiple forms including digital ones. In addition, given the perceived legitimacy of dominant versions of literacy, sessions on a socially situated nature of literacy could be delivered to empower students to embrace the varied literacy practices close to their everyday lives.

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Appendices

Available online: https://papers.iafor.org/papers/iice2022/IICE2022_61771_appendix.pdf

Sandwich With a Side of Motivation: An Investigation of the Effects of the Feedback Sandwich Method on Motivation

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The "feedback sandwich" method involves placing corrective feedback between two positive statements. Although it has been argued that this method is an effective means of delivering feedback to students because it seemingly makes constructive feedback more pleasant (e.g., Dohrenwent, 2002), there exists limited empirical research to support this claim. Receiving feedback from instructors has implications for a host of perceptual and behavioral variables for students. The limited body of empirical research on the feedback sandwich method provides evidence that while this method is associated with perceived usefulness and effectiveness (e.g., Davies & Jacobs, 1985), its use may not influence subsequent performance (Prochazaka et al., 2020). This study examines the effects of feedback sequencing on motivation using an experimental design in a sample. Results indicate the feedback sandwich method had no effect on self-reported motivation levels. Results are discussed with regard to their applied and theoretical implications.

Keywords: Feedback Sandwich, Student Motivation, Feedback Sequencing

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Introduction

Student motivation is a key predictor of a host of desirable educational outcomes including performance, learning, and self-efficacy (e.g., Lim, 2004; Razak & See, 2010). It is unsurprising, then, that motivation is a key construct in the study of teaching and learning. Although motivation may derive from a host of internal variables within students (e.g., interest in topic, use of technology in a class), one major way in which motivation may be incited is through the behaviors of instructors, namely feedback on class assessments.

Feedback is an essential part of the learning process and often provides students with a framework for improvement, as well as an explication for their quantitative grade. While instructor feedback can enhance student motivation, it may also have the adverse effect. Hattie and Timperley (2007) argue that "feedback is one of the most powerful influences on learning and achievement, but this impact can be either positive or negative". Such a statement points to the crucial role that message framing plays in the generation of positive educational outcomes. Thus, the question arises, how might instructors frame messages in order to facilitate positive educational outcomes within students?

One possible way instructors may frame messages to promote positive outcomes is through the use of the "feedback sandwich" method. This method involves placing corrective feedback between two positive statements (Dohrenwent, 2002). Although it has been argued that this method is an effective means of delivering feedback to students because it seemingly makes constructive feedback more pleasant (e.g., Dohrenwent, 2002; Schwarz, 2013), there exists limited empirical research to support this claim (for exceptions, see Davies & Jacobs, 1985; Dolan, Covert, Fleming, & Keppel, 2021; Henley & Reed, 2015; Parkes et al., 2013; Prochazaka et al., 2020).

The purpose of the current study is to examine the effects of feedback sequencing on motivation in effort to provide empirical evidence for the effectiveness of the sandwich method, with regard to student motivation. Furthermore, of the limited body of research on the sandwich method, few studies have examined all potential combinations of feedback sequencing. The current study seeks to look at all potential combinations of feedback statements in effort to provide a more robust test of the method. By examining the effects of feedback sequencing on motivation, potential mediators on the feedback-performance relationship may be elucidated. The implications of such findings would likely have important theoretical and applied implications.

Feedback and the Feedback Sandwich Method

The current study defines instructor feedback refers as instructor-based comments on student work provided with the goal of enhancing students' academic performance (Mulliner & Tucker, 2017). Often, when delivering feedback to students, instructors often employ both positive and corrective statements. These positive and corrective statements may be a general comment about a student (e.g., "you have a lot of potential") or a specific comment about the student's performance on the assignment (e.g., "you demonstrate a good understanding of the concept.").

The sequencing of positive and corrective statements may be an important factor predicting the effectiveness of the feedback in relation to student perceptions, motivation, and performance. The feedback sandwich method, which focuses on the sequencing of feedback statements, has

garnered a considerable amount of attention in the popular press as a method to enhance a host of student-related variables (e.g., Dohrenwent, 2002; Schwarz, 2013). This method proposes that placing corrective feedback in between pieces of positive feedback is more effective at generating positive student outcomes compared to other sequences (e.g., two positive feedback statements followed by constructive feedback).

The feedback sandwich method has argued to be more effective at generating positive student outcomes compared to other sequences. However, while widely discussed in the popular press as an effective means of providing feedback (e.g., Dohrenwent, 2002; Schwarz 2013), the feedback sandwich method has not generated much empirical research to date. The limited studies in this area suggest that feedback sandwich leads to higher levels of student-reported perceptions of usefulness and effectiveness, compared to other feedback sequences (e.g., Davies & Jacobs, 1985), but may not be as effective at influencing actual performance in a class (e.g., Prochazaka et al., 2020). Overall, this body of literature suggests that feedback sequencing may influence student perceptions of the feedback itself, but perhaps not performance. With regard to the effects of sequencing on perceptions, the cognitive processes through which feedback influences perceptions remain unclear.

Additionally, the scant body of research in the area of the feedback sandwich method rarely examine all potential combinations of feedback sequencing. Typically, studies looking at the effects of the feedback sandwich typically employ three experimental conditions: (1) Sandwich feedback, (2) Positive-first feedback, and (3) Constructive first feedback without considering how the ordering of specific positive statements may influence perceptions, motivation, and performance. As previously argued, however, a major way in which statements may vary is with regard to specificity and generality; that is, we might see different effects based on the ordering of specific positive and general positive statements.

The Current Study

Few studies have examined all potential combinations of sequencing. In addition, no studies to date have looked at the effects of the feedback sandwich method on motivation. By examining the effects of sequencing on motivation, potential mediators in the feedback-performance may begin to be elucidated. The implications of such findings would likely have important theoretical and applied implications.

This study examines the effects of feedback sequencing on motivation while examining all possible combinations of feedback sequencing. The following research question guides this study:
RQ1: Does the ordering of general and specific feedback statements impact perceptions of motivation?

Secondly, the current study also examines the effect of feedback sequencing on self-reported motivation. In light of the literature on the sandwich method (e.g., Davies & Jacobs, 1985; Dohrenwent, 2002; Prochazaka, Ovcari, & Durinik, 2020), the following hypothesis is proposed:
H1: The feedback sandwich method will lead to higher levels of self-reported motivation in class compared to other sequences of feedback.

Methodology

Design and Procedures

A total of 155 participants took part in this between-groups experimental study. Participants were recruited from undergraduate classes at a mid-sized public university in the Northeast United States. Participants ranged in age from 18 to 23 and were mostly female (64.90%).

Data were collected through Qualtrics, an online survey platform. Upon their recruitment to this study, participants were told that the focus of the study was on the effects of instructor feedback on cognition and emotion.

Participants were told to envision a hypothetical situation in which they were taking a class which required the completion of two papers, each worth 25% of their grade. They were then told that they received their grade for the first paper, which was a 60%. Participants were then presented with their feedback on this assignment. At this point, participants were randomly assigned to one of six feedback conditions. Together, these six conditions represented all possible combinations of feedback sequencing. The two positive feedback statements in this study read, “The structure of your paper is good” (specific statement) and “You have the potential to do good work” (general statement). The corrective feedback statement was as follows: “Your understanding of the content is incorrect” (see Table 1 for all feedback condition messages) To enhance the ecological validity of the current study, we presented the grade and feedback in a format consistent with that of the learning management platform used at the institution at which data were collected (see Figures 1 and 2 for sample experimental stimuli).

Condition	Ordering	Condition Message
Sandwich (1)	Positive General Constructive Positive Specific	You have the potential to do good work. Your understanding of the content is incorrect. The structure of your paper is good.
Sandwich (2)	Positive Specific Constructive Positive General	The structure of your paper is good. Your understanding of the content is incorrect. You have the potential to do good work.
Constructive First (1)	Constructive Positive General Positive Specific	Your understanding of the content is incorrect. You have the potential to do good work. The structure of your paper is good.
Constructive First (2)	Constructive Positive Specific Positive General	Your understanding of the content is incorrect. The structure of your paper is good . You have the potential to do good work.
Positive First (1)	Positive General Positive Specific Constructive	You have the potential to do good work. The structure of your paper is good. Your understanding of the content is incorrect.
Positive First (2)	Positive General Positive Specific Constructive	The structure of your paper is good. You have the potential to do good work. Your understanding of the content is incorrect.

Table 1: Condition Messages

Please imagine the following scenario:

You are taking a writing-intensive class for your major this semester. For this class, you must write two papers. Each paper is worth 25% of your final grade. Last week you submitted your first paper to D2L. Today when you logged onto D2L, you receive the following alert for the class:

"Paper 1" updated. Your grade is: 60 %

Figure 1: Grade Message

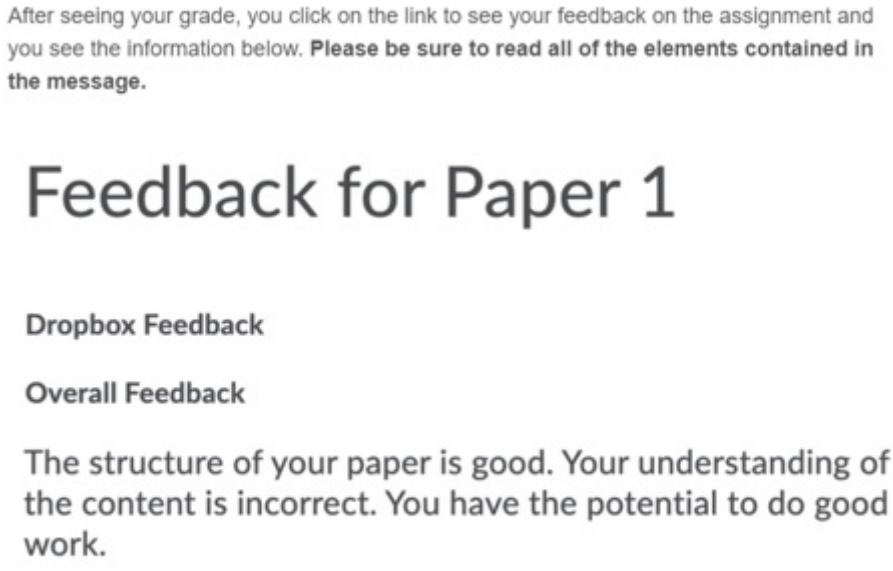

Figure 2: Sample Condition Message (Sandwich Condition 2)

Measures

In order to understand if feedback sequencing had an effect on motivation, after reading their condition feedback messages, participants completed an adapted version of Beatty and Payne's (1985) Motivation Scale. This scale used 12 items measured on 7-point bipolar response scales, with higher numbers representing higher levels of motivation (M = 3.89, SD = 1.13, α = .88).

We also controlled for both positive and negative emotion, as emotion may confound the feedback-motivation relationship. We measured positive and negative emotion separately using the Positive and Negative Emotion Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). This scale utilizes 10 items to measure positive emotion and ten items used to measure negative emotion. Both scales are measured on 5-point Likert-type scales ranging from *slightly or not at all* to *extremely* (Positive emotion: M = 2.25, SD = 0.65, α = .79; Negative emotion: M = 3.36, SD = 0.86, α = .88).

Results

RQ1: Ordering of General and Specific Feedback Statements

A major purpose of this study was to examine whether or not the type of positive statement (i.e., general, specific) had an impact on motivation. As a result, we designed six experimental conditions in the current study. These six conditions represented two variations of the sandwich method, two variations of positive first feedback, and two variations of constructive first feedback. To examine whether or not the type of statement impacted the feedback-motivation relationship, we conducted a series of independent sample t-tests (see Table 2 for means based on condition).

	Motivation			Positive Emotion			Negative Emotion		
	M (*SD*)	*t* (*df*)	*p*	*M* (*SD*)	*t* (*df*)	*p*	*M* (*SD*)	*t* (*df*)	*p*
Sandwich (1)	3.677 (1.05)	-1.06 (41)	.30	2.18 (0.62)	1.06 (42)	.30	3.36 (0.65)	0.74 (42)	.47
Sandwich (2)	4.12 (1.11)			2.38 (0.67)			3.17 (1.03)		
Constructive First (1)	3.86 (1.18)	-0.25 (44)	.80	2.13 (.59)	0.17 (44)	.86	3.55 (.79)	1.71 (44)	.10
Constructive First (2)	3.95 (1.27)			2.10 (0.55)			3.16 (.77)		
Positive First (1)	3.60 (1.16)	-0.83 (40)	.41	2.25 (0.48)	1.01 (40)	.32	3.54 (0.78)	0.59 (40)	.56
Positive First (2)	3.89 (0.99)			2.09 (0.57)			3.37 (1.04)		

Table 2: Condition Means and Results of T-Test

First, we examined whether or not motivation scores varied based on our two sandwich conditions. Results of this t-test demonstrated that no differences existed ($t(41) = -1.06$, $p = .30$) . Therefore, the ordering of general and specific statements in the sandwich method had no impact on motivation. Next, we explored whether or not mean differences existed in motivation scores for our two positive first conditions. Results of this t-test demonstrated that no differences existed ($t(44) = -0.25$, $p = .80$). Therefore, the ordering of general and specific statements in a positive feedback first sequence had no impact on motivation. Finally, we explored whether or not mean differences existed in motivation scores for our two constructive first conditions. Results of this t-test demonstrated that no differences existed ($t(40) = -0.83$, $p = .41$). Therefore, the ordering of general and specific statements in a constructive feedback first sequence had no impact on motivation. A similar pattern of results was identified for positive and negative emotion (see Table 2).

Because no differences were identified in our sandwich, positive first, and constructive first conditions, we then collapsed our six conditions into three in order to enhance our statistical power. As a result, the subsequent analyses are run on three conditions: (1) Sandwich feedback sequencing; (2) Positive first feedback sequencing; and (3) Constructive first feedback sequencing (see Table 3 for condition means for collapsed conditions).

Condition	Motivation *M* (*SD*)	Positive Emotion *M* (*SD*)	Negative Emotion *M* (*SD*)
Sandwich (PCP)	3.93 (1.08)	2.27 (0.64)	3.27 (0.84)
Constructive First (CPP)	3.94 (1.22)	2.11 (0.56)	3.35 (0.80)
Positive First (PPC)	3.74 (1.08)	2.18 (0.52)	3.46 (0.91)

Table 3: Condition Means for Collapsed Conditions

H1: Testing the Effects of the Sandwich Method on Motivation

Our hypothesis stated that the sandwich method would lead to higher levels of motivation compared to other sequences (i.e., positive first, constructive first). Additionally, because literature demonstrates that emotion correlates with sequencing and motivation (e.g., Dolan et al., 2021), we controlled for both positive and negative emotion (See Table 4 for correlations among scales). To explore the effects of sequencing on motivation, then, we ran a linear regression in which the effects of feedback sequencing on motivation was examined.

	Motivation	Positive Emotion	Negative Emotion
Motivation	1.00	.57*	-.22*
Positive Emotion	.57*	1.00	.10
Negative Emotion	-.22*	.10	1.00

Note. * denotes significance at p > .05.

Table 4: Correlations Among Emotion and Motivation Variables

First, we dummy coded the collapsed feedback sequencing conditions into three groups: (1) Sandwich; (2) Positive first; and (3) Constructive first. Also in the regression model, we controlled for possible confounding variables including positive and negative emotional responses of receiving feedback.

The overall regression model was statistically significant (Adj. R^2 = .40, $F(4, 145) = 25.87$, $p < .001$). However, in our model, we did not find an effect for the feedback sandwich (Constructive First $B = .25$, $\beta = .10$, $p = .14$); Positive First $B = .06$, $\beta = .02$, $p = .74$). Therefore, H1 was not supported; the feedback sandwich did not lead to higher levels of motivation compared to other conditions.

Positive and negative emotion, which were added to the model as control variables, were found to influence motivation (Positive Emotion: $B = 1.08$, $\beta = .62$, $p < 0.01$; Negative Emotion: $B = -.39$, $\beta = -.28$, $p < 0.01$). Therefore, both positive and negative emotional responses influenced levels of motivation such that the more positive emotion one experienced, the more motivated they felt, and the more negative emotion they experienced, the less motivated they felt.

Discussion

The purpose of this study was to examine the effects of feedback sequencing on motivation while considering all possible combinations of feedback sequencing. Results of the current study provided no evidence that the ordering of general and specific positive feedback impacted motivation, negative emotion, or positive emotion. Thus, results of the current study provide no evidence that placing specific feedback before general feedback (and vice versa) have an impact on self-reported emotion and motivational variables. Such a finding has important implications for future studies, as these findings suggest that researchers can employ fewer experimental conditions in their examinations of the feedback sandwich method.

Of central interest to this study was the effect of feedback sequencing on self-reported motivation. It was specifically predicted that the feedback sandwich method would generate higher levels of motivation compared to other conditions (i.e., positive feedback first, constructive feedback first). Interestingly, this study failed to find an effect for the sandwich method on motivation. The feedback sandwich method, did, however, demonstrate effects on self-reported positive and negative emotion.

In addition to not influencing actual performance (i.e., Prochazaka et al., 2020), findings from the current study provide evidence that the feedback sandwich method also does not influence motivation. These findings, taken together with the general body of research suggests that while students might perceive the feedback sandwich method to be more useful and of better quality (i.e., Davies & Jacobs, 1985), these perceptions do not go on to influence other motivational and behavioral variables. Therefore, the body of empirical literature largely suggests that the feedback sandwich method's success may not transcend outside of the popular press.

Our failure to detect and effect of feedback sequencing on motivation may be explained by our study's one-shot design. In the current study, students were presented with a single scenario in which they were presented with feedback. It may be the case that the method is most effective in situations where students receive a series of feedback on repeated occasions. A longitudinal design would allow for an examination of such a possibility.

Another possibility is that the feedback sandwich method may work in some situations but not others. For instance, the current study examined written verbal feedback provided to students on a learning management platform. It may be the case that the feedback sandwich works better in face-to-face, compared to online scenarios. Future studies should explore that possibility. Another possible situational variable that may influence the feedback sequencing – motivation relationship may be the type of class in which the feedback is received (e.g., major class versus liberal studies class).

Conclusions

While the feedback sandwich method has generated a great deal of attention and praise in the popular press, few empirical studies support the idea that the feedback sandwich method is students' most preferred and effective method of receiving feedback. Results of the current study corroborate these findings and suggest that the sequencing of feedback statements has little to no impact on student's motivation.

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An Empirical Investigation of Feedback Sequencing on Emotion Regulation Processes

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The effects of receiving feedback on course assessments have emotional implications for students (e.g., Ryan & Henderson, 2018) that extend to motivation and behavior (Boud & Falchilvov, 2007). Receiving negative feedback, then, may have harmful effects on students' emotions, motivation, and performance. A way in which students' emotions may be regulated is through employing the "feedback sandwich" (Dohrenwent, 2002). The method focuses on variability in feedback ordering, and specifically holds that "sandwiching" constructive feedback in between two positive statements is the most effective way to deliver negative feedback to students. While widely discussed in the popular press, there exists little empirical research on the effectiveness of method, and to date, only one study has examined the effects of the feedback sandwich on emotion regulation. This study presents an empirical test of the effects of feedback sequencing on emotion regulation. Results indicate that the sandwich method did not have an effect on either positive or negative emotion. Results are discussed in light of their theoretical and applied implications for feedback sequencing.

Keywords: Feedback Sequencing, Feedback Sandwich, Emotion Regulation

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Introduction

Receiving feedback from instructors can be an emotion-inducing experience for students. The effects of these emotional experiences may influence a host of educational outcomes, such as performance and motivation (e.g., Boud & Falchilvov, 2007). Receiving negative feedback, then, may have harmful effects on students' emotions, motivation, and performance. Thus, it is important to understand how students' negative emotions may be regulated when receiving negative feedback.

A way in which students' negative emotions may be regulated is through employing the "feedback sandwich" (Dohrenwent, 2002). The method focuses on variability in feedback ordering, and specifically holds that "sandwiching" constructive feedback in between two positive statements is the most effective way to deliver negative feedback to students.

While widely discussed in the popular press, there exists little empirical research on the effectiveness of method, and to date, only one study has examined the effects of the feedback sandwich on emotion regulation. While this study failed to find an effect of the feedback sandwich, the study lacked sufficient power to detect an effect, which may explain the findings (Dolan, Covert, Keppel, & Fleming, 2021). This study presents an empirical test of the effects of feedback sequencing on emotion regulation in a sample of college students.

Feedback and Emotion

Emotions are produced when individuals feel that a stimulus in their environment (in this case, feedback on an assignment) relates to their goals (Lazarus, 1991). Under normal conditions, students have the goal of doing well in a class, which includes receiving good grades and having a command of the course content. Receiving feedback from their instructors is a major way in which students can learn about their goal pursuit.

Negative emotions, according to Lazarus (1991), arise when one's goal pursuit is thwarted, and may result in emotions such as anxiety, sadness, grief, and despair. A common feature of these emotions is that they are experienced when a situation is perceived as harmful to one's own goal pursuit or values. In the case of the current study, negative emotions likely arise when instructor feedback indicates that the student did not perform well on an assignment.

On the other hand, students experience positive emotions when they believe that they have made progress toward a goal (Lazarus, 1991). Resulting emotions from goal progression may include happiness, joy, or excitement. A common feature of these emotions is that they are experienced when a situation is perceived as beneficial to, or congruent with, one's own goals or values.

A second way in which a situation, and in this case, feedback, may influence emotion is through the extent to which a situation is more or less congruent with their goals. That is, the more incongruent a situation is with one's goals, the less intensely one will experience the positive, or negative emotion. Alternatively, the more incongruent a situation is with one's goals, the more intensely one will experience the positive, or negative emotion.

In many cases, and following hedonistic principles, people tend to want to continue, or enhance, their experience of positive emotions, and discontinue, or diminish, their experience of negative emotions (Gross, 1998). Although individuals may enhance or diminish their

emotional experiences on their own, outside factors may also help individuals alter their emotional experiences (e.g., Thayer et al., 1994; Rimé, Philippot, Boca, & Mesquita, 1992). Therefore, the nature of instructor feedback may be a powerful force in regulating the emotions of students when receiving feedback.

Emotion Regulation

Instructor feedback may be a powerful force in producing emotional experiences in students, and these experiences may go on to have the ability to impact performance, motivation, and cognition. (e.g., Boud & Falchilvov, 2007). Therefore, it is worthwhile to explore feedback has the potential to incite emotion within targets, and that these emotions may impact a host of cognitive, motivational, and behavioral variables, it is worth exploring how negative emotions resulting from feedback may be mitigated. A useful theoretical paradigm to better understand how emotions may be altered is that of emotion regulation. Gross (1998) developed the process model of emotion regulation to explain the process that occurs when individuals alter the "emotions they have, when they have them, and how they experience and express them" (Gross 1998b, p. 275).

Although typically examined as an intrapersonal process, considerable research suggests that communication is a principal vehicle through with emotion regulation processes occurs, and further indicates that communication messages have the ability to regulate emotion (e.g., Cannava, High, Jones, & Bodie, 2018; Hersh, 2011; Holman & Niven, 2019; Rimé, Finkenauer, Luminet, Zech, & Philippot, 1998; Williams, Morelli, Ong, & Zaki, 2018). Thus, in the context of this study, variations in instructor feedback messages may have the ability to regulate or mitigate negative emotion associated with receiving feedback.

The Feedback Sandwich

Of course, the language of the feedback will have an influence on emotion regulation processes within students. Another possible route to inciting emotion regulation processes within students is the sequencing of feedback statements. Feedback sequencing refers to how both positive and corrective feedback statements may be strategically ordered to enhance effectiveness.

In the popular press, the feedback sandwich method has attracted a great deal of attention (e.g., (Dohrenwent, 2002; Schwarz, 2013). The feedback sandwich method focuses on variability in the sequencing of positive and corrective feedback, and specifically argues that sequencing can have profound effects on a host of educational variables, including student perceptions (e.g., self-efficacy), motivation, and performance.

According to Dohrenwent (2002), sandwiching corrective feedback statements in the middle of positive feedback statements is considered more effective for recipients compared to other orderings (e.g., two positive feedback statements followed by corrective feedback). Emotion plays a central role in the success of this method; Inherent in this process is emotion; employing this particular sequencing is argued to lead to fewer negative emotional experiences compared to other sequences of feedback (e.g., Schwarz, 2013).

As mentioned previously, the feedback sandwich has been widely discussed in popular press (e.g., Dohrenwent, 2002; Prochazaka, Ovcari, & Durinik, 2020; Schwarz 2013). However, the method has not generated much empirical research to date. The limited number studies

conducted on instructor feedback sequencing and receiver perceptions suggest that the feedback sandwich method increases receiver judgements related to the usefulness and effectiveness of feedback than other sequences of feedback (e.g., Davies & Jacobs, 1985), but may not be effective as other sequences at inducing improved student performance (e.g., Parkes, Abercrombie, & McCarty, 2013; Prochazaka et al., 2020). Overall, the primary agreement among the small amount of available research suggests that feedback sequencing may affect judgments within receivers; however, the processes through which this relationship occurs is largely unclear.

With regard to emotion, to date, only one study has examined the effects of the feedback sandwich on emotion regulation (Dolan et al., 2021). While this study failed to find an effect of the feedback sandwich, the study lacked sufficient power to detect an effect, which may explain the findings.

The Current Study

The current study seeks to explore the following question: Does feedback sequencing affect students' emotional experiences? In this between-groups experiment, we vary the sequencing of three feedback statements and to examine the effects of sequencing on emotion regulation processes. Based on literature, originating from both popular press and the academic literature, we propose the following hypotheses:

H1: The feedback sandwich method will lead to lower levels of self-reported negative emotion compared to other feedback sequences.

H2: The feedback sandwich method will lead to higher levels of self-reported positive emotion compared to other feedback sequence conditions.

Methodology

Design and Procedures

A total of 288 participants took part in this between-groups experimental study. Participants were recruited from undergraduate classes at a mid-sized public university in the Northeastern United States. Participants ranged in age from 18 to 34 and were mostly female.

Once agreeing to participate in this study, participants were told that this survey focused on the effects of feedback on emotion and cognition. Participants were asked to imagine a hypothetical scenario in which they were taking a class and needed to complete two papers, each worth 25% of their grade. They were then told that when they logged into their learning management site, they received a grade on their first. Next, participants were told to further imagine that they clicked a link to feedback for their assignment. It is at this point that participants were randomly assigned to one of six feedback conditions representing all possible combinations of the following statements.

Participants were randomly assigned to one of seven conditions. Six conditions represented all possible sequences of two positive feedback statements and one constructive feedback statement. The two positive feedback statements were as follows: "The structure of your paper is good" and "You have the potential to do good work". The corrective feedback statement was as follows: "Your understanding of the content is incorrect". A seventh

condition served as a control condition. This condition did not present participants with any qualitative feedback.

To test for the emotion regulation effects of feedback sequencing, all participants completed emotion measures after they read their condition messages. Doing so allowed us to test for emotion differences between groups. Systematic differences between groups would signify that the feedback sequencing had a distinct effect on emotion regulation processes. To account for possible confounding variables, we also controlled for emotion regulation variables including tendencies to regulate through cognitive appraisal and suppression, as well as difficulties in emotion regulation.

Measures

To examine emotion, we used the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) to understand the types of emotions participants experienced after reading the feedback. This scale uses 20 items rated on five-point Likert-type response scales ranging from *very slightly* or *not at all* to *extremely* to examine 10 positive and 10 negative emotions. The ten items used to measure positive emotion were combined into a single scale and the ten items used to measure negative emotion were combined into a single scale. See Table 1 for reliabilities and descriptives.

Control variables included cognitive reappraisal and expressive suppression emotion regulation tendencies and difficulties in emotion regulation. The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was used to measure the two facets of emotion regulation: cognitive reappraisal and expressive suppression. We measured difficulties in emotion regulation using the Difficulties in Emotion Regulation – Short Form (DERS-SF; Kaufman, Xia, Fosco, Yaptangco, Skidmore, & Crowell, 2015), which uses 18 items to measure participants' trait difficulties in managing their emotions. Reliabilities and descriptives for all scales used in the study are found in Table 1.

	N	*M* (*SD*)	α
Positive Emotion	*281*	2.25 (0.62)	.76
Negative Emotion	281	3.32 (0.87)	.88
Cognitive Reappraisal	286	4.84 (1.04)	.83
Expressive Suppression	286	3.97 (1.29)	.87
DERS	285	2.62 (0.59)	.77

Table 1: Reliabilities and Descriptives

Results

Collapsing Conditions

Six experimental conditions represented all possibilities of feedback sequencing. As a result, two conditions represented the sandwich method, two conditions presented of positive feedback first, and two conditions presented constructive feedback first. We first examined if there were mean differences in our outcome variables in these three main conditions using a series of independent samples t-tests.

We identified no differences in our sandwich, positive first, and constructive first conditions (see Table 2 for condition means and results of t-tests). In turn, we collapsed each of these conditions and in turn were left with a total of three feedback sequencing conditions: Sandwich, Positive First, and Constructive First. Our fourth condition represented our control condition. See Table 3 for condition means for collapsed and control conditions.

Condition	Sandwich		Positive First		Constructive First	
	1	2	1	2	1	2
Positive Emotion						
M	2.21	2.38	2.16	2.27	2.31	2.07
(SD)	(0.58)	(0.64)	(0.59)	(0.68)	(0.61)	(0.58)
t (df)	-1.26 (82)		-0.79 (80)		-1.72 (75)	
p	.21		.43		.08	
Negative Emotion						
M	3.37	3.26	3.37	3.23	3.26	3.39
(SD)	(0.70)	(0.94)	(0.77)	(0.96)	(0.88)	(0.93)
t (df)	0.63 (82)		0.75 (80)		-0.58 (75)	
p	.53		.46		.56	
Cognitive Reappraisal						
M	4.59	5.00	5.06	4.83	4.57	4.85
(SD)	(1.15)	(0.91)	(1.00)	(0.82)	(1.22)	(1.11)
t (df)	-1.83 (82)		1.10 (80)		-1.08 (76)	
p	.07		.28		.28	
Expressive Suppression						
M	3.99	3.89	4.02	4.10	4.13	3.84
(SD)	(1.39)	(1.37)	(1.27)	(1.33)	(1.34)	(1.25)
t (df)	0.31 (82)		-0.27 (80)		1.00 (76)	
p	.76		.79		.32	
DERS						
M	3.69	2.46	2.58	2.51	2.78	2.69
(SD)	(0.60)	(0.55)	(0.54)	(0.58)	(0.57)	(0.69)
t (df)	1.87 (82)		0.53 (80)		0.12 (76)	
p	.07		.60		.90	

Table 2: Condition Means for Six Sequencing Condition and T-Test Results

Condition	Positive Emotion	Negative Emotion	Cognitive Reappraisal	Expressive Suppression	DERS
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Sandwich (PCP)	2.89 (0.61)	3.61 (0.81)	4.78 (1.07)	3.95 (1.37)	2.59 (0.59)
Constructive First (CPP)	2.21 (0.63)	3.30 (0.87)	4.95 (0.92)	4.06 (1.29)	2.55 (0.56)
Positive First (PPC)	2.18 (0.60)	3.33 (0.90)	4.72 (1.17)	3.97 (1.29)	2.70 (0.63)
Control (No Feedback)	2.41 (0.66)	3.30 (0.97)	5.09 (0.89)	3.93 (1.07)	2.69 (0.62)

Table 3: Condition Means for Collapsed Conditions and Control Condition

H1: Testing the Effects of Feedback Sequencing on Negative Emotion

We first examined the condition means for the three collapsed experimental groups. H1 predicted that the sandwich feedback condition would produce lower levels of negative emotion compared to other feedback sequencing conditions while controlling for emotion regulation variables (i.e., cognitive reappraisal tendencies, expressive suppression tendencies, difficulties in emotion regulation).

To explore the effects of sequencing on motivation, then, we ran a linear regression in which the effects of feedback sequencing on motivation was examined. First, we examined correlations among emotion and emotion regulation variables (see Table 4). Next, we dummy coded the collapsed feedback sequencing conditions into three groups: (1) Sandwich; (2) Positive first; and (3) Constructive first where the sandwich condition was the reference category. In the model, we controlled for possible confounding variables including cognitive reappraisal tendencies, expressive suppression tendencies, and difficulties in emotion regulation.

	Positive Emotion	Negative Emotion	Cognitive Reappraisal	Expressive Suppression	DERS
Positive Emotion	1.00	-.04	.22*	.13*	.002
Negative Emotion	-.04	1.00	.07	-.05	.31*
Cognitive Reappraisal	.22*	.07	1.00	-.04	-.25*
Expressive Suppression	.13*	-.05	-.04	1.00	.22*
DERS	.002	.31*	-.25*	.22*	1.00

Note. * denotes significance at p > .05.

Table 4: Correlations Among Emotion and Emotion Regulation Variables

The overall regression model was statistically significant (Adj. R^2 = .13, $F(6, 274) = 7.06$, $p <$ .001). However, in our model, we did not find an effect for the feedback sandwich (Constant: B = 2.59; SE = .38; Constructive First: B = -0.01, β = -0.01, p = .94); Positive First: B = -0.05, β = -0.03, p = .69, Control: B = .08, β = .04, p = .51.

We did, however, identify an effect for emotion regulation tendencies (Cognitive reappraisal: B = .14, β = .23, $p < 0.01$; Expressive suppression: B = -.09, β = -.13, p = .03). Difficulties in emotion regulation did not have an effect on negative emotion B = .55, β = .38, $p <$ .001). Therefore, H1 was not supported; the feedback sandwich did not lead to lower levels of negative emotion compared to other feedback conditions while controlling for emotion regulation tendencies and difficulty in emotion regulation.

H2: Testing the Effects of Feedback Sequencing on Positive Emotion

We first examined the condition means for the three collapsed experimental groups. H2 predicted that the sandwich feedback condition would produce higher levels of positive emotion compared to other feedback sequencing conditions while controlling for emotion regulation variables (i.e., cognitive reappraisal tendencies, expressive suppression tendencies, difficulties in emotion regulation).

To explore the effects of sequencing on motivation, then, we ran a linear regression in which the effects of feedback sequencing on motivation was examined. First, we dummy coded the collapsed feedback sequencing conditions into three groups: (1) Sandwich; (2) Positive first; and (3) Constructive first where the sandwich condition was the reference category. In the model, we controlled for possible confounding variables including cognitive reappraisal tendencies, expressive suppression tendencies, and difficulties in emotion regulation.

The overall regression model was statistically significant (Adj. R^2 = .08, $F(6, 274) = 4.03$, p = .001. However, in our model, we did not find an effect for the feedback sandwich (Constant: B = 1.32, SE = .28; Constructive First: B = -.10, β = -.08, p = 0.27; Positive First: B = -.10, β = -.07, p = .30; Control: B = .08, β = .04, p = .51).

We did, however, identify an effect for emotion regulation tendencies (Cognitive Reappraisal: $B = .14$, $\beta = .23$, $p < 0.01$; Expressive Suppression $B = .07$, $\beta = .14$, $p = .02$). Difficulties in emotion regulation did not demonstrate an effect on positive emotion ($B = .03$, $\beta = .03$, $p = .70$).

Therefore, H2 was not supported; the feedback sandwich did not lead to higher levels of positive emotion compared to other feedback conditions while controlling for emotion regulation tendencies and difficulty in emotion regulation.

Discussion

Although it seems plausible that feedback sequencing would impact emotional outcomes, the present study finds little evidence for this possibility. So, while in theory the method seems likely to lead to positive outcomes, in practice, insofar as emotional experiences go, the technique falls short. Discrepancies between results of the current study and articles in the popular press regarding the effectiveness of the feedback sandwich point to the importance of empirical research used to test arguments appearing the popular press.

The scant number of studies conducted on feedback sequencing, and more specifically the sandwich method, suggest that while the feedback sandwich may influence cognitive-level variables (i.e., student perceptions of the usefulness and effectiveness of the sandwich method), the effects of the method end there. The limited number studies conducted on instructor feedback sequencing and receiver perceptions suggest that the feedback sandwich method increases receiver judgements related to the usefulness and effectiveness of feedback than other sequences of feedback (e.g., Davies & Jacobs, 1985). However, subsequent studies have failed to find that the method leads to improved performance (e.g., Prochazaka et al., 2020) and emotional outcomes (Dolan et al., 2021). The current study further corroborates that the sandwich method may not be a major factor leading to positive educational outcomes, namely emotion regulation.

Taken together, results from the current study in combination with the larger body of research suggest that perhaps researchers should focus their attention on variations of feedback other than sequencing in their pursuits of understanding how instructors may effectively regulate their students' emotions through feedback on class assessments.

However, it might not be worthwhile to discount feedback sequencing all together. It may be the case that our experimental inductions were not strong enough to detect effects. For instance, it may be the case the sandwich method may be a useful tool for consistent feedback across a period of time. The current study looked only at a single instance of delivering feedback. Ideally, a longitudinal study would be able to examine the effects of repeated feedback.

Participants were also provided with little context about the class (e.g., the title of the class), which may also make a difference. Other factors that may have contributed to our inability to detect effects may include the channel of feedback (written verbal); it may be the case that spoken verbal feedback would produce a different pattern of results. Another factor to consider would be whether that verbal feedback is given publicly or privately to students.

Conclusions

Although the current study does not provide evidence that the feedback sandwich method has leads to higher levels of positive emotion and lower levels of negative emotion within student recipients, there is still much work left to do in this area. It may be the case that feedback sequencing affects cognitive, motivational, emotional, and behavioral variables through a less direct path than was originally assumed. Future work should consider these possibilities.

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Master of Engineering Management: A Reference Curriculum Development

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Due to the *multidisciplinary nature* of Engineering Management (EM), understanding core requirements for the curriculum design is critical for the growth of this discipline. However, Australia still lacks agreement among universities on Master of Engineering Management (MEM) program curricula with no professional quality standards. *Aim:* This study aims to provide an insight into MEM curriculum development in Australia through benchmarking with the standards from a global professional society - the American Society of Engineering Management (ASEM). *Methodology:* Firstly, from preliminary research of MEM programs, a database of course structure is developed. Then, word cloud and text analytic techniques are used to provide an insight into the current curricula. Benchmarking is made by comparing these current practices with ASEM curriculum requirements and EM domains. Finally, an in-depth case analysis serves as a self-assessment example.*Findings:* The results show the maturity in Australian MEM program quality. Curricula meet the rigorous standards of ASEM and align with the EMBoK guide. However, this benchmarking exercise also helps to diagnose the problems, such as EM domain balance, integrating emerging trends into curricula, and the scatter in the course structure. The case study provides an in-depth analysis of using this reference of curriculum development to seek for excellence in program quality.*Originality:* This study is the first one to suggest a benchmarking method for MEM programs in Australia with global professional standards. It raises the question of a professional body for this discipline, and also provides a seed study for similar benchmarking exercises for other programs.

Keywords: Engineering Management, Australia, Master Program, Curriculum, ASEM, Benchmark, Certification

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1. Introduction

The EM concept is affirmed to have a long history back with around a thousand years ago (Dow, 2010). This term is well-known as the transition of an engineer from a technical to management responsibility (Palmer, 2003). This promotion happens some time in a typical engineering career path regardless of whether and when (Palmer, 2003; Srour, Abdul-Malak, Itani, Bakshan, & Sidani, 2013); and is usually after the first 5 years in the technical field (Lannes, 2001). EM degree, on the other hand, is quite relatively new with the history of the US courses in business and management aspects of engineering from the 1910s (Kotnour & Farr, 2005). Until the mid-1940s, EM officially became a formal degree (Lannes, 2001).

Since EM is expected to be used more extensively as an engineer's career progress when the transition to the management phases happens (Edgar, 2002; D. J. Pons, 2015), more and more engineers are seeking postgraduate studies in management (Palmer, 2003). Practitioners also agree that a postgraduate degree in EM is one of the factors on engineering career progression (Srour et al., 2013). In addition, many organizations start to require certificates for engineering managers (Remer & Ross, 2014). Realizing this need, there has been a rapid growth of graduate EM related-programs (Kauffmann, Farr, Schott, & Wyrick, 2015b) and also EM certifications (Remer & Ross, 2014).

While academic discipline EM is well-established and recognized by Accreditation Board for Engineering and Technology (ABET) (Sarchet & Baker, 1995), MEM programs are somewhat inconsistent and the content is lacking the agreement among educational institutions (J. D. Westbrook, 2005). Instead, these programs are relatively an ambiguous discipline and selected courses are specifically developed to meet the demand (Bozkurt, 2014; Sarchet & Baker, 1995). While ABET is the lead society for accreditation of EM undergraduate programs, ASEM is responsible for the recognition of quality programs at graduate levels (Peterson, 2005).

Specifically, in Australia, EM is found as far back as 1968 with the definition of the coupling of management with technical work (Lloyd, 1968). And the demand is increasing the with the prediction of 12.8% growth over the next five years for engineering managers (Diemar, 2021). Regarding education, the research has shown that the dominant choice for continuing professional development in engineering is pursuing management postgraduate study in Australia (Kean, 1997). And the modern workplace is also contributing to the choice of professional master's programs of engineering graduates (Goh, Jokic, & Hartle, 2010).

Management practices are now the focus of continuing professional education to fill the gap of management competency for engineers and engineering managers in Australia (King, 2008). However, at the graduate level, the standard for curriculum quality is somewhat in its infant (Goh et al., 2010), despite the fact that scholars have stated that understanding the curriculum design with core requirements is critical for the growth of this discipline (Bozkurt, 2014; Kotnour & Farr, 2005). Engineers Australia (EA), the engineering profession body and the *accreditation* authority for tertiary institutions in Australia, does not accredit "stand-alone" master programs (King, 2008). And no professional body or association is guiding or managing the quality of MEM programs in Australia.

Realizing this shortcoming, this study aims at exploring the current practices of MEM program curricula in Australia through using benchmarking. To conduct the analysis, text analytics is used to describe the current practices and the performance of curricular will be

measured based on ASEM curriculum requirements. Considering ASEM standards as guidance for achieving excellence in quality, an in-depth exploration of a specific MEM curriculum is illustrated as a self-assessment which will provide the institution with an improvement strategy to seek for a higher maturity as well as recognition worldwide. ASEM certified MEM programs will add value in advertising in the company of programs for Australian institutions.

This paper is then organized into 5 sections. The next section provides the background of ASEM certified programs as well as the current practices of MEM programs in Australia. It is then followed by data collection and findings. The fourth section discusses these results and gives recommendations to improve the situation. The paper continues with an in-depth case study and ends with conclusions.

2. Background

2.1. ASEM Certified Programs

EM discipline is mentioned to be a big tent (Kauffmann, Farr, Schott, & Wyrick, 2015a) and there are significant differences found among EM programs (J. Westbrook, 2006). Regarding MEM programs, there is still a lack of agreement among universities on program content (J. D. Westbrook, 2005). As such, there is the need for sharing the common ground for this degree (Kauffmann et al., 2015a).

MEM programs have received high demand and interest from employers and engineering professionals from all disciplines (Daughton, 2017; Kauffmann et al., 2015b; Sarchet & Baker, 1995; J. D. Westbrook, 2005). While ABET accreditation is well-known for undergraduate programs (Peterson, 2005), master programs tend to seek recognition from ASEM (Daughton, 2017; Peterson, 2005). ASEM provides a standard framework to define the characteristics of a successful EM master program, which meets a reasonable set of minimums (Peterson, 2005; J. Westbrook, 2006). According to the EM Master's Program Certification Academic Standards by ASEM, these criteria include requirements of Faculty, Curriculum, Students-Admission, and Administrative Support (Headquarters, 2021). To accomplish the goal of building the commonality for MEM programs, ASEM has published the EMBoK guide which serves as a foundational reference for the discipline and curriculum development (Dow, 2010; Radhakrishnan & Pettit, 2019). There are 10 EM domains that are built from a global perspective (Shah, 2019). They are illustrated in Figure 1.

The scope of this study is focusing on curriculum perspective with structure and management, which include 10 criteria as follows:

- #1. A balance between qualitative and quantitative courses. Curriculum should reflect the domains of the EMBOK.
- #2. At least one third of the curriculum will be management-related including management of people, projects, and strategy courses.
- #3. A third of the courses in the Engineering Management Program have a coordinator from the EM program who has oversight for the course content.
- #4. Course material must be directly related to technology driven organizations.
- #5. The curriculum must require each student to demonstrate a command of written and oral communication skills in English or in the language of instruction in countries where English is not the language of instruction.
- #6. Courses must relate to knowledge workers in a global environment.

- #7. Each student is required to perform a capstone project or thesis using analysis and integration of Engineering Management concepts. For programs that do not have a capstone project or a thesis option, project work from individual courses in the program should demonstrate application of theory in real world settings.
- #8. A minimum of one course in statistics or Quality Engineering or a related area.
- #9. A minimum of one course in engineering economy or Financial Management or a related area.
- #10. Two courses in quantitative analysis are required.

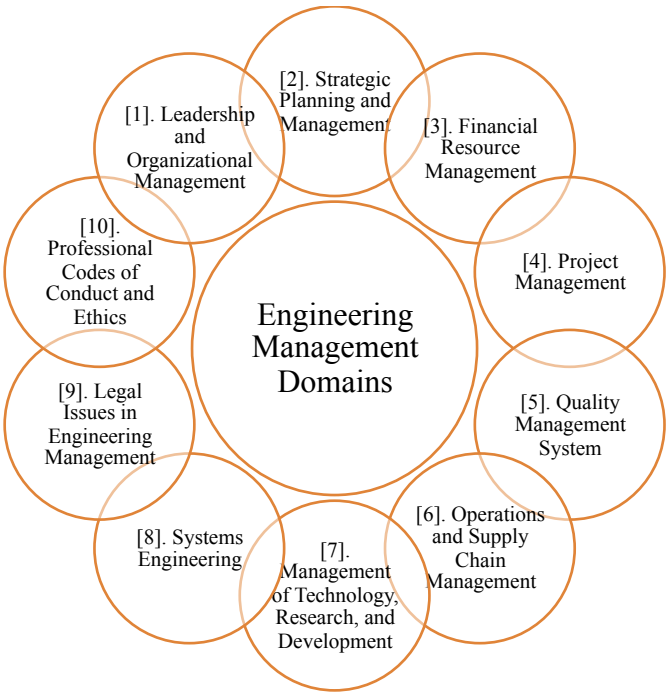

Figure 1: EM body of Knowledge (Shah, 2019)

2.2. Australian MEM Programs

Australia is mentioned to be the second country distributing engineering and technology management programs after the US in the early days (Kocaoglu, 1994). Nationwide, from the 1980s, the role of management has been confirmed to play a vital role in practice for professional engineers (Young, 1986) and to be a requirement for all engineering activities (Young, 1987).

Australia is home to 43 universities. Preliminary research of universities offering graduate-level EM programs is conducted through multiple sources. The results show 16 institutions with 17 MEM programs. This data is collected through the main source CRICOS (**Commonwealth Register of Institutions and Courses for Overseas Students) and** additional online research. Table 1 illustrates MEM programs in Australia.

Table 1: EM Master Programs in Australia

	Program name	**Institution**	**Duration**	**Note**
1	Master of Engineering (Management)	Royal Melbourne Institute of Technology	2-year	
2	Master of Engineering (Engineering	University of South Australia	2-year	

	Management)			
3	Master of Engineering Management	La Trobe University	2-year	
4		The University of Melbourne	1-year	
5		Curtin University	1-year	
6		Torrens University Australia Limited	2-year	
7		Flinders University	2-year	
8		Macquarie University	2-year	New program from 2020
9	Master of Engineering Management	University of Wollongong	1-year	
10	Master of Engineering (Management)		2-year	
11	Master of Management f or Engineers	Central Queensland University	2-year	
12	Master of Engineering Management	University of Technology Sydney	1-year	Double degree with MBA, MEng
13		Southern Cross University	1-year	Double degree with MBA
14		Queensland University of Technology	1-year	Double degree with MEng
15	Master of Engineering Science (Management)	The University of Queensland	2-year	Combining selected engineering field with business
16	Master of Engineering (Professional)	Deakin University	2-year	EM specialization
17	Master of Engineering Management	The University of Newcastle	1-year	Teach-out

It can be easily seen that MEM education is scattered in many different programs. The dominant is the "stand-alone" MEM program, followed by Master of Engineering with EM specialization. Institutions also provide a "dual-program" between MEM with Master of Engineering or MBA. And there has been no standard for curriculum development and quality management of these programs.

3. Data Collection and Results

Data collection process is involved 2 steps.

Step 1: Firstly, from the list of 16 MEM programs, course names and descriptions are collected through the university website and handbook as data for each program. This step is to form the curriculum database with two groups: core/foundation, and elective unit.

For the core unit group, there are 158 units, including Research methods and Thesis/Internship/WIL/Project Capstone. And 206 units are found as electives.

Step 2: Based on the database of step 1, the main analysis conducted for the curriculum structure is developing a conceptual map based on text analytics and benchmarking with ASEM standards for curriculum requirements.

- For the core unit group, for each curriculum, course names and course descriptions are mapped with 10 EM domains. The next figures and tables show the results.

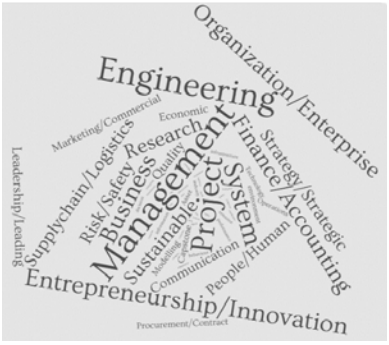

Figure 2: Word Cloud of Core Unit Group

Table 2: Core Units of MEM Syllabi Mapping with ASEM Embok Domains

Domains	**Percentage of programs**
[1]. Leadership & Organizational Management	81.25%
[4]. Project Management	81.25%
[2]. Strategic Planning and Management	31.25%
Sustainable theme (exclusive)	50.00%
[7]. Management of Technology, Research, and Development	75.00%
[6]. Operations & Supply Chain Management	62.50%
[3]. Financial Resource Management	62.50%
[5]. Quality Management System	25.00%
Risk theme (exclusive)	37.50%
[8]. Systems Engineering	43.75%
[9]. Legal Issues in Engineering Management	6.25%
[10]. Professional Codes of Conduct and Ethics	0.00%

- Electives, on the other hand, are scattered in many different programs. The curriculum design in elective units is diverse enough to support different demands in society. These programs may provide elective units from either "only-engineering theme" (such as La Trobe University and University of Technology Sydney), "only-management theme" (such as Macquarie University), or from both themes (such as RMIT). Table 3 illustrates the percentage of elective course themes. Furthermore, to have an insight on this, a text analysis (software Gephi) is used to illustrate a concept map of themes for these units.

Table 3: Elective Course Theme

Theme	**Percentage**
Only- engineering/ technology units	12.5%
Only - management/business units	43.75%
Combined	43.75%

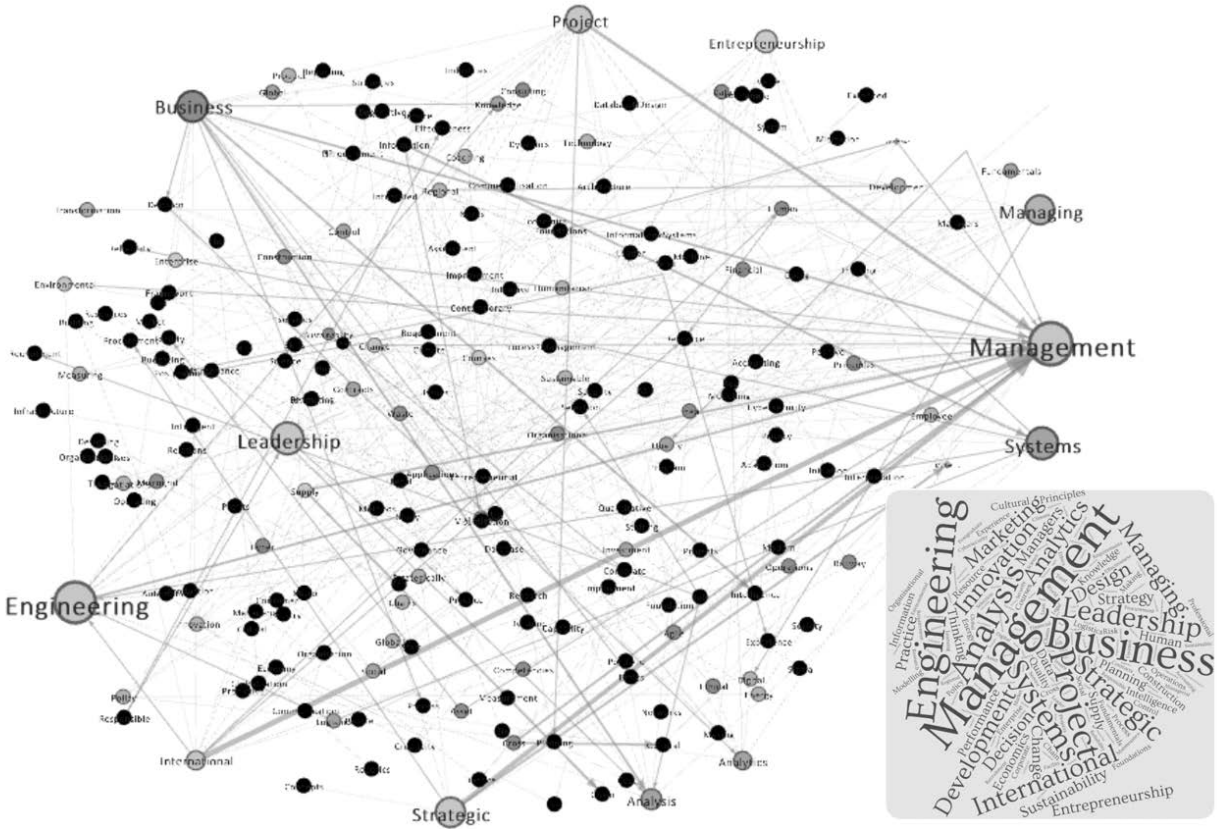

Figure 3: Word Cloud and Text Analytics of Elective Unit Group

4. Discussion and Recommendation

ASEM has developed broadly-based quality standards, which can be used as a benchmark to evaluate an existing Master's program. This program certification will distinguish certified programs as being in the top tier, worldwide. While there is a continuing interest of universities in offering EM master programs in Australia, a certification of EM graduate programs will add value in advertising in the company of programs.

The following section will discuss how Australian programs meet these criteria of the curriculum.

Criteria 1 and 10: For both groups, the word clouds shown in Figures 2 and 3 present the high frequency and the balance of terms "engineering" and "management" in unit names. EM can be the mutual efforts between colleges with the combination of Engineering and Management programs (Kocaoglu, 1994), Table 3 can also be the evidence for the involvement of both Schools in delivering these programs. This result shows the balance in quantitative and qualitative courses, which are mostly from subjects from School of Engineering and Management respectively.

Criteria 1,2,8 and 9: Text analytics have demonstrated noticeable words with high frequency, such as "Project", "System", "Entrepreneurship/Innovation", "Finance", or "Organization / Enterprise" at core unit group. It can be easily seen that these themes are aligning with EMBoK domains (criteria 1). Unlike core units, the figure of text analytics and word cloud shows that elective courses deal with variations in direction and topics among educational

institutions. However, noticeable terms such as project, strategy, entrepreneurship, or leadership are within 10 EM domains by ASEM (criteria 1).

A depth- analysis for these themes in core courses at Australian programs is shown in Table 2 (criteria 1,2,8 and 9). Among 10 domains, Leadership & Organizational Management, Project Management, and Strategic Planning and Management receive the greatest attention from educators. 81.25% of the programs provide these courses in their programs. This is consistent with the requirement of a management-related curriculum including management of people, projects, and strategy courses (criteria 2).

On the other hand, in 2016, a survey about the importance of EM competencies was conducted with practitioners in the industry in New Zealand, ethics is with at least 40% support (D. Pons, 2016). In a competitive environment, ethical guidance is incredibly important for the decision of engineering managers (Cook, 2008); as such, law and professional ethics would be within the primary discipline of EM (Shah, 2019). However, it is noticeable that there is less attention for the domain of Legal Issues in Engineering Management and there is no Professional Codes of Conduct and Ethics found in the current design. Scholars mentioned that the curriculum must allocate time to these topics (D. Pons, 2016). To fill this gap, there are two courses of Ethical Issues in Management, or Business Ethics found in the elective group. This shortcoming has raised the awareness for curriculum designers with integrating ethics and laws into the MEM curricula.

Criteria 4 and 6: Program content needs to encompass all sub-specialties to meet the contemporary demands of technology-based enterprises (Sarchet & Baker, 1995). A striking point is the "sustainability" theme. Half of the programs contain sustainability-related subjects in their core curricula. While ASEM and ABET suggest sustainability as a part of EM graduate educational program (Radhakrishnan & Pettit, 2019), c*onsistent with the global trend,* Australian MEM programs also acknowledge the role of this aspect in their programs.

Elective courses have been found to offer emerging training to future engineering managers; however, it is still in its infant with scattering courses offered at one or two programs. For example, with the 4th Industrial Revolution, engineering managers are mentioned to be well-trained to ensure a smooth transition into the new role for the changing workplace (Markl & Lackner, 2019). To meet this demand, Australian curricula have expanded the boundaries with courses of this emerging strategy or technology such as Innovation and Industry 4.0. However, only one program is found offering this course at the moment. Furthermore, the big data era also brings challenges to EM. Engineering managers need to leverage intelligent techniques to solve complex problems (Kahraman & Çevik Onar, 2015). As such, Business intelligence or Intelligent Production Systems course have been introduced as electives (3 programs). Courses of Data Modelling and Database Design, Big Data and Decision Analysis, Data Management and Analytics, or Modern Data Science have also been brought to the curriculum (3 programs).

Criteria 7: The analysis found that all programs meet this criterion with most of the programs using the course name of project or capstone, only program using thesis, and a few under different names such as Professional Practice.

Considering EMBoK and standards of ASEM as guidance for curriculum development and validation, the benchmarking process has shown that Australian MEM program curricula have been developed meeting worldwide standards, covering competency areas. This will

provide students with knowledge and skills that are applicable to the EM discipline. The programs are designed to focus on 10 domains of EM to prepare engineers for managerial roles. In addition, with the rise in technological innovation, programs have been designed with emerging trends, such as Sustainability, Big Data, or Industry 4.0. However, these rigorous standards of ASEM also help to notice the shortcomings in curriculum development. First of all, promoting domains of ethics and law is in need. In addition, course design is still scattering among different programs. This raises the awareness for educational managers to set a commonality to manage program quality in Australia.

5. A Case-study

ASEM certification also especially serves the function of validating new Master's programs. As such, this study is taking a new MEM program at Macquarie University (MQ University) as an example to examine. In this study, the focus is on the curriculum requirements.

This program was established in 2019 with the first enrolment in Feb 2020. It is the mutual effort between School of Engineering and The *Macquarie* Graduate *School of Management* (MGSM) – one of Australia's leading business schools for 50 years, and the global top 100 MGSM MBA. The curriculum is described in Table 4.

Table 4: Course Structure at MEM Program at Macquarie University

Foundation zone and Core zone		**Elective zone**
ENGG4104 Engineering Contracts and Procurement	ENGG8000 Professional Practice	ACCG8042 Measuring and Managing Performance
ACCG6003 Managing Finance	ENGG8102 Engineering Management Capstone	ACCG8048 Business and Professional Ethics
MGMT6008 Managing People	ENGG8104 Engineering Project Implementation	BUSA8037 Big Data and Decision Analysis
COMP8780 Enterprise Management	ENGG8106 Engineering Entrepreneurship	MGMT8005 Managing Technology
ENGG8103 Engineering Management and Communication		MGMT8009 Managing Globally
ENGG8105 Quality and Reliability		MGMT8011 Learning to be a Leader
ENGG8401 Safety and Risk Engineering		MGMT8012 Managing Strategically
MGMT8028 Managing Supply Chains		MKTG8031 Design Thinking for Innovation

Criteria 1: This program requires students to complete 16 units in total with 12 core and foundation units, and 4 elective units. Since this program is a mutual effort between two schools, School of Engineering and MGSM, the balance contribution in program courses is illustrated in Table 4 with 8 engineering courses (starting with ENGG) and 8 management courses.

- Quantitative courses: ENGG4104, ACCG6003, ENGG8103, ENGG8105, ENGG8401, MGMT8028, ENGG8104, ACCG8042, ENGG8102, ENGG8000
- Qualitative courses: MGMT6008, COMP8780, ACCG8048, BUSA8037, MGMT8005, MGMT8009, MGMT8012, MKTG8031

Regarding the domains of the EMBOK, the following table illustrates how the curriculum reflects these EM domains.

Table 5: MEM Syllabus and EM Domains

EM Domain	Core or foundation unit	Elective unit
[1]	MGMT6008, COMP8780	MGMT8011
[4]	ENGG8103, ENGG8104, ENGG8102, ENGG8000	
[2]		MGMT8012, MGMT8009
[7]	ENGG8106,	MGMT8005, MKTG8031
[5]	ENGG4104, MGMT8028, ENGG8401	ACCG8042
[3]	ACCG6003	
[5]	ENGG8105	
[8]	ENGG8000, ENGG8103	
[9]		
[10]	ACCG8048	

Criteria 2: Half of the curriculum is from School of Business with management courses ("management" term in unit names), such as:

- Management of people and leadership: MGMT6008, MGMT8011, COMP8780
- Management of strategy: MGMT8009, MGMT8012
- Management of supply chain: MGMT8028
- Management of finance: ACCG6003

And courses from School of Engineering are designed to be management-related.

- Management of projects: ENGG8102, ENGG8104
- Management of technology: ENGG8106
- Management of quality: ENGG8105

Criteria 3: Program directors are from both School of Engineering and MGSM, who have oversight for courses and syllabus in general. Core units are designated "Engineering Management" courses, reflecting the domains in the EMBOK Guide. Regarding the course content, 7 courses from School of Engineering have 3 coordinators from the EM program.

Criteria 4: Course materials are designed for technology-driven organizations, such as Engineering Project Implementation ENGG8104, Engineering Entrepreneurship ENGG8106 or ENGG4104 Engineering Contracts and Procurement. Courses from School of Business are also related to technology driven organization, for example, BUSA8037 Big Data and Decision Analysis, or MGMT8005 Managing Technology.

Courses are designed with up to date materials, for example, ENGG8105 or ENGG8102 with the 2019 textbook version. Global concepts are effectively taught through applying international standards, such as PMBoK for ENGG8104, or EMBoK for ENGG8102.

Criteria 5: The program is taught in English. Students are required to provide evidence of English language proficiency as an entry requirement.

Criteria 6: The program is currently established (2019) and this course is designed to enable engineers to take the next step towards management positions. The program brings courses on the current economy and global competition to students, such as Managing globally MGMT8009, Big Data BUSA8037, or Innovation MKTG8031. Course content also contains emerging trends in a global environment, such as topics of covid-19 pandemic (ENGG8102), sustainability (ENGG8000, MGMT8012), or Industry 4.0 (ENGG8106) …

Criteria 7: The program has ENGG8102 (Engineering Management Capstone) as a core unit.

Criteria 8: One core course in Quality Engineering ENGG8105, and two core courses with statistics-related content ENGG8401 and ENGG8104.

Criteria 9: One core course in Finance ACCG6003.

Criteria 10: All core courses from School of Engineering are in quantitative analysis. Other courses from School of Business also have quantitative analysis in their content ACCG6003 and MGMT8028.

A short summary of the self-assessment based on ASEM standards of the curriculum has provided evidence of how MEM program at MQ university meets the worldwide criteria. The self-assessment has also provided an insight into how the program perceives the performance and identifies areas for improvements. Since this is the first-time program run, this benchmarking has helped the program directors to raise the awareness at these points:

- Criteria 1: The program has reflected almost EM domains as is mentioned in Table 5, however, less attention is given to Legal Issues in Engineering Management.
- Criteria 3: Due to the nature of engineering, managing engineering is different from general management. As such, this requires the involvement of course coordinators from EM programs to oversight for the course content. From the MGMS side, the program director at MGSM is in charge of course content; however, for specific courses, there is no course coordinator from the MEM program. This may raise the awareness of program directors for future improvement plans.
- Criteria 4 and 6: The requirements of up to date and current curriculum to meet the global demand have also required the program directors to have a strategy in reviewing and updating the program to maintain excellence in program quality.

6. Conclusion

The main motivation of this research is to gain an understanding of MEM program curricula in Australia, and how these programs manage the quality to achieve international recognition. This study is the first one suggesting to use global professional standards of ASEM as a benchmark for MEM programs in Australia. This also serves as guidance of self-assessment and to reflect improvements to seek for maturity in the program quality. Given the apparent market demand for EM education, a certified program is suggested for the recognition to stakeholders. This study also provides a seed study for similar benchmarking exercises for other programs. Reviewing the current practices of MEM programs also leads to a question a professional body for this discipline in Australia may open for both academic and practitioner perspectives.

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The Indian Odd: Women's Rising Education and Declining Workforce Participation

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The disproportionate representation of women in labor as compared to their education is an Indian odd, which will be examined in this study. Women are attaining higher education degrees at similar rates as men but hold a much lower track of considerable labor participation. Women constitute only 21% of the workforce compared to 49% of total enrolment in higher education in India (AISHE, 2020). This apparent paradox is the result of a variety of factors where gender roles in society and discrimination at job work play its role interchangeably. This study aims to address the gap in the literature by collectively exploring the personal and economic determinants to explain the negative correlation between women's education and their labor participation in India. The theories of human capital suggest that with more education, women acquire greater skills, and their earnings increase, resulting in higher labor force participation (Chattarjee, 2018). In India, counter-theoretical results from data deserve greater research attention than it has been given. This study will provide an acute test of personal and economic determinants affecting women's labor force participation. It will establish new directions for future research to explain the negative correlation between women's labor participation and higher education in India.

Keywords: Female Labor Force Participation, Human Capital, India, Education, Graduate Women

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Introduction

India's sustained high economic growth has brought significant improvement to the lives of Indian women since the early 1990s. However, female labor force participation has remained stagnant at about less than 30%, with the latest labor surveys even suggesting greatest fall in female labor force participation (FLFP) rates since independence. In contemporary India, women have greater access to higher education and degree-granting institutions than they have ever had in history. Nevertheless, women constitute only 21% of the workforce in comparison to 49% of total enrolment in higher education (AISHE, 2020). In India, female education and its labor force participation outcomes are complex. This paper will explore an Indian odd, where the modern sector has encountered a fall in FLFP despite women's rising education. It will review the documentary resources to discuss the determinants underlying the exceptional Indian experience. In this section, I will discuss the background of the Indian Odd. The following sections deal with the determinants that have been identified from the existing literature in greater detail.

In 1994, India ranked 68th out of 83 countries in terms of the rate of female labor force participation. As of 2012, it ranked 84th out of 87 countries. India has recorded the lowest rate of female labor participation since independence at 20.2% in 2018 (Kapsos, et al., 2014). A paradoxical Indian experience of fall in FLFP rates despite the rising female education has raised brows across the globe. India's peculiar development trajectory requires to be highlighted, and its deviation from the standard experience demands to be expounded.

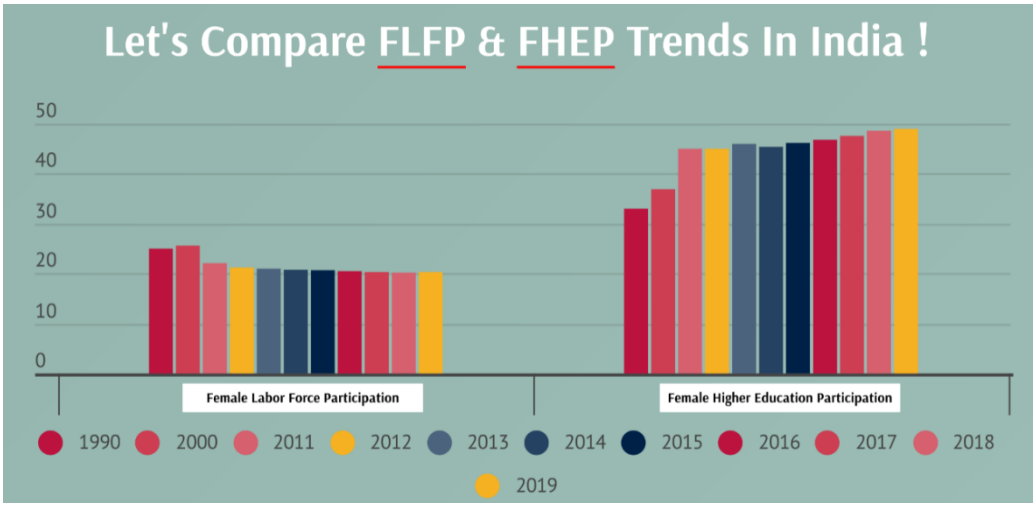

Fig1-Comparison between FLFP and women in higher education in India.
Female Higher Education Participation in India Data Retrieved from AISHE Report (2020) Female Labour force Participation in India data from ILOSTAT database. Data retrieved on June 15, 2021.

Figure 1 illustrates a comparison between female labor force participation and female higher education since 1990- 2019 in India. The FLFP was at 25% in 1990, which sharply declined to 20.5% in 2019 despite economic growth and women's rising education. On the other hand, the participation of women in higher education increased from 33% in 1990 to 49% in 2019, illustrating an increase of 16%. What is more shocking is that while in 2017, India was one of the fastest-growing economies by consistently maintaining growth rates above 7% , the same year India's female labor force participation fell to the lowest levels at 20.3% since Independence. FLFP is depicted in this data as a complicated topic involving social norms,

educational attainment, caring obligations, economic prospects, and so forth. The next sections deals with economical and socio-cultural determinants associated with low levels of FLFP in greater detail.

Economic Empowerment: What is holding women back?

Women's economic empowerment is central to gender equality and women's rights. Considerable research has shown that investment in women's economic capabilities is important for rapid productivity and inclusive economic development (UN Women, 2018). In most countries, women's rising educational attainment contributes to women's economic empowerment and the inclusive economic growth of the country. However, a U-shaped relationship is observed between the FLFP and female education in India (Chatterjee, Desai, and Vanneman, 2018). Women who are illiterate are more likely to be employed than women who are educated (Sathar and Desai, 2000; Das and Desai, 2003). A negative correlation exists between women's education and their labor force participation in the country. These findings were supported in the analysis by Ravendran (2016) based on unit-level datasets of employment and unemployment surveys conducted in India. The illiterate women and those below the secondary level of education were found to be more likely to join the workforce. This implies that women with moderate and higher levels of education do not have equal access to formal jobs as male degree holders.

Simply, there is a lack of appropriate jobs matching the skills and ambitions of educated women. Amidst India's economic growth, "job deficit" is to be blamed for a decline in FLFP. Worryingly, the white-collar jobs have declined from 19 percent in 1987 to a mere 17 percent in 2009, whereas the graduates in the working-age population have increased from 11 percent to 21 percent (Desai, 2019). Furthermore, the author stated that there is an absence of suitable jobs rather than the withdrawal of educated women from the labor force. Women tend to compete in a small pool of formal sector jobs. Therefore, instead of accepting poorly paid jobs, they choose to remain out of the workforce. The oversupply of educated female workers relative to their employment growth has resulted in crowding out of female labor participation.

The improvement in women's education has occurred at a time when the economic sectors where women are hired predominantly have not shown much growth (Ghai, 2018). The occupational and sectoral segregation by gender has confined women to search for work in particular sectors, which prevails in line with the social norms. However, the reason why economic growth has not contributed towards generating jobs in these sectors remains to be an unanswered question.

One place to look for answers that have not been appreciated sufficiently is the gender wage gap. It is globally acknowledged women are paid less than men. The gender wage gap is estimated to be 23 percent (UN Women, 2021). This highlights ongoing problems of gender gaps in job work despite women's increasing labor presence around the globe. The experiences of Indian women are different from women elsewhere because, in addition to economic and socio-cultural factors, demographic factors also play a crucial role. In India, the wage gap is higher in rural areas than in urban areas. For graduates and above, it is as high as 31.3 percent in rural areas and 24.3 percent in urban areas (Ghai,2018). The percentage of women out of the labor force in urban areas is far more than in rural areas. The U-shaped relationship is the clearest for urban women. Historically in India, the majority of female workers have been involved in agriculture (e.g., Nath 1968). Consequently, women's

labor force participation has always been higher for rural than urban areas. The vocational education training can be a powerful weapon for improving employability and income-earning opportunities for women.

One of the most important ways of enhancing female labor force participation is noted as vocational training. Studies have argued that it has a decisive effect on the participation of women in paid work (Pastore & Bhaduri, 2017). Chaudhary and Verick (2014) have found in their study that the likelihood of women being self-employed is more likely when they have occupation skill training. Bairagya et al. (2019) analyzed the same datasheet and concluded that vocational training helps improve female labor force participation. Educational opportunities can be expanded via technical and vocational skills to help enhance the employability of educated women in the job market. Apart from the demand side, economic factors discussed in this section, various sociocultural supply-side factors such as marriage, motherhood, husband education, caste, household income, etc., play a critical role in an educated women's labor force participation decisions. These determinants will be discussed in greater detail in the next section.

Education, Career, Marriage, and Motherhood- Can she have it all?

The global trends on links between marriage and education for women are out-flowed in the Indian context. The entrenched gender roles and caste constraints restrict women's choices in the marriage market. Educated women are benefited from the marriage market because it allows them to be married into higher-income families. It was revealed in a study conducted by Shavarini (2006) that a strong educational background assisted women in finding a husband in a high-income family.

The high-income household and husbands' education reduces female labor participation (Lei Lei . et al., 2019). In India, a classic income effect is observed where education and male income contribute to the withdrawal of women from the labor force. Women living in households with high incomes are less likely to participate in the labor market. Das and Desai (2003) add to the discussion stating that well-educated women are prevented from labor force participation because higher economic status discourages women from joining the workforce. Contrary, Bhalla, and Kaur (2011) found higher FLFP for women from tribes and scheduled classes because of an absence of education as a symbol of status production.

Similarly, Sorsa et al. (2015) revealed in their study that women who reside in urban areas are highly impacted by cultural factors of caste and religion. Women from lower socio-economic backgrounds lack choices and have to work to survive. In contrast, in high caste families, the highly educated women do not require to work, demonstrating education as a symbol of social status rather than a tool for participating in the labor market and being economically independent (Das & Desai, 2003). It is the social prestige factor that exists among the high-income families that do not permit women to go outside for work. The patriarchal norms discourage women from taking up gainful employment. However, women's socioeconomic independence does not seem to be achieved solely through education.

An educated woman seeks to obtain all objectives in education, career, marriage, and motherhood. As a woman becomes a mother, she is expected to place the demands of her family ahead of her career (Hoffnung, 2004). However, the most challenging part for them is to live with the choices made amidst the everyday guilt, judgment, and chaos of routine life. The contemporary woman desires to have a career and family but considers family more

critical. In a study conducted by Schroeder, Blood, and Maluso (1992), it was found that women chose not to pursue a full-time career but instead take a lengthy break to raise children and not return to work until their youngest child was in school (Hoofnung, 2004). Parenthood appears to be a bonus for fathers and a penalty for women in the labor market.

A working mother faces various difficulties in returning to work with reasons that vary from family support, social support, policies of the organization, etc. In a study conducted by Hewlett (2002), it was observed that many women quit their careers for family responsibilities. The childcare duties and household responsibilities are still handled by women despite working outside the house (Bernie, 2012). Organizations must make workplaces more supportive for women who are at an early stage of motherhood by taking a proactive approach and contributing towards women's professional advancement (Hazarika, 2018). A sound support mechanism is required to maintain a balance between motherhood and professional advancement. Much of the published work on working mothers have been descriptive and does not take into account the potential influence of various societal factors which lead a woman to make difficult professional choices as she becomes a mother. The paradox of women's move to domestic tasks despite their workforce participation cannot be viewed solely as a result of patriarchy, which limits women to domestic activities. For women, the choice is between home and market production rather than labor and leisure.

Conclusion

Conclusively this paper acknowledges that women's decision-making about whether or not to participate is highly complex and shaped by a variety of personal, social, and economic factors that are discussed briefly in this paper. The factors discussed include their education, life events, caste, socio-economic position, male family members' employment, societal restraints, mobility, occupational segregation, appropriate job opportunities, wage rates, and so on. All these have acted as deterrents for women to participate in the labor force irrespective of the economic development of the country.

Every determinant identified in the literature requires to be researched with empirical evidence for solving the Indian puzzle of educated women’s absence in the labor force. Women’s enabling labor participation should be constructed in a policy framework with an awareness of “gender-specific” constraints faced by educated women. Contextually developed gender-responsive policies are required. If the government schemes continue to focus on female education without targeting the cultural and social forces that shape labor force participation, decisions will only increase the burden for women. Therefore, any policy that attempts to close this gap must be comprehensive. Legislation alone will not close the gap, and all the stakeholders must work together to complete it. Krishnakumara and Viswanathan (2021) confirm that women’s empowerment in the household decision-making process is positively associated with labor force participation and economic independence. The failure for educated women’s access to participation in the economy is an under-utilization of the country’s human capital. Large potential benefits can be aimed from policies at reducing occupational segregation, promoting skill development for women in industries with the greatest potential of economic growth, providing childcare subsidies, and discouraging the disadvantages stemming from social norms. Over the last few years, a growing number of scholars have focused on India's low and diminishing FLFP rates. This trend is encouraging, but much more must be done to encourage rigorous innovation to improve women's economic participation.

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Oral History Projects: Practicing a Foreign Language and Exploring Culture While Serving Local Immigrant Communities

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
This paper offers a pedagogical framework for a community engagement project that can be used by instructors of any language. Over the past twelve years, students in Professor Maria Grazia De Angelis' Italian classes have interviewed Italian immigrants living in the San Francisco Bay Area. To develop their language skills, they conduct videotaped interviews in Italian and present the videos to their subjects. The videos are then deposited in an archive, where they become part of a historical record. The interviews are generally conducted in person but were held on Zoom during the COVID pandemic. While this project focuses specifically on Italian immigrants in California, it could be applied with immigrants in any language and region.

Keywords: Community Engagement, Second Language Acquisition, Oral History, Pedagogy, Service Learning, Classroom Planning

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Introduction

This paper describes a college-level community engagement project that can be used by language instructors at any level. The project largely depends upon verbal communication, which can be conducted in the target language, in English, or both. In this article, we will present the perspective of the professor, along with that of the student who co-authored it.

Professor's Observations

In 2007 I was teaching Italian language and culture classes at Saint Mary's College in Moraga, California. I had been teaching for several years, following relatively traditional pedagogical practices. We used a textbook for the courses, but also engaged in daily interactive activities like role playing, working in teams, watching and creating videos, and learning songs.

Overall, the courses were successful, but my view of what could be accomplished in the classroom was challenged that year when a visiting professor conducted an external review. During his visit, he asked whether the Modern Languages Department offered courses that included content other than language and literature, such as service-learning activities. At the time, I believed it would be difficult to integrate service learning into most European language courses, possibly excepting Spanish. The communities associated with those languages (in the case of my classes, Italian immigrants in the United States) were for the most part well established and not in need of what we traditionally think of as "service." When I made this point to the visiting professor, he replied, "Well, that means that you didn't explore this opportunity enough."

This memorable exchange led me to consider how I and the students in my Italian language classes could serve the broad population of Italian immigrants in the Bay Area. As an immigrant myself, I had some connection to this community, although it had never occurred to me to extend it in the context of my teaching. Once the idea took hold, however, I started reaching out to Italian Americans in the Bay Area to solicit their comments. I also contacted Marshall Welch, the director of CILSA (Catholic Institute for Lasallian Social Action), who helps faculty members develop Social Justice courses with a service-learning component. With the encouragement of Marshall and my contacts in the Italian American community, I actively began to pursue a project designed to document and preserve immigrants' stories and culture.

Since that time, this project has grown and developed into three main functions: 1) Recording *oral histories*; 2) creating an historical *archive* to preserve these histories for posterity; 3) creating a *Story Map*, designed to provide data for future historians.

Course Objectives and Components

Oral Histories: Interviews with Immigrants

I have been integrating oral history interviews into my language classes since 2009. As part of their coursework, students conduct interviews with members of the Italian community and create videos to record their memories. Subsequently, in class, they translate the interviews to English and reflect upon the personal histories they have gathered. As a service, they provide

a DVD or YouTube video to the people they have interviewed, helping them preserve their memories for future generations.

More details about this project are described in the following sections.

A Video Archive and a Story Map

At first, the service-learning goal of this project was simply to provide the interviewees and their families with a recorded oral history of their personal memories. Later we expanded the project to create a web-based archive of these interviews, designed to document the Bay Area chapter in the story of the Italian diaspora. Over the past twelve years we have collected more than 100 hours of interviews, mostly in Italian with English subtitles.

Currently we are working to take this project in a new direction. A map of Italy, created with ArcGIS software, will appear on the archive website we are building.[1] This map will include popup windows allowing users to see where the immigrants came from and to track the dates and locations of active migration in and around the Bay Area. With this information and a clearer knowledge of when and where immigrants have relocated, researchers will be able to better understand the socio-political and economic origins of the Italian diaspora.

Service Learning: Benefits to Students and the Community

Service-learning is a pedagogical approach to a subject that helps students learn not only through classroom instruction but also through active engagement. Besides acquiring translation skills, students who participate in this project can use and improve their Italian in a real-world context. Through personal connection with their interviewees, they come to acknowledge the importance of the stories they hear and sometimes follow up by exploring topics connected to the immigrants' places of origin. Many complete the course wanting to learn more about their own heritage.

Immigrant communities are continuously confronted by pressure to "assimilate" to the dominant culture, which for later generations can be felt as a loss of connection to their heritage. Our oral history videos help preserve the immigrants' stories and offer their descendants a tangible connection to their culture, which they can share with their families and pass on to future generations in the oral tradition.

We know many popular narratives of immigration to the United States, but these personal stories provide a valuable insight into local culture, dialect, and history. It is important to Italian Americans to know where their forbears came from and why they settled where they did. Additionally, tracking the patterns of past Italian immigration within the United States can help researchers compare past and present migration patterns of other cultural groups.

Classroom Details: Syllabus Descriptions

The course syllabus that describes the interview objectives and process as follows:

[1] ArcGIS Online (https://www.arcgis.com/index.html) is cloud-based software that allows users to analyze geographic information by visualizing geographical statistics, like climate data or trade flows, through layer-building maps. Many academic institutions and departments, as well as governments and private and commercial institutions, use ArcGIS to create and share interactive web maps.

This project will motivate students to use and improve their Italian across the four major language skills: speaking, writing, listening, and reading. They will also explore Italian heritage and culture. At the same time, they will gain communication and technical skills by learning to conduct interviews, transfer these into digital format, and interpret and synthesize interview information in writing through journals, papers, and online reports.

The following section of the syllabus describes the service-learning component of the course:

Community service is part of the learning process. It is what students achieve and do for others outside the immediate academic environment. Members of the Italian American community who participate in this project will benefit from having their oral histories recorded for posterity, while students will gain a deeper understanding of the Italian immigrant experience while enhancing their Italian language skills.

Classroom Details: Activities and Assignments

The following section describes the activities and exercises used during the first and second parts of the semester, leading up to the presentation of the final project.

Preparation and Practice Interviews

Students prepare for the interview by participating in a series of activities designed to: 1) improve their language skills; 2) explore relevant cultural aspects of Italian and U.S. society at the time the interviewees immigrated; 3) Engage in a process of reflection about what they are learning and its real-world implications; and 4) become familiar with the technology required to record and edit the interviews.

Improving language skills

During this phase of the project, in addition to grammar, students need to learn how to converse with a native speaker. They develop strategies to apply when they don't understand what the person is telling them, how to follow up on questions, and how to master the "W's" (who, what, when, where, why), considered essential to the practice of reporting.

At the beginning of the semester, we work on oral comprehension. While listening to interviews originally broadcast on Italian TV and now available on YouTube, the students attempt to find the subject and the verb of each sentence and understand the discussion as it progresses.

Another group of exercises focus on the students themselves. Each one is required to post a brief personal history online, as well as a set of questions that they would like another person to ask them. Then, in class, they practice asking and answering each other's questions. For the midterm, they select a classmate to interview and record the conversation on video. We usually watch part of these interviews in class and comment on them.

It is important to make sure that the students can stop the conversation if they don't understand what an interviewee is saying. I encourage them to ask, "can you repeat, please? I don't understand. Can you make that point again?" Repetition is beneficial both to the interviewees, because they get to rephrase their answers, and to the interviewers, who get to refine their speaking and comprehension skills.

Exploring cultural aspects of Italy and the immigration process

To conduct successful interviews, we must be familiar not only with the subjects' background, but also with the places they came from and the time periods when they left. As a first step toward gaining this information, the students contact their subjects by phone or video conference. They may also visit their subjects a few times before the actual interview takes place.

The students then conduct research on the regions their subjects came from and the primary events that were likely to influence their lives. This information will help the students formulate questions to ask during the interview.

Some interviews are collective; for example, they may include members of an Italian club or a group of Italians living in a certain neighborhood or attending a particular school.

Reflecting on questions of Italian heritage

The exercises described above are integrated with a set of "reflections," which we express orally, in class; in writing, at home; and/or during a collective forum.

Engaging in reflection is key for the students to understand the service they are providing the community. I adopt two kinds of reflections in the classroom and online forums. The first is based on the questions, "What? So what? Now what?" The second kind is what I call "ABC" reflections.

Inspired by Kolb and Fry's learning cycle, the Campus Outreach Opportunity League (COOL) developed the "What? So What? Now What?" standard for defining and gauging reflection.[2] Students think about what they have done, seen, learned, and accomplished. They explore the implications of their experience, question how and why it matters, and draw connections between their experience and class content. Finally, they are encouraged to reflect on what can or should happen next and what can or should be done differently.

In our course they also read relevant texts like "Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers" (Baxter & Jack, 2008) and *The Oral History Manual* (Sommer & Quinlan, 2018).

An article by Marshall Welch (1999) outlines the basic approach to reflection as a learning mechanism. It emphasizes the pedagogical importance of focusing on what students feel; how they behave before, during, and after a learning experience; and what they learn in the process.[3] These components are incorporated into the "ABC" rubric, in which students consider A) affect (What and how do you feel, and why?); B) behavior (What did you do? What have you done in the past? How will you behave in the future?); and C) cognitive connection to class content (How is your activity related to the class objectives and material?). My students present their reflections orally in class, and in written form at the end of the interviews.

[2] The cycle consists of the following steps: experience; observation and reflection; formulation of abstract concepts; and testing concepts under new situations. The most recent exposition is Kolb (2015).
[3] Welch and Plaxton-Moore (2019) further refine the concept in a later study.

Acquiring and mastering technical skills

From the syllabus:

Technology: Students will learn how to use programs like iMovie 11, iDVD, and Windows Media Player.[4] Gaining familiarity with such software is vital for producing the digital media package that the students will offer as a gift to their interviewees.

Through St. Mary's Instructional Technology (IT) Services Department, I invite a technician with expertise in video production to visit the class. The technician brings the equipment needed to record the interviews and explains how to set up the camera or phone on a tripod, frame an image, and apply optimal lighting. Students learn to work in teams, with one only operating the camera so that the other can concentrate on conducting the interview.

Once the interview is complete, it must be translated into English: A substantial aspect of the project. The technician shows students how to use the digital tools to edit the interview and add English subtitles.

Interview Process and Follow-up

After the students have met with the interviewees a few times and formulated their questions, they arrange a time and a place to conduct the interview. Interviewees are encouraged to bring photos and documents that they may wish to share. I remind the students not to be overly concerned if they make mistakes during the interview; they will be able to edit them before the final project is completed.

Most interviews take between thirty and sixty minutes. Once they are done, the students download them on a computer and start the editing process, which includes inserting photos and documents and adding English subtitles. Sometimes they will add a podcast they have produced, which expands on a cultural topic mentioned in the video, such as the history of a traditional dish or the subject's city of origin.

At the completion of the interview, the subjects indicate whether they wish to receive it as a YouTube post or, if they don't want it to appear on a public platform, as a DVD recording. Once we record and/or upload the interviews onto the selected platform, we are ready to show the interviews and invite the interviewees to join us on campus for a celebration and viewing.
The event starts with a social gathering, including food and informal conversation. Then each student introduces the people they have interviewed and shows a clip of their interview to the audience. This is a very emotional moment for both interviewers and interviewees: The subjects return home with their interviews ready to share with family and friends, and visibly happy to have made an impact on the students' lives.

[4] Designed for the Macintosh iOS operating system, iMovie (https://apple.com/imovie/) is editing software for videos that can be used on mobile devices and computers. iDVD is an application for Mac OS that allows the user to record digital films, music, and photos to a DVD. Windows Media Player (https://support.microsoft.com/en-us/windows/get-windows-mediaplayer-81718e0d-cfce-25b1-aee3-94596b658287) is an application used for playing audio and video and for viewing images on personal computers running the Microsoft Windows operating system.

Assessment

In this class, students' performance is based on seven criteria. The course grade is determined on the following basis:
1) Class Participation: Demonstrated competency in translating English to Italian and vice-versa, both in spoken and written form.
2) Quizzes: The class covers one chapter of the grammar textbook every two weeks, with a quiz at the end of every chapter.
3) Homework: Students are expected to come to class having studied the vocabulary and prepared to discuss the assigned readings and exercises, most of which come from the textbook.
4) Midterm (Interviewing Skills): Students create a biographical portrait of one of their classmates by means of an interview, recorded on video, including pictures and documents of the subject's life.
5) Technical Skills Acquisition: Students will demonstrate mastery of recording equipment and editing software (iMovie, Windows Media Player, etc.), and produce a final video.
6) Reflections (Italian Heritage): Students will demonstrate an awareness and understanding of Italian language and heritage through class discussion and participation and online threaded discussions.
7) Final Project: The final consists of a presentation of the interviews, in both written and oral form, and the creation of videos and/or DVDs.

Professor's Observations: Summary

With this project I aspire to develop students on many levels, beyond that of language acquisition. Even if they forget much of the Italian they have learned, they will remember that they deeply connected with an immigrant, gained a more concrete understanding of their culture, and made a difference in someone's life.

Student's Observations

I have a more immediate connection to my linguistic and cultural roots than most Italian Americans of my generation. To begin with, I have dual citizenship.

My maternal grandparents are immigrants, both came to California during the 1950s from the same village in the Italian Alps. After my grandfather immigrated to the United States and married, he obtained American citizenship, but kept his Italian citizenship as well.

According to Italian law, a child born to at least one Italian parent, even outside the country, could also claim citizenship, provided that the child was reported to the local consulate. In 2010 my mother decided that she wanted to claim hers, and her children's as well. The four of us were granted citizenship in 2014.

As a child, I also visited my grandparents' birthplace in the far north of Italy, where their relatives—several generations related to my mother's family—had remained. It was a small village, and those who emigrated to the United States continued to use the dialect they spoke growing up. Despite this, my siblings and I never learned it.

With help from several members of my paternal family, including my late grandmother, I have conducted some research about our family's background. Unfortunately, we found only vague, general information. All those who once knew more details have passed on—leaving me with many questions and a realization that the connections to my past are becoming increasingly fragile.

From Language to Community Engagement

To start bridging this gap, I resolved to study Italian in college and was excited to learn that I would have an opportunity to conduct interviews with Italian immigrants during my fourth semester. When I first told peers that this course, Italian 004, was based on community engagement, they could not see the connection—and, in truth, I myself was somewhat skeptical. However, after gaining experience in the program and getting to know the subjects of our interviews, I realized that we were performing an authentic service.

As mass immigration declined and Italians assimilated to American society, they began to lose important aspects of their cultural identity—not only language, but also local customs, traditions, and celebrations. Recording these aspects of their culture helps future generations preserve some connection to their heritage.

Oral History as Service-Learning

Service-learning involves "meaningful community service and critical reflection that promotes learning beyond the disciplinary boundaries" (Pak, 2020). Through this course, some students gained deeper understanding of their family's heritage. Others learned about a culture that was new to them. All of us learned by engaging with our subjects on both an academic and a personal level.

Philip Napoli, a professor at Brooklyn College, considers oral history to be an inherently radical methodology, which requires "interviewers [to] approach their research subjects, their interviewees, with empathy, honesty, and attunement" (Napoli et al., 2020). When the students in our class prepared for their interviews, the instructor emphasized that we were to approach our subjects first and foremost as individuals. Because of this intimate contact, our experience of service-learning was quite different from that of most other students. In scope, it represented four semesters' worth of discipline and learning; in depth, it challenged us to listen actively and persuade others to share their lives with us.

Preparing for the Interview

During the first part of the semester, we mainly concentrated on writing and answering questions, in Italian, to prepare for the midterm and final interviews. We watched and analyzed several professional interviews with native Italian speakers. Each of us interviewed another student, in Italian, and subtitled the first minute of the resulting video. A technician from the campus IT services office came to help us learn camera set-up and video editing software.

Later, as we came to understand, learning a language does not happen in a vacuum. Engaging with native speakers, especially those who want others to master the language, helps develop oral skills in a way that classwork cannot.

Gathering Oral Testimonies during a Pandemic

The Covid-19 pandemic changed our plans, which required us to interview our chosen subjects in person. Due to public health restrictions, our midterm practice interviews were mostly filmed on Zoom. Eventually it became clear that any interviews we conducted with our chosen subjects would have to take place virtually.

I chose to interview my maternal grandparents. Conducted via Skype, the conversation did not feel spontaneous: Their responses were either rehearsed or short. Unfortunately, the screen created a barrier between us. Further, the rural area where they live had poor internet connection, our exchange was limited to the device's battery life, and my grandparents were clearly uncomfortable with the technology.

Several other students reported having similar experiences. Not being able to speak to someone face-to-face changes the dynamic, and on a certain level our conversations seemed superficial. However, we still appreciated the stories that our interviewees had shared.

Immediately after the interview my mother gave me a collection of old family photos, including several showing my grandparents when they were younger and pictures of my great-grandparents that I hadn't seen before. I gathered all those images, and recorded stories I had been told outside of the interview and incorporated them into my edited video. It became a permanent, if incomplete, record of my family's history.

Moving Forward

During Fall 2020 and the following Spring, I joined several other Italian students in an internship project, guided by Professor De Angelis, designed to gather the interviews recorded in past years and compile them into an online archive. This project, still in the developmental stage, will result in a website to be held under the domain of Saint Mary's College of California. It will include an interactive map, designed through ArcGIS (see footnote 1), tracing immigrants' stories and movements through the years.

Collectively, these videos will document the chronological periods when large influxes of Italian Immigrants arrived in the Bay Area. Together with the ArcGIS map tracing geographical locations, they may cast light on the reasons why these immigrants left their country of origin during certain periods and allow scholars to conduct more extensive research into the socio-economic factors that led to their departure.

Student Reflections, one Year Later

Learning the stories of immigrants of past generations not only helps us understand an essential aspect of our country's history, but gives us a deeper, more empathic understanding of immigrant experience in our own time.

Unfortunately, this subject is often overlooked by our primary education system. Through mainstream media and class current events projects, students are taught about immigration as a "system," not about the individual choices people make and the challenges they must overcome when adjusting to life in a radically different environment. Engaging directly in the oral history process "gives students the opportunity . . . to connect. . . to history; to see

themselves as products of a particular society at a specific moment in time; to understand themselves in the world" (Napoli et al., 2020).

I have citizenship in a country that speaks a language I speak only haltingly. Many of my family members still live in the same region from which my grandparents emigrated. Although I barely know them, stories told by my grandparents did provide me with some knowledge of my family's heritage. By filming my grandfather as he spoke, I created a record of an uncommon dialect; by including family pictures in my documentary, I created a central place where this history can live protected, not just in fading memories and pictures scattered across the country.

As generations pass, familial stories become watered down and changed. Immigrants, once removed from their native culture and history and brought into a larger, dominant one, are at risk of losing an important aspect of their collective identity. Gathering oral histories, applying the discipline to record them, and learning to use them as an important element of community service allows us to preserve their culture and heritage, as well as our own.

Acknowledgments

We would like the Faculty Development Department at Saint Mary's College of California for the 2021 Summer Grant that allowed us to work on this article, and the Delmas Foundation for the grant that allowed us to develop the archival website over the 2021-2022 academic year. We would also like to thank our editor Suzanne Cowan for all her work, as well as our bibliographers Jim Cowan and David Sweets.

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Other Resources

Italian 004 syllabus

Italian student evaluations

Motivation in MOOCs: A Qualitative Study on the Design and Evaluation of an Online IELTS Course

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Due to the pandemic, 2020 was an unprecedented year, including for online course providers as one-third of the learners that ever registered on a massive open online course (MOOC) platform did so in 2020. This paper focuses on a MOOC course on IELTS, which is the most popular test-prep language course on Udemy.com. However, despite its overwhelming popularity, upon closer inspection, the course seems out of line with the current body of research on motivation, and motivational supports are by and large absent. In this paper, the authors analyze this Udemy learning experience for built-in motivational supports by applying multiple theories of motivation and learning/teaching. Suggestions as to how to improve the MOOC design are then made. The analysis can potentially shed light on ways to aid MOOC course designers in catering to a diverse student body, including students under stereotype threat. Importantly, the results of this research are deemed generalizable and applicable to numerous other MOOCs for language learning, test-taking, and beyond.

Keywords: Motivation, MOOC, Course Design, Learning Experience Design, IELTS, Exam Preparation, Udemy, Learning/Teaching, Learning Dispositions

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1. Introduction

The IELTS exam is an international high-stakes exam taken by more than 3.5 million people yearly. These people take it for a variety of reasons, the most important of which are to study or seek employment abroad.

The Udemy course named *IELTS Band 7+ Complete Prep Course* is a course aimed to prepare students to take the IELTS exam and pass it with a score of a 7.0 on a 9-point scale. The course is by far the most popular course on English language exams on the platform Udemy.com, with its 100,000+ registrations, a 4.5-star rating (see Figure 1).

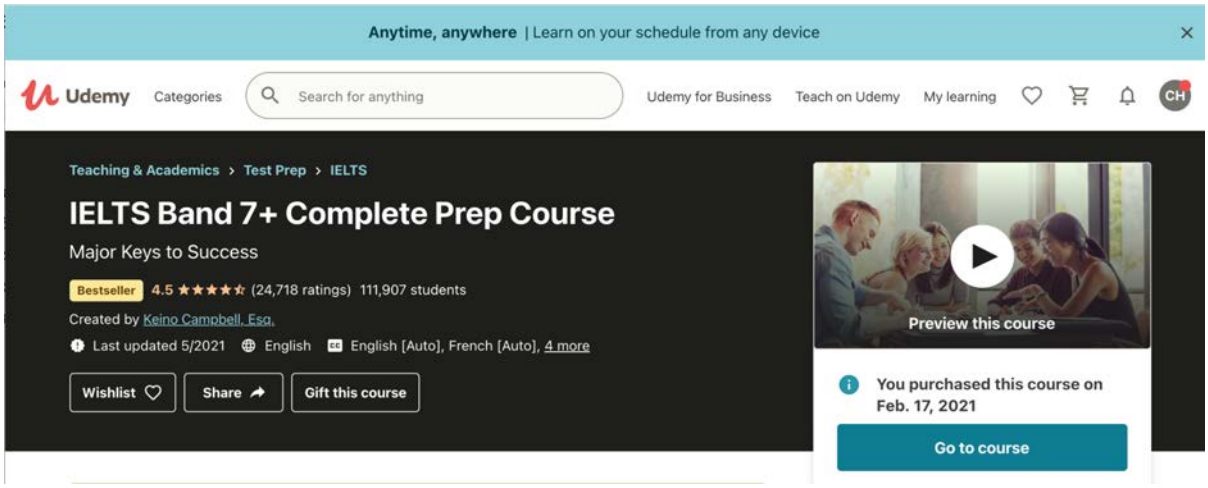

Figure 1: Course Page.

To put the issue in context, due to the pandemic, 2020 was an unprecedented year for online course providers, and one-third of the learners that ever registered on a MOOC platform did so in 2020 (Class Central, 2021). One of the biggest players on the MOOC market, Udemy.com is an American MOOC provider of an open marketplace offering more than 157,000 online learning courses from over 57,000 instructors covering a wide range of topics and being the world's largest catalog of online courses (Shah, 2021). The target audience is students and professionals, and they take courses largely as a means of improving job-related skills. Our analysis of this IELTS course on Udemy could help us comprehend how learners may be motivated by online course designs on Udemy and more broadly, on other MOOC platforms.

The mentioned course looks stellar: its instructor was ranked a Top Performer in exam preparation and was rated a 'Top 10% Most Engaging Instructor', and the reviews that indicate higher completion rates than, for instance, on such major MOOC platforms as HarvardX and edX (Reich, 2019).

Typically, IELTS test takers are non-native speakers, but they vary on multiple other characteristics such as age range, socioeconomic background, learning preferences, and at times even goals. When studying for language tests such as IELTS, people — based on their personal circumstances — choose from an array of common methods of preparation including in-person and online classes, for example, at language schools, one-on-one tutoring, self-study with coursebooks and materials, and online resources. The pandemic has compelled many more learners to opt for the latter option. The exam is a goal imposed by

society, which means this group may need extra support to complete the MOOC (see more on this under SDT).

At first glance, the course does not seem to consider this motivational schism and focuses on several performance-related claims regarding what is possible to achieve using the course: essentially, increase the IELTS score to a 7.0 or higher. The course also promises to address each of the exam skills: Listening, Reading, Writing, and Speaking.

In this paper, we analyze the learning experience on Udemy for its motivational supports by applying the following concepts: self-determination, self-efficacy, the protégé effect, engagement and social identity, and learning dispositions. In doing so, we are going to consider various theories of motivation (see Part 2), based on the evidence we draw from our experience, the course itself and the reviews. Part 3 is devoted to the strengths and limitations of this experience, and possible applications of our findings to new MOOC designs. We also make suggestions as to how to improve the MOOC, which is expected to help our team and course designers clarify the aspects of the experience that affect students' motivation; our findings may then be used to inform the design of a new MOOC on IELTS preparation and beyond.

2. Theoretical Framework for this Experience

2.1. Self-determination Theory

We first consider self-determination theory (SDT), originally put forward by (Deci, Koestner, and Ryan, 1999): people feel more motivated when they believe they have autonomy in making decisions, relatedness to the community, and the feeling they are competent in the task at hand.

On the surface, the course takes care of students' motivation, for example, it offers a contest for 5 hours of individual tutoring. This is evidently extrinsic motivation, which the theory defines as 'performance in order to attain a separable goal,' in addition to the exam itself representing extrinsic motivation as it is imposed by society to prove English competence. Unfortunately, according to SDT, 'all expected tangible rewards made contingent on task performance do reliably undermine intrinsic motivation.' This theory also stipulates that imposed goals 'diminish intrinsic motivation' because they communicate to the student that the locus of causality is external, i.e. this activity is "happening to" the student rather than "caused by" them. Therefore, considering SDT, the seemingly lucrative 5-hour prize does a disservice to a participant, undercutting intrinsic motivation and autonomy.

On a different note, the course seems to promote autonomy as it is self-paced. Students are free to navigate the modules at their convenience, repeating parts of the lessons, and fast-forwarding those already mastered. This freedom to decide on what terms to engage with the course promotes student autonomy as the actions are "congruent with and regulated by one's self" (Deci, Koestner, and Ryan, 1999). However, of note is that all Udemy courses are self-paced by default, and it was not the instructor's design decision.

We now examine another major pillar of SDT, competence. Trenshaw et al. (2016) maintain that through autonomy, e.g. giving students choices, "instructors can help students better internalize their sense of competence." They also argue that giving students personalized levels of challenge, clearly articulating course goals, and delivering on them, helps satisfy the

motivational need for competence. This MOOC, unfortunately, does not both clearly articulate its goals and deliver on them, and offers no personalization.

The least promoted SDT principle in the course may well be relatedness, or a sense of belonging to a group. While it naturally develops from and in group work, the course, as was mentioned above, offers no opportunity to interact with others except for the forum where you are limited to leaving a course review or upvote/downvote another. A suitable place to promote this would be the live session, but from the experience of our team (full description omitted), students in such Zoom meetings get scolded for turning on their cameras and/or microphones, leaving the students with no evident means of interaction except try to conspire through private messages. Therefore, our main suggestion to improve the course in line with SDT would be to build in relatedness supports, or interpersonally meaningful interactions (see more on this in Conclusion).

2.2. Self-efficacy

In this part, we consider how the course promotes self-efficacy, or a person's belief in his or her ability to succeed in a particular situation. According to Albert Bandura (1986), human motivation, well-being, and personal accomplishment are based more on what an individual believes than on what is objectively true. The instructor in the course does in a way convey this message to his students: the message that many people have taken the exam successfully before and that if you participate in the course with an 'intermediate English ability,' you will be able to receive an advanced score (as promised by the instructor).

While this affirmation may reduce negative emotional states and improve students' emotional well-being, it does not mean that the students will obtain the skills necessary to perform. As Carol Dweck points out, "no amount of self-efficacy will produce a competent performance when requisite skills are lacking." To assess the development of requisite skills (which affects self-efficacy), evidence of growing expertise is of utmost importance. Unfortunately, the course almost exclusively relies on worked examples to provide a proxy for this evidence: in the listening section, for instance, the student does not interact with the course except by listening while the instructor is modeling thinking and problem-solving, and it is up to them to infer which of the specific listening skills mentioned they are better or worse at. It also seems doubtful that the students in this course can learn through vicarious experience (Bandura, 1977) from a person whose ability is so dramatically different from theirs, and there is research (Mayes, 2015) that highlights the importance of having 'real learners as opposed to those imagined by teachers' in vicarious learning. This importance compels the authors to suggest including a social component in the course to foster self-efficacy through vicarious learning.

2.3. Growth Mindset and Persistence

As defined by this theory of intelligence, people with a growth mindset believe that intelligence is not a fixed trait, but rather a malleable quality that can be cultivated (Dweck, 2002). Consequently, holding such a belief helps people attribute success to effort and learning, and consider failures learning opportunities worth seeking. Such students are are more interested in learning than looking good. Students not holding this belief tend to quickly become disengaged from difficult activities. There is ample research suggesting that growth mindset belief improves the student's persistence in learning, and oftentimes, outcomes, on the condition that the environment is supportive of the intervention (Yeager, 2019). Having a

growth mindset is therefore beneficial; but how can the instructor in a MOOC support learners' developing a growth mindset? We answer this question first by looking at the literature on mindset.

In the literature on the growth mindset, the following two ways are suggested. The first way would be to recognize and praise students' achievement based on their effort and what happened during the process, rather than for their ability and intelligence focusing on their performance. A shift in thinking from a fixed to a growth mindset contributes to students' motivation in responding to their weaknesses, and have greater persistence in facing failure (Dweck, 2002).

The second way is for the instructor to model the growth mindset to students. This has been shown to have benefits on the student's internalization of the concept (Dweck, 2017).

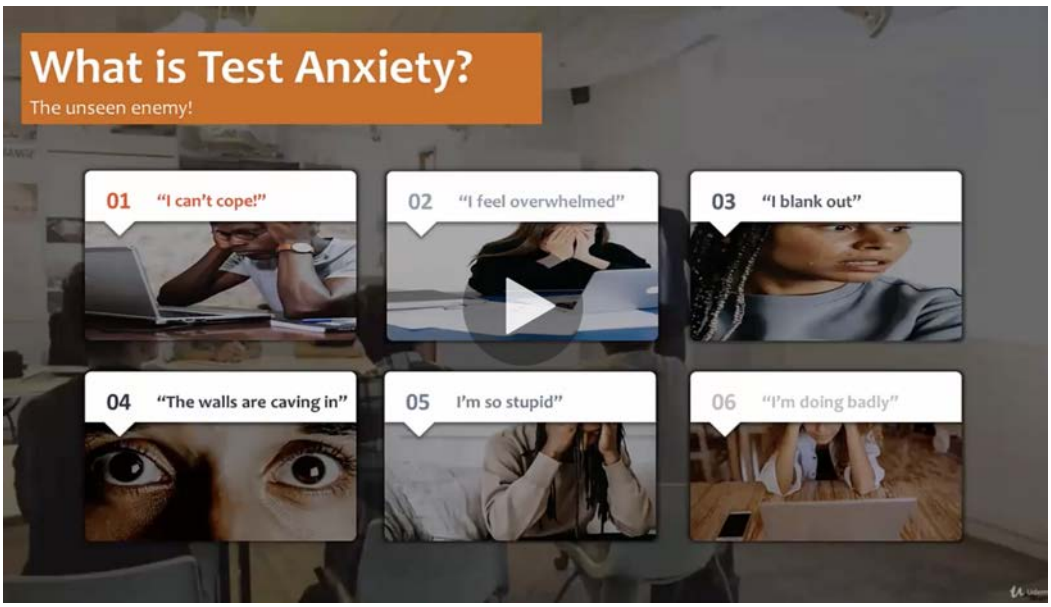

Figure 2: What Is Test Anxiety.

One place where the instructor's attitude to the two mindsets transpires is the first section of the course, 'Managing Test Anxiety,' which is a common challenge faced by many test takers. The instructor's key message is that test anxiety is 'a learned behavior, and any learned behavior can be unlearned' by being aware of the issue and actively counteracting it with adequate strategies.

From various quotes (omitted from this version of the paper), we can see the instructor wants his students to focus on their effort, which would then lead to a desirable overall performance. During the live sessions, the instructor helps students to become aware of the thinking and common myths behind test anxiety (see the slide below).

Figure 3: Common Test Anxiety Myths.

After identifying manifestations of test anxiety — which may exemplify a fixed mindset — the instructor offers strategies to aid students in managing test anxiety. He suggests students to develop an effort and process-driven mindset in recognizing and addressing their emotional and behavioral responses in their IELTS preparation.

As regards the second avenue of research mentioned above, it is interesting to note that the instructor himself considers intelligence as a fixed trait. When stating that the differences between top students and weaker students do not stem from their intelligence, he may implicitly consider intelligence as a fixed trait rather than a malleable quality. This idea is further supported in the course when he says "I have taught students who were not that smart" — which interestingly, happens in an affirmation, as a way to motivate students.

The two pieces of evidence above reveal that the instructor does not yet have a consistent understanding of the growth mindset; we therefore recommend aligning the conflicting thoughts and rectifying the ambiguous language with *Mindset* (Dweck, 2007).

2.4. Protégé Effect

The Protégé effect is a learning motivational theory that claims that people may invest more effort tutoring a protégé about knowledge and skills they do not completely understand and gain more mastery than if asked to learn the same material themselves. This motivational effect is both emotional and social because people have empathy with learners, pride and satisfaction in their protégé's success, and personal responsibility when protégé fails (Dede, 2021).

In one study (Chase, 2009), low-achieving students tend to avoid difficult learning tasks or give up quickly due to the fear of failure while the teaching agent (protégé) creates a situation where the responsibility for failure is distributed between the teacher and the protégé, hence the students can better acknowledge failures and work harder to learn to address them.

In preparation for a high-stakes test, the protégé effect can be a meaningful motivation theory to incorporate in the design of the learning experience. Currently, the course platform contains a Q&A section below each of the course sections (see below). The Q&A function

provides an opportunity for the learners to raise questions instantly when they encounter a specific challenge or problem during a study session. Currently, the communication in the Q&A section is solely between the instructor and the learner.

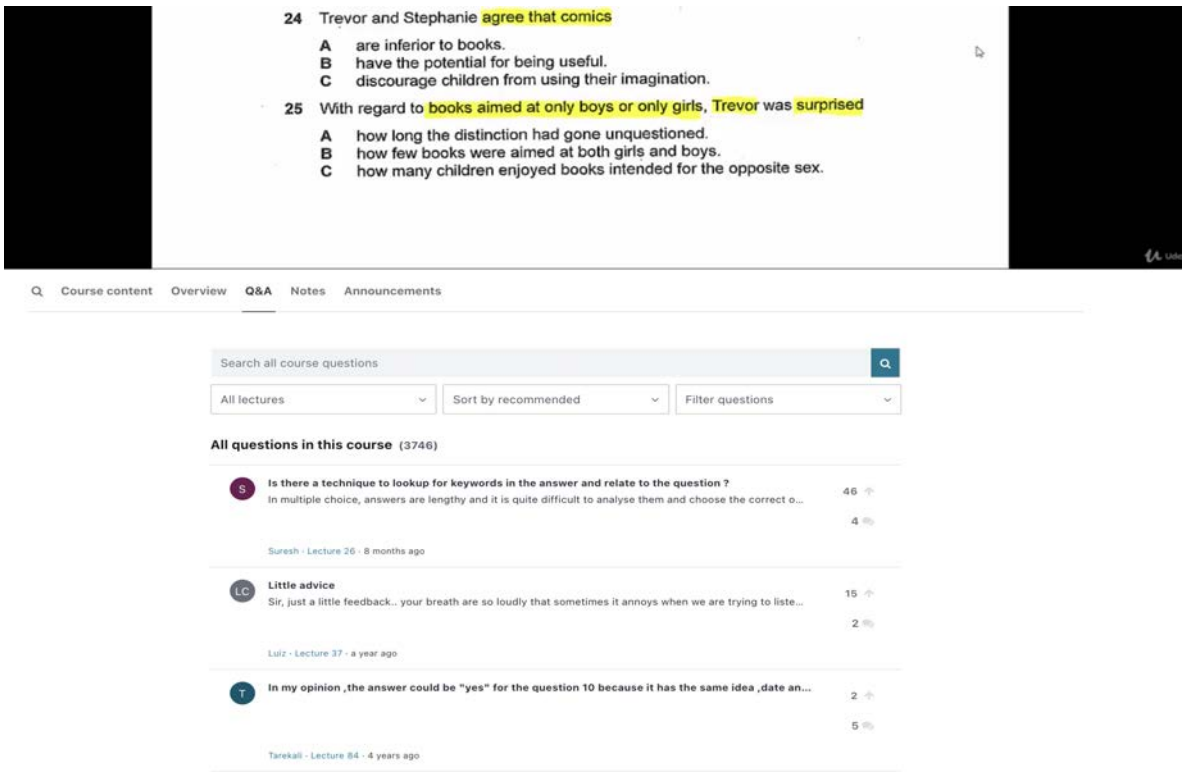

Figure 4: Course Q&A Function

In terms of the protégé effect, this Q&A section can potentially become a meaningful space for learners to answer each other's questions, resolve problems, and attain mastery. Also, learners preparing for a high-stakes exam, especially in an online environment can feel isolated. Therefore, as in many other places in this analysis, social engagement with peers is our recommendation to the course designer as a means of improving motivation (Croft et al., 2010).

In addition to the Q&A function, one other possibility is also social by nature and consists in incorporating peer support: either by giving students time during the monthly live zoom session or by assigning a partner as a protégé to support mutual learning and become more motivated through peer engagement. There are already role models, e.g. the Learning Community Project (LCP) in Mexico (Rincón-Gallardo and Elmore, 2012). A possible limitation of this recommendation is whether peer tutorials like those in LCP are as effective online as in a face-to-face context.

2.5. Learning Dispositions

The learning experience affects at least two learning dispositions pertaining to drive and motivation: 'grit', or persistence, and openness to problem-solving. The former was briefly mentioned as benefitting from a student's growth mindset, but in this Part, we are going to further explore the connection between persistence and the content of the course. As the PISA 2012 (OECD, 2013, p. 64) report states, 'If students never encounter failure and are never challenged they will be unable to develop the stamina, perseverance, and motivation

that are needed to thrive in difficult conditions.‘ However, the course offers worked examples of IELTS tasks presented by the instructor, with very limited opportunity to check one’s work and subsequently know if you failed or not. Thus, the MOOC we consider in this paper could be improved by giving the students a chance to practice the questions and at least learn whether they were successful.

The other learning disposition that could be better supported is openness to problem-solving. In the course, there is no task that is open-ended or ‘requires students to think for a long time,’ which is associated with both higher perseverance and openness to problem-solving (OECD, 2013, p. 187). Another useful recommendation in this respect would be to include a tool to help students learn from, very much in line with *Mindset* (see above).

2.6. Engagement and Social identity

With the increasing popularity and enrollment of MOOCs, there is continuing attention to educational equity and the completion rate gap between affluent populations and those less well-off. In (Kizilcec et al., 2017, p.251), the authors point out that members of underprivileged groups “may suffer from the cognitive burden of wrestling with feeling unwelcome while trying to learn and, therefore, underperform.” Social identity threat refers to “the fear of being seen as less capable because of one’s group,” and it can impair learners’ working memory, learning, and performance (Kizilcec et al., 2017, p.251). This piece of research is particularly insightful in regard to the suggested activities to lessen social identity threat.

The article suggests two different interventions to improve students’ engagement with the course, one aimed at social belonging and one at value affirmation. In performing the former, we ask the student to reflect on the fact that most students feel that they may feel alien to the course while the latter asks the student to connect the content and usefulness of the course to their personal values. In the course survey at the beginning of each MOOC in the research, the learners completed a writing activity to affirm their cherished personal values, such as relationships with family, and reflect on how taking the course reflects and serves their values. For example, in the study, one learner wrote “I need this course mostly for changing my career, which will help me spend more time with family” (Kizilcec et al., 2017, p.251). In addition to value-relevance affirmation, the study also incorporated social-belonging intervention, which assured learners that doubts about belonging in the course are normal, would pass soon, felt by many people, and with time everybody would become comfortable. Each of these two interventions increased the persistence of learners’ from less-developed or stereotyped groups.

In our analysis of this IELTS MOOC course, we find that unfortunately, this IELTS course does not use any of the interventions with its students, and does not have any survey at the start of the course, which leads us to our recommendation. Given that the learners for this course are English as a second— or even third— language speakers from all over the world, mainly from non-Anglophone settings, and may be stereotyped to have weak English ability, we can support these learners by helping them affirm their values and belonging by incorporating a pre-course survey. The survey can offer a space for the learners to write about their reason and goal for taking the course, reflections on the most important values, challenges they foresee in taking the course. This survey can also incorporate past students’ testimonies on how the challenges are not unique and were previously overcome.

2.7. MOOC Retention

As MOOCs provide learning opportunities to a global audience, retention remains to be a frequently studied topic, at around 10% retention for people in the developing world countries (Liyanagunawardena, Adams, and Williams, 2013). In Kizilcec et al.'s (2017) study, social identity threat has been identified as one of the reasons for people from less-developed regions deciding to drop out from a MOOC course. In addition, based on Hone and Said's (2016) study, a post-MOOC survey for 379 participants from a developing country (Egypt) identified MOOC course content as a significant predictor of MOOC retention, mediated by its effect of content on the Perceived Effectiveness of the course. This research also shows that interaction with the instructor is important for learner retention and suggests that "MOOC providers need to think carefully about how to provide appropriate human interactive elements to their courses as well as excellent content" (Hone and Said, 2016, p.166). These two constructs explain a substantial percentage of the variance in retention. In our analysis, we will look at how the course content and social aspect impact the learners' motivation during the learning process.

Our focus of analysis is also supported by the large-scale research done by Gregori et. al's (2018) study which investigated learner support strategies for success and completion of MOOCs. In the study, such strategies are analyzed on three levels: student-content, student-student, and student-teacher interactions. According to this piece of research, the teachers' presence during the course, his or her interactions with students, and the quality of the videos presented are significant determinants of course completion. Amongst their other findings, unfortunately, the quality of MOOCs' course content and pedagogy is commonly thought of as low (Margaryan, Bianco, & Littlejohn, 2015). The research indicates that learner support in online learning has well-documented benefits according to the literature but largely overlooked in the instructional design of MOOCs; an important finding in regard to our main suggestion is that learners who participate socially and who collaborate in open social learning spaces perform better than students who work on their own.

For our analysis and for the purpose of improving or designing a new IELTS MOOC course, it is helpful to consider some of the other findings and suggestions offered in Gregori et.al's (2018) study: frustration (see an example in Part 3) can stem from poorly designed activities, such as discussions, arguments, posting in forums, ambiguous instructions and — importantly — the use of peer reviews. The other extreme which also causes dissatisfaction in students may be a lack of discussion in a forum, a lack of incentive to participate, insufficient prior knowledge, ambiguous assignments, and course expectations, and a lack of time due to personal priorities and commitments. As for instructors, useful strategies for maintaining their presence include commenting at the beginning of each module, reminding of the necessary resources, encouraging social participation in the forums so that students can improve their comprehension and collaboration, and staying present by acting as a figure who responds to students' concerns and suggestions and provides feedback on their comments.

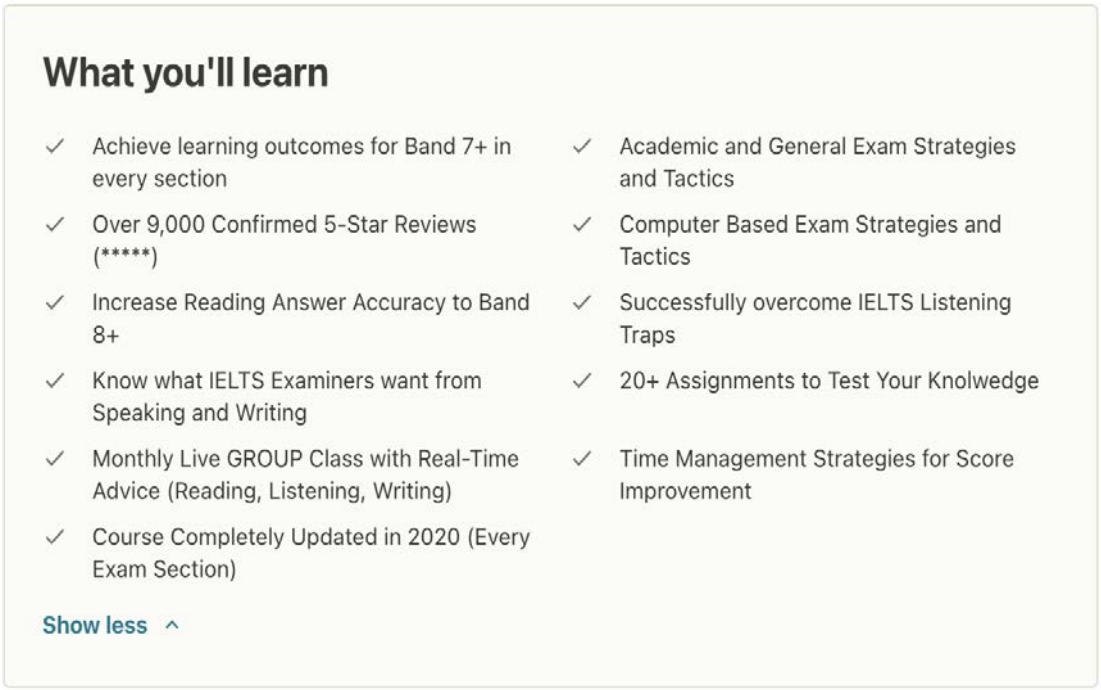

Figure 5: Course Goals: What You'll Learn.

Considering these research findings in relation to our selected IELTS MOOC course, we argue that the instructor of this course does not consider the social aspect of learning to be a priority for this course. According to the course page learning goals listed above, we find that the instructor dedicated his thinking and time to the scope of the course content, which is undoubtedly one of the critical aspects for test takers. However, the learning experience matters because it improves learning outcomes when it comes with effective teacher-student and student-student support. We explore these aspects in more detail in Parts 3 and 4 with our personal learning experiences and other participants' testimonies.

3. Overall Assessment of the Experience

Based on our analysis and learning experiences, we believe that the selected MOOC course does not explicitly consider motivational theories in the course design, and in this paper, we have explored various ways this course can be improved in terms of motivation and learning.

One evident strength of this course is its clear way of tracking progress (progress bar). The diverse student body comes from a background with various life commitments and schedules, and this allows such learners to plan their individual learning journey based on their needs and availability. However, according to Gregori et al (2018), compared with online courses with pre-set weekly goals, one can argue that the self-paced function may lead to learners losing track of their studies without specific time-constrained goals, thus resulting in low course completion rates. We think it would be helpful to include neutral reminders throughout the course to help learners set their own learning progress goals and adjust them as necessary.

One strong selling point of this course is that it includes a complete set of teaching and learning materials as downloadable resources. The idea of purchasing a comprehensive IELTS knowledge and skills pack is attractive and motivating. Importantly, the course is

available (on the internet), accessible (with discounts), and convenient (with its desktop and mobile versions) to a wide range of learners.

Regarding the limitations, we argue that the core problems are situated in social learning, or rather, lack thereof. Currently, the course foregoes the opportunity to establish a way for the student and the instructor and/or peers to interact. Q&A is the place for students to discuss questions, but entries in this section remain short and mostly unidirectional. The monthly live zoom session is present but serves as an additional lecture with optional practice, where the instructor strictly forbids students to turn on the camera, let alone speak. Students do not know their peers who are taking the class, and there are no opportunities for students in such sessions to talk with each other. Hence, compared to offline classrooms, students lose meaningful opportunities to engage in peer learning, with all the devastating effects this often has on motivation.

Finally, the current edition of the MOOC does not seem to incorporate intrinsic motivation in the learning experience. The students in this course have to make do only with the extrinsic motivation of passing the high-stakes exam and reaching a band 7+ score in IELTS. They also try to win a 5-hour coaching prize, and at times achieve the target number of corrections in quizzes.

4. Conclusion

Our research team set out to find a way to make a popular MOOC better, and we carefully dissected the course with multiple theories of motivation. What we found is that despite its massive commercial success, much remains to be clarified regarding this learning experience, and some aspects of it need adjusting, see the paragraphs below for suggestions (made actionable wherever possible).

First and foremost, we recommend considering motivational theories in the learning design, and adding a social component, which is expected to be a significant improvement for the MOOC as it pierces multiple theories of motivation and learning/teaching. Another suggestion is to spurn all the extrinsic motivation and fixed mindset in the course. These main suggestions are shown in Fig. 2.8.

Before clarifying these, it is important to point out that they have associated costs for the instructional team. Another important consideration is that we agree that the IELTS score correctly reflects a person's English ability; admittedly, this is a simplistic view because of social identity threat (Aronson, 2009). To mitigate the possible effects of this threat is a difficult endeavor, but both the literature (Steele, 1999) and this paper make suggestions concerning this.

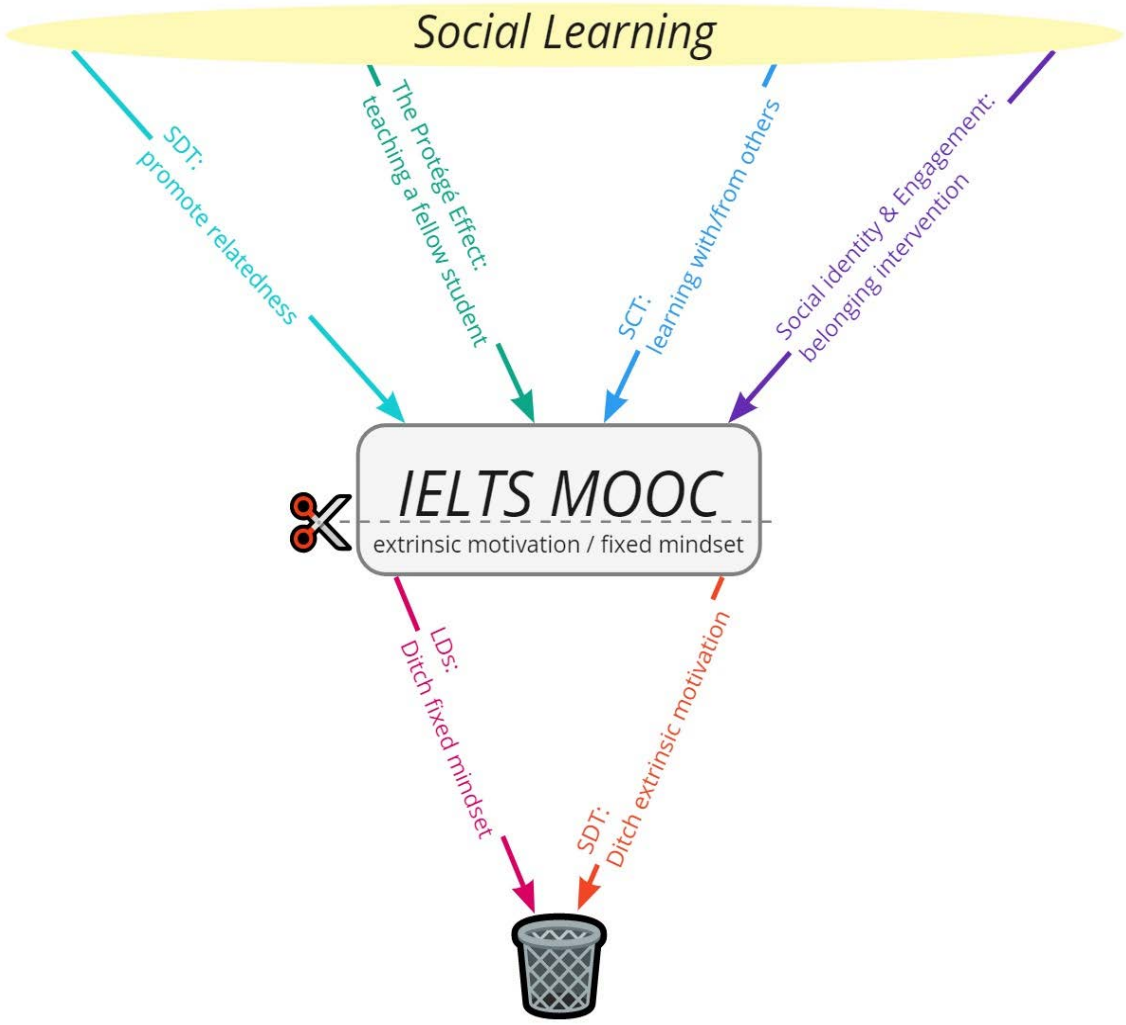

Figure 6: Main Suggestions for the Course.

SDT demands a clarification of the mixed messages this course sends concerning autonomy. It also suggests adding supports for relatedness including in live sessions as well as supports for competency in the form of personalization.

An SCT lens we employed helps us clearly see the MOOC needs to foster self-efficacy through vicarious learning from other students, which means a social component is recommended.

As regards Growth Mindset and Persistence, the instructor needs to recognize the student's growth not ability, but first, he would need to internalize this idea himself because now he does not model a growth mindset as an instructor. A suitable intervention would be to explain the difference between the mindsets and then update the content, connecting various ideas mentioned in the course, e.g. test anxiety, to *Mindset*.

The Protégé effect could manifest itself in an opportunity to tutor and coach others, e.g. in a live session. Organizing this practice may be very costly as this might mean hiring extra staff.

In terms of Learning Dispositions, persistence would benefit from an intervention based on *Mindset*. Another support here could be to include more tasks to work with, including

interactive ones. The second learning disposition, openness to problem-solving, benefits from a growth mindset, as well as open-ended tasks and projects.

Social Identity and Engagement could be promoted with the two interventions mentioned above: value-affirmation and social belonging affirmation. Value-affirmation could be promoted in a cost-effective way in a writing exercise where the student would be able to connect their values with the course, its content, and its completion. Social belonging could be promoted in a pre-course survey that could include a story of how a person with a similar background succeeded in a course after feeling alienated and 'othered.' However, an important thing to consider is that majority students may not benefit from this last intervention, and the course would need to be laser-focused in who it offers the intervention to.

In terms of retention, the course would benefit from the two mentioned affirmations. The research team also recommends removing ambiguous instructions from the course and making sure various aspects of the course (such as the repetitive style of instruction) are less frustrating to learners.

A few important questions — beyond the scope of this paper — arose during our research: whether the students in this MOOC do develop the necessary English skills (as indicated by their IELTS score) through the course experience; whether they use supports within or without the course; whether the nature of the overwhelmingly favorable course reviews is authentic.

Should the instructor of the Udemy course decide to follow through with applying our suggestions, the course, with its added facility, support, and engagement, may shine a new light, a light to guide many more people on their academic and professional lives.

Acknowledgements

The authors would like to express their deep gratitude to Chris Dede, Timothy E. Wirth Professor at the Harvard Graduate School of Education, and his teaching fellows in the 2021 edition of the course named Motivation and Learning: Technologies that Invite and Immerse (T545).

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A Reflection on Personal Bias to Create an Inclusive Learning Environment

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The COVID-19 pandemic has exposed several areas of student need. It has also revealed and magnified the societal failures that have caused inequities in our classrooms. Creating an inclusive digital space begins with self-work. This paper explores the role of color-blindness in society and how to counter its effects. Additionally, self-awareness as a means to strengthen cultural competency through practices like the racial autobiography and personal reflection are discussed. Furthermore, methods for speaking up against bias to address the inequities and challenges in the digital classroom are considered.

Keywords: Race, Self-Awareness, COVID-19, Digital Learning, Reflection, Bias, Equity

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Introduction

To begin this journey of self-reflection, it is necessary to reflect on why this work is needed. This topic is critical and is a parallel process of working on ourselves and working to support our marginalized students. While we are on this journey of self-reflection, it is important to acknowledge and accept that racial inequity is not just a "Black or Brown problem," but a problem that affects all of us. Singleton (2013) explains that we must stay engaged in uncomfortable conversations, be ready to experience discomfort, speak our truth, and expect, as well as accept that there may be unresolved issues because there is no quick solution. Student concerns and their challenges might result in this discomfort and in many cases these challenges will not have an immediate cure, just as the uncomfortable conversations about race.

Student Issues and Challenges

With an overwhelming amount of responsibilities and duties, educators may fail to notice students who are experiencing food insecurities, unemployment, loss of loved ones from COVID-19 or other illnesses, isolation, depression, domestic violence, single-parenting stress, and racism. This transition to online learning occurred abruptly. Some students didn't have access to courses due to lack of technology and Wi-Fi, while others had to care for their families or manage other issues that may directly relate to their privilege (Addy, et al. 2021). This digital learning was not representative of the student population and their needs. Students require a learning environment that is mindful of the cultures that they bring to the classroom. Inclusive spaces do not just revolve around a White, middle-class reality. The type of curriculum or pedagogy required to support students in an inclusive environment is a culturally responsive one; this consists of meaningful assignments and discussions that are part of students' lives.

Culturally Relevant Pedagogy

Educators seeking to create an inclusive learning environment, may utilize culturally relevant and responsive frameworks (Addy, et al., 2021). Utilizing culturally relevant pedagogy involves supporting all students to academically succeed, understanding their own culture, building competence, and gaining a deeper understanding of social inequities (Ladson-Billings, 2006). This framework also supports students to experience learning that is relevant to their personal lives, and enhances their learning through the integration of meaningful experiences for students (Addy, et al. 2021). Culturally responsive pedagogy empowers students academically and socially, with a multidimensional approach of educating students, that builds on student strengths and freedom from the oppression of the structures in education (Gay, 2010). This framework establishes inclusion to, first and foremost, connect students and teachers. An example of culturally relevant pedagogy would be a project that requires students to conduct research in their own communities and neighborhoods; this would integrate their perspectives and possibly offer a solution to an issue that directly impacts the local people (Addy, et al., 2021).

Beginner, Ally, Activist

A reflection of personal bias includes a self-analysis of one's commitment to creating an inclusive environment. This self-reflection requires educators to consider a stance of being a beginner, an ally, or an advocate. As a beginner, there is care about joining others in creating

a safe and welcome society, which includes the learning environment that opens the heart and challenges your thinking. As an ally, there is a willingness to speak up and challenge within a specific circle of people, with the understanding that this work is life-long. Educators as allies exists across identity lines, as they recognize oppression regardless if they belong to the targeted group or not. (Gaffney, 2016). As an activist, this is the work that seeks to tear down oppression, although there are times when the oppression of others from the activist, requires a self-confrontation.

More and more educators are joining activist groups to struggle for educational justice, however they are still a small fraction (Picower, 2017). Whether the stance is that of a beginner, ally, or activist, there must be a starting point to this self-reflection to create an inclusive learning environment. Whether advocating for marginalized students or supporting their fellow educators, teacher allies must accept the responsibility to focus unwaveringly on how power and privilege function in the school environment and beyond (Gaffney, et al., 2016). Teacher activism and the work inside the classroom involves developing caring and respectful student relationships and culturally relevant curriculum and pedagogy (Picower, et al., 2017). These inclusive learning environments diminish traditional roles between teachers and students (Freire, 1970). Teacher activism requires a comprehensive lens that views each student as a unique individual. Activism that takes place in inclusive learning environments allows the space to value all students as individuals with distinctive qualities.

Color-blindness

Color-blindness as a racial ideology has been embraced in the United States since its original application in Plessy vs. Ferguson, 1896 (Plessy vs. Ferguson, 1896). This commitment to color-blindness influences most aspects of education, as evidenced by educational policies and practices that integrate color-blind language, the plethora of color-blind approaches to educational research, policy analysis, and teacher education discourse (Annamma, et al., 2017). According to Asare (2017), "*Color-blindness* is the racial ideology that posits the best way to end discrimination is by treating individuals as equally as possible, without regard to race" (para. 5). This perspective is particularly problematic in consideration of students and the ways they interact with their teachers and peers. Color-blindness may look like:

- I don't see color. I just see people.
- We're all just people.
- I don't care if you're black, white, green, or purple-polka-dotted!
- #AllLivesMatter (Fitchburg State University, 2021).

There are several ways in which color-blindness serves to perpetuate racism. The term *blind* means having a narrow field of vision (Hallahan, et al., 2019, p. 276). In relation to color-blindness, individuals are choosing to not see race as well as the racial inequities, disparities, historical and contemporary violence and trauma perpetuated in a racist society. Prescribing to a color-blind belief not only dismisses the lived experiences of people of color, but also suggests that racism does not exist as long as one simply ignores it. Within the milieu of persistent structural and systematic racism, racial color-blindness serves as a means to withdraw from conversations of race and racism altogether (Asare, 2017). Further, when race-related issues occur, color-blindness lends itself to the individualization of conflicts and shortcomings, rather than examining the larger issues embedded with cultural differences, stereotypes, and values placed into context (Williams, 2011).

Wanless (2018) identifies three Racially Responsive Teaching Practices in education as the Color Blind Approach, the Color Aware Approach, and the Social Justice Approach. These methods range from low racially responsiveness to high, with social justice being the ideal practice. To begin, within The Color Blind Approach educators "adopt the policy of not seeing or being influenced by their students' race. In this approach, teachers do not engage in direct conversations or discussions with children about race" (para 1). However, as Wanless (2018) points out, not talking about race still sends messages about race whereby non-White students' lived experiences are unseen and ignored in the classroom. When teachers dismiss race and conversations about race, students are left to develop their own understandings and draw their own conclusions, which may be biased, naïve, or ignorant.

The second Racially Responsive Teaching Practice, is the Color-Aware approach, which is an improvement upon the Color-Blind approach where educators "intentionally celebrate children's racial differences as an important part of who they are and teach children about race in direct and honest ways" (Wanless, 2018, para. 2). These types of teachers engage students in discussions about race, intervene when students ask questions, and clarify misconceptions. Students are taught that talking about race is okay and teachers pursue materials and supports that can assist in keeping these critical conversations going.

Finally, the ideal approach educators can adopt is the Social Justice Approach. Teachers are not just talking about race but "actively empowering young children to recognize and act on race-related injustices. This means involving them in projects that allow real participation in the process of change" (Wanless, 2018, para, 3). Involving children in the problem solving aspect of racial injustices allows them to experience agency, action, and positive social change. This approach is ideal because it not only allows students a safe space to have conversations about human differences but gives them opportunities to critically examine racial oppression in the world.

Multiculturalism is an alternative ideology to color-blindness that educators can adopt in which individuals acknowledge, highlight, and celebrate ethnoracial differences (Williams, 2011). Shifting perspective from color-blindness to a multicultural approach can be challenging. Through McCabe's (2011) research, three main ways of how to "do multiculturalism" were identified: (1) recognizing and valuing differences, (2) teaching and learning about differences, and (3) bridging differences via personal friendships and organizational alliances. Schools are the perfect context to engage in these practices. Educators who embrace a multicultural ideology facilitate learning through a lens that both recognizes and celebrates differences.

Self-Awareness and Cultural Competency

Daniel Goleman (1995) describes "self-awareness as being aware of our mood and our thoughts about that mood. It is the ability to recognize your emotions and thoughts, how they influence behavior, and making accurate assessments of our strengths and limitations" (as cited in LaBarbera, 2021, section 1). For educators, self-awareness encompasses the understanding of the ways in which our thoughts, feelings, and behaviors influence our interactions with our students. Self-aware teachers are cognizant of their own emotional demeanor and conduct as well as how they affect their students and how students' behavior affects them (LaBarbera, 2021). It is through self-awareness that teachers can begin to conceptualize cultural competency.

Striving for a personal awareness that strengthens cultural competency is an acutely individual process. This type of development includes several essential principles as described by Learning for Justice (n.d.):

- Asking oneself how issues of sameness, difference and power affect interactions with colleagues, students and families
- Genuinely seeing diversity as a strength and an opportunity, rather than an "issue" or problem
- Understanding how one's own life experiences can help build relationships with students and enhance curriculum
- Thinking about what each of us still needs to learn and engaging in relevant professional development, dialogue, study or personal reflection
- Developing skills and attitudes that can help bridge cultural differences. These include empathy, flexibility, listening without judgment, appreciation for multiple cultural perspectives and cross-cultural communication (section 5).

Considering the ways that personal perceptions of concepts, like those above, help teachers strengthen their own awareness as related to cultural competency. It is essential for teachers to increase self-awareness in an effort to understand how their perceptions affect their students. There are a plethora of strategies and practices teachers can employ to build self-awareness as related to cultural competency, including the Racial Autobiography and Personal Reflection.

Racial Autobiography

A racial autobiography, simply put, is a personal narrative in which the author explores how race has manifested in his/her own life. The Pacific Educational Group (n.d.) suggests starting with Racial Autobiography Bookends. These bookends require the author to consider both the earliest and most current "events and conversations about race, race relations, and/or racism that may have impacted your current perspectives and/or experiences" (section 1). Once the author establishes an entry and closing point to the racial autobiography, the body can be written.

Several groups and organizations have created guiding questions to support educators in writing their own racial autobiographies, such as The Pacific Educational Group, Iowa Department of Human Services, and Whites for Racial Equity. Questions for consideration typically include elements like *family*, "Are your parents the same race? Same ethnic group? Are your brothers and sisters? What about your extended family -- uncles, aunts, etc.?" (Whites for Racial Equity, n.d., section 2); *schooling*, "What was the racial makeup of your high school? Of its teachers?" (Whites for Racial Equity, n.d., section 5); and *community*, "What is the racial makeup of the neighborhood you grew up in?" (The Pacific Educational Group, n.d., section 3). It is important for teachers to examine when they became aware of their race, and how their racial experiences manifested throughout their lives.

The racial autobiography can be an empowering tool for educators to increase their self-awareness and cultural competence. Many educators, regardless of cultural background, are inhibited when discussing race and racial issues. In some ways, this is because of minimal awareness of their own racial experience and the experience of others who have diverse backgrounds and perspectives. (Singleton, 2015). By integrating exercises like the racial autobiography, teachers can use introspection as a springboard for competently teaching students who come from cultures other than their own. Educators must work diligently to

meet the needs of all learners in their classrooms. In an effort to do this, teachers must participate in continuous professional learning and self-reflection.

Personal Reflection

It is not enough to just acknowledge that implicit bias exists, educators must directly confront and explore their own personal biases. "Before engaging students in dialogue or activities about implicit bias, instructors must begin the work of their critical self-reflection" (University of Michigan, n.d.). When engaging in self-reflection and self-critique to identify personal bias, it is integral that one admits they have biases at the beginning. From there, asking oneself how their biases were formed, what privileges they have that others do not, and examining social groups will provide insight into implicit biases.

Personal biases can be identified in a multitude of ways, such as taking Implicit Association Tests (IAT) and engaging in self-reflection. Specifically, Project Implicit at Harvard University developed a *Social Attitudes* test that gathers information to assess a person's attitudes and beliefs about various social topics such as race, gender, and sexual orientation (Project Implicit, 2011). Using journals or diaries is another valuable tool to help examine one's biases and see where they occur in your life. These provide opportunities to record one's experiences, thoughts, and feelings; this can then be analyzed and used to reflect on how to better approach situations in the future (The Center for Culturally Responsive Teaching and Learning, n.d.).

Moreover, by examining close relationships, one can also expose areas in which they are likely to have personal bias and need more education. Considering the experiences from the point of view of the person or group being stereotyped can assist in self-reflection; this can involve directly interacting with people from that group, or consuming media regarding experiences in which the group may often endure. This personal reflection and self-examination of one's own biases is especially important to those in the field of education. Educators must always be mindful of evaluating each student objectively, assessing the quality of the work and focusing on the student's personal characteristics rather than associating the student based on a group with which they identify.

Application to the Classroom

Many educators are unsure how to appropriately respond when someone uses biased language or stereotypes. One factor that often inhibits speaking up is fear of the consequences. There may be personal or professional repercussions directly (or indirectly) based upon the act of speaking out. Whether these are real or perceived consequences is irrelevant because when educators remain silent, the offensive behavior or language continues. Sanderson (2020) identifies another factor that prevents individuals from challenging inappropriate behavior as confusion about what they're actually seeing or hearing. Is that comment an innocent joke, or is it racist and offensive? Is that spat some harmless bickering, or a dangerous case of domestic violence? "Ambiguous situations like these make it harder for people to step up and act, because we don't want to appear stupid or overly sensitive" (Sanderson, 2020, para. 5). It is easier for educators to push back against clear aggressions. There is often ambiguity in biased language usage, which makes standing up and speaking out challenging.

Teaching Tolerance (2018) reports that the best way to avoid personal silence in the moment of bias, prejudice, and stereotypes is to prepare. When educators believe that they are those who speak up when witness to injustice they shift from inaction to action. Once this mindset has been established, it is essential for teachers to plan responses that will acknowledge bigotry in the moment. Replies such as, I am offended by that; That is not funny; or I am really surprised to hear you say something like that, can strengthen one's ability to react directly and immediately (Teaching Tolerance, 2018). Responses such as these can lead to open discussion about the offensive language or behavior or at the very least, give teachers the opportunity to take a stand against bias. Finally, questioning is an effective way to interrupt everyday bias because questions put the responsibility on the person who made the comment. When asked, "What do you mean by that?; Why would you say something like that?; or What point are you trying to make by saying that?" the offender is forced to examine his/her beliefs, (in)tolerance, and bigotry (Teaching Tolerance, 2018, p. 10). If these questions are also asked in a group setting, it also provides others with the chance to get some insight as to why the person believes what they are saying. Other people are also afforded the opportunity to examine bias that they may not be aware of.

Fostering a community of respect and promoting cultural awareness is critical in addressing bias and stereotypes in school; this can be achieved by implementing culturally responsive teaching (CRT) practices. Lynch (2015) suggests several ways which will help educators begin to develop a more inclusive environment and reduce the probability of stereotypical attitudes and beliefs in their classroom. First, educators can encourage students to share about their ethnic backgrounds. Teachers who show a personal interest in their students demonstrate respect for them as an individual. This also serves as a model for other students. A second strategy that was discussed involved teachers serving in more of a facilitator role rather than a typical instructor role. "Students in an authoritarian classroom may sometimes display negative behaviors as a result of a perceived sense of social injustice" (Lynch, 2015, para. 3).

Conclusion

Students bring varied backgrounds, identities, and educational needs to each classroom. Educators need to understand the role unconscious bias plays in discrimination and inequity, and have the tools to develop strategies to prevent and address deficit thinking in the classroom. Cultural competence is a set of knowledge, skills and dispositions that enable educators to interact effectively with students. Elements of inclusive teaching include fostering a positive classroom climate, integrating diverse perspectives and issues of diversity and equity into course content, and inclusive pedagogies.

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Influence of Regional Educational Policies of Municipalities in the Republic of Bulgaria on Teacher Status-Role Models

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The aim of the study is to determine the impact of regional educational policies on the status-role models of teachers. The main research thesis is that the nature of teacher's status-role models is directly dependent on the level of development of educational policies of local government. It is assumed that the more developed these policies are and the more local educational initiatives in which teachers participate, the more relevant, rich and dynamic is their status-role model. The last significantly affects the quality of education provided in the respective Municipality. In the study are analyzed the educational policies of two bulgarien municipalities - the Municipality of Burgas and the Municipality of Vidin. The two have different areas and socio-economic capacities. Respondents to the research are 185 teachers from different stages and levels of the education system and 12 principals of the educational institutions in which teachers work. A structured questionnaire was developed for the purposes of the study. The questionnaire establishes the amount and nature of teachers' involvement in local educational initiatives – on one hand, and the characteristics of their status-role profile, on other. A comparative qualitative and quantitative analysis is performed. Relationships are sought between the level of development of local educational initiatives and the characteristics of the status role profile, which can generally be defined as traditional (conservative) or actual (innovative).

Keywords: Teachers' Professional Roles, Status-Role Model, Educational Polities

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Introduction

Regional educational policies in the Republic of Bulgaria upgrade the national educational policies. They are a key instrument for implementing the European principle of subsidiarity, as they take into account the local context and allow for or adequate solutions in the field of education.

Regional educational policies in the Republic of Bulgaria are implemented through programs and projects with European, national, regional or cross-funding. They are implemented both by the Municipality itself and by educational, cultural institutions and NGOs in partnership or with the support of the municipality. Some of the programs cover all educational institutions in the municipality. Others have a specific focus and scope.

This research is realized among teachers from two municipalities on the territory of the Republic of Bulgaria.

The Municipality of Burgas is in the southeastern part of the Republic of Bulgaria. It covers 14 towns and villages. The area of the Burgas Municipality amounts to 513612 declares. The population according to the last census (15.07.2015) is 232 837 people. The administrative center of the municipality is Burgas city. On the territory of Burgas Municipality are 2 universities and 4 colleges, 1 primary school, 31 secondary schools, 16 high schools, 1 united secondary school, 1 center for special educational support and 35 kindergartens.

In last 5 years Burgas Municipality has implemented solid projects in the field of education, co-financed by European funds, which focus on education and educational infrastructure.

The Municipality of Burgas is one of the few Bulgarian municipalities that pursues a stable policy for the development of educational programs, for which it has been selected as a municipality of knowledge in the national competition „The best city to live in Bulgaria" for several consecutive years.

Currently, the Municipality implements several of its own educational projects and programs:
- The Program "Four seasons for the health of our children" – the aim of the program is to increase the cognitive and motor culture of children from the earliest childhood, through learning and outdoor games;
- The Program "Parents help the kindergarten teacher" – the program is focused on enterprising parents-volunteers who want to cooperate with kindergarten teachers;
- The Program for renovation of children's and sports playgrounds in kindergartens and schools in the municipality of Burgas – the program provides a healthy physical environment for the education of children from three months to seven years of age; creating full conditions for the organization of the school day in order to improve the quality of education and improve the conditions for outdoor sports in municipal schools;
- The Program "My city Burgas" – through this program the educational subject "Local History" is introduced in 12 schools and all kindergartens in the municipality of Burgas;
- The Project "The First Graders' New Start". The project developed and implemented a "Dynamic Classroom model", aimed at supporting the intellectual and personal development of children in primary school through learning in a technology-rich environment[1].

[1] https://www.burgas.bg/bg

Vidin Municipality is in the northwestern part of Bulgaria, near the border with the Republic of Serbia and borders the Danube with Romania. The municipality covers an area of 501 km2. The population (as of 31.12.2017) is 54,737 inhabitants. The municipality include 34 settlements – 2 towns and 32 villages. On the territory of Vidin municipality there are 10 secondary schools, 3 high schools, 1 school for children with disabilities and 14 kindergartens.

The analysis of the financial implementation of the Investment Program for the implementation of the Integrated Plan for Urban Reconstruction and Development of Vidin 2014-2020 (IPGVR) states that in 2018 the implementation of 2 project proposals aimed at education has start: The project "Basic Reconstruction of the Central Pedestrian Zone" and "Improvement of the condition of the educational infrastructure in the city of Vidin" (included two Vidin schools – Secondary School "Tsar Simeon the Great" and High School "Exarch Antim I"), which were successfully completed. Now, no municipal educational programs have been announced, only sporadic competitions and holidays. [2]

Theoretical Background

This study is based on the thesis of the dynamic structure of the teaching profession, understood by many modern researchers as a role play (Grasha, 1996, 2002; Harden & Crosby, 2000; Brown & Douglas, 2007 and others).

The role interpretation of the teaching profession is related to four key concepts and is based on:

- Teacher is a professional official status, which is a basic status of the person, fixing his social, economic, and production-technical position.
- The teacher' professional role is a type of social role and dynamic aspect of the teacher status that includes a set of functions that the person performs to enter a particular work position.
- Functions are part of the professional role of the teacher. They add value or trivialize role scenarios depending on the density and adequacy with which they relate to the content of the role.
- The professional and personal competencies of the teacher determined the specific of the functional structure of the role. Professional pedagogical competence is being upgraded over the personal competencies through special education (Kaloyanova, 2010-2011).

According to that the teaching profession is considered as a dynamic set of a certain (or indefinite) number of independent structural units - components of the teaching profession. They define different aspects of the status of the teacher in the profession. The roles that the teacher assumes in relation to one or another status act in a system and form a "status space". The roles are filled by the teacher with specific functions (Kaloyanova, 2010-2011).

The relationship between status, role, function, and competencies is dynamic and subjective. It could be explained as follows: When expressing in specific situations of the educational environment, a certain status can be "minimized" to a role, and certain roles can be "maximized" to a status (Kaloyanova, 2010-2011).

[2] https://vidin.bg/

Depending on the functions with which the teacher performs a role, it can acquire a current look, regardless of its traditional perception, or be reduced to a traditional one, regardless of its relevance. This process is influenced by the degree of professional and personal competence of the teacher. Each of the constructs - status, role, function, and competence, can be studied both independently and according to its relationship with the other constructs (Kaloyanova, 2010-2011).

Based on this concept, N. Kaloyanova studied the attitudes and the identification of the teacher as a manager, facilitator and tutor, T. Ivanova - as a consultant and mediator, M. Dishkova - as a mediator, Zl. Dimitrova - as an animator, and empirically derives their current status-role models (Kaloyanova, 2010-2011; Ivanova, 2011; Dishkova, 2020; Dimitrova, 2021).

The thesis that professional roles are classified according to characteristics that point to the overall educational philosophy of the teacher (Brooks&Brooks, 1993; Holt-Reynolds, 2000; Siemens, 2005), his teaching style (Grasha, 1996) or the nature of the teacher's interaction with other subjects of the social environment (Rasheva-Merdzanova, 2010) is more widely presented.

Based on studies of various aspects of the manifestation of the professional roles of the teacher, for the purposes of the research a classification will be used, in which 38 professional roles participate, divided into three groups (Kaloyanova, 2021):

- Traditional – with the priority of teaching, which makes them insufficiently effective in modern educational conditions: educator, role model, planner, expert, examiner, informer, preceptor, contractor, observer;
- Transitional – they are valid for traditional education, but with adequate functional structure are applicable in the new conditions: authority, motivator, creator, manager, organizer, tutor, initiator, advisor, consultant, coordinator, listener, supporter, supervisor, distributor;
- Current – often nonconventional, whose functions are related to the modern requirements of the educational environment, incl. in online format – innovator, lieder, mentor, friend, mediator, selector of information, collaborator, moderator, entrepreneur, facilitator, guardian, opponent, competitor, network administrator, animator.

Methodology

The aim of this study is empirically to explain the amount and nature of teachers' involvement in educational initiatives in their relationship with the specific status-role profile of the teacher. For greater clarity, the study uses the term project to denote a project or program with additional external funding. This type of activity is divided into regional, national, and international.

The research methodology include a structured questionnaire with 3 main indicators: Participation in educational projects and programs in the last five years, attitudes to the teachers' professional roles and demographical factors. The Research involved 185 teachers from different stages and levels of the education system and 12 principals of the educational institutions in which teachers work. 112 of the teachers' respondents work on the territory of Vidin municipality and 73 - on the territory of Burgas municipality. 6 principals manage educational institutions (schools and kindergartens) in Vidin region and 6 – in region Burgas.

The research was realized in 3 stages.

During the first stage a number and the specifics of the project activities, which have been realized during the last 5 years in the educational institutions where the researched teachers work, have been established. At this stage of the study the respondents are the principals of educational institutions.

During the second stage the teacher respondents are divided into two groups according to the indicator „Participation in educational projects and programs in the last five years". Three groups were formed:

- respondents who have participated in over 4 projects;
- respondents who have participated in up to 4 projects;
- respondents who did not participate in projects.

Each group was divided into two subgroups - teachers from Vidin region and teachers from Burgas region.

The third stage includes statistical and qualitative analyze of the teachers' attitude to the professional Roles. Within the questionnaire teacher respondents indicate 5 professional roles that they consider important and useful for the modern teacher. The correlation between the teachers'attitudes to the specific groups professional roles according to their participation was determined by deriving of the Spearman rank correlation coefficient (Rs).

A comparative analysis between the level of development of local educational initiatives and the characteristics of the status role profile, which can generally be defined as traditional (conservative) or actual (innovative).

It is important to emphasize that the presented research is part of a larger research project aimed at establishing the influence of various factors on the status role models of teachers.

Results

For the purposes of the research, the distribution of the respondent teachers according to the pedagogical experience will be shown first.

Figure 1 shows that in the group of teachers from Burgas the part of teachers with less pedagogical experience significantly exceeds that of experienced teachers, with the largest percent being teachers with experience up to 5 years. These are teachers up to 35 years.

In contrast, the group of teachers from Vidin is dominated by those with over 30 years of teaching experience, with about 33% of them over 55 years of age.

Regardless of the limited volume of the research sample, the results are indicative of the state of the teaching community in both regions. There is a clear trend towards aging teachers in the Vidin region and their renewal in the Burgas region (Figure 1).

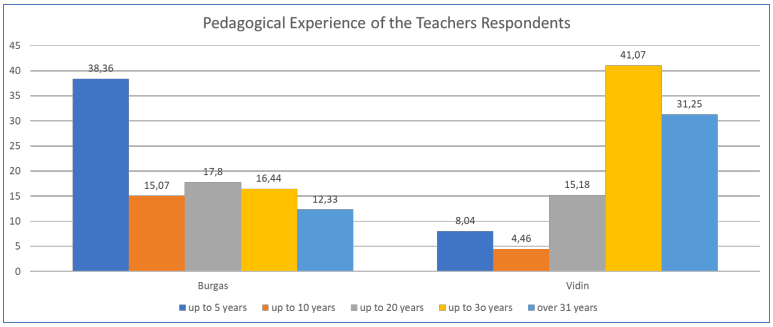

Figure 1: Distribution of respondents according to pedagogical experience in%.

Figure 2 shows the number of projects for the last 5 years in which participate the educational institutions included in the research (according to their principals).

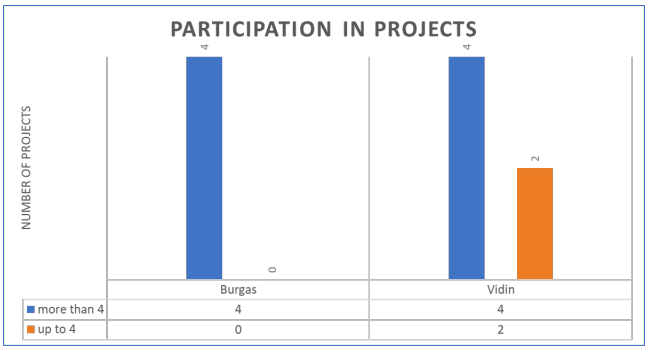

Figure 2: Distribution of educational institutions according to participation in projects

All 6 institutions from the Burgas region have been working on more than 4 projects in the last 5 years. 5 of them work on regional, national, and international projects and 1 - on regional and national (Figure 2).

4 of the institutions in Vidin Municipality are working on more than 4 projects, all national and international. One institution implements one national project and another - 3, including national and international (Figure 2).

As can be seen in Figure 2, 6 institutions in the municipality of Burgas are implementing regional projects, while no institution in the municipality of Vidin is working on local educational initiatives.

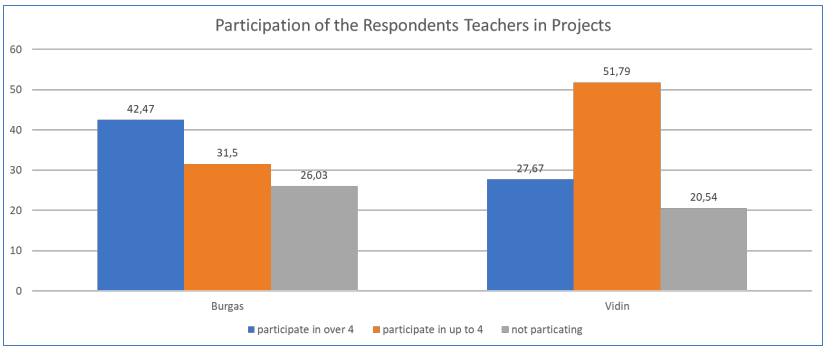

Figure 3: Distribution of respondents by indicator participation in projects in %.

The following figure emphasizes the trend, the participation of a larger percentage of teachers from the Burgas region in more and various projects, at least one of which is regional (Figure 3).

The shown demographic data, without claiming to be exhaustive, are the basis for the assumption that a stable educational policy of the municipality of Burgas has a positive effect on the teachers‘ professional profile.

Table 1 shows the correlation between attitudes towards the professional roles of teachers in groups and subgroups measured by the Spearman rank correlation coefficient (Rs).

Table 1: Correlation between respondents’ attitudes to the teachers’ professional roles according to the participation in the projects.

Rs	**Traditional Roles**	**Transitional Roles**	**Current Roles**
Participate in more than 4 projects	0,73	0.87	0.88
Participate in up to 4 projects	0,71	0,95	0,70
Do not participate in projects	0,35	0,79	0,93

The Spearman rank correlation coefficient (Rs) shows a strong relationship between the attitudes of teachers from the two regions, who are involved in more than 4 projects, to the professional roles they perform (Table 1).

The dependence between attitudes towards traditional roles is 0.73. It increased in the transition roles to 0.87 and is highest in the current roles – 0.88.

The same coefficient is more volatile in the group of teachers who participate in a limited number of projects (up to 4 for the 5-year period). The ratio of the attitudes of these teachers to transitional roles is very strong - 0.95, and it is significantly, but lower, between the attitudes towards current and traditional roles (Table 1).

Another statistical trend is the very low dependence between the role attitudes of teachers from Vidin and Burgas, who do not participate in project activities, to traditional roles (Table 1).

It can be summarized that statistically there are three main trends:
- about proximity of the attitudes to modern status-role model of the teachers from Burgas and Vidin in the two opposite groups – the group of those participating in many and varied projects and that of the non-participants;
- about proximity of the attitudes to transitional roles of teachers from both regions, who have a moderate participation in projects (up to 4 projects);
- about the difference of the attitudes towards traditional roles of teachers from both regions, who do not participate in projects.

The derived statistical conclusions are subject to qualitative analysis in the next part of the study. Table 2 shows the distribution of professional roles that teachers consider important.

Table 2: The most preferred professional roles of Teachers' respondents.

Professional Roles		participate in more than 4 projects				participate in up to 4 projects				do not participate in projects			
		Burgas		Vidin		Burgas		Vidin		Burgas		Vidin	
		F	%	F	%	F	%	F	%	F	%	F	%
traditional	educator	15	48,39	14	46,67	10	43,48	33	56,90	14	73,68	11	47,83
	role model	7	22,58	3	10,00	8	34,78	13	22,41	1	5,26	6	26,09
	expert	4	12,90	3	10,00	3	13,04	7	12,07	0	0,00	4	17,39
	examiner	1	3,23	4	13,33	0	0,00	7	12,07	1	5,26	2	8,70
	contractor	2	6,45	0	0,00	2	8,70	5	8,62	1	5,26	0	0,00
	planner	2	6,45	3	10,00	2	8,70	7	12,07	2	10,53	2	8,70
	informer	1	3,23	1	3,33	2	8,70	3	5,17	2	10,53	2	8,70
	observer	0	0,00	1	3,33	1	4,35	0	0,00	2	10,53	1	4,35
	preceptor	1	3,23	0	0,00	1	4,35	0	0,00	0	0,00	1	4,35
transitional	authority	11	35,48	15	50,00	13	56,52	40	68,97	11	57,89	15	65,22
	motivator	16	51,61	19	63,33	11	47,83	27	46,55	10	52,63	11	47,83
	creator	17	54,84	17	56,67	11	47,83	26	44,83	9	47,37	5	21,74
	manager	4	12,90	10	33,33	5	21,74	12	20,69	1	5,26	6	26,09
	organizer	9	29,03	6	20,00	4	17,39	9	15,52	4	21,05	2	8,70
	tutor	10	32,26	5	16,67	8	34,78	13	22,41	8	42,11	10	43,48
	initiator	6	19,35	10	33,33	3	13,04	5	8,62	1	5,26	3	13,04
	advisor	2	6,45	0	0,00	0	0,00	3	5,17	2	10,53	0	0,00
	consultant	1	3,23	2	6,67	1	4,35	5	8,62	0	0,00	1	4,35
	coordinator	4	12,90	4	13,33	0	0,00	7	12,07	0	0,00	2	8,70
	listener	4	12,90	2	6,67	2	8,70	5	8,62	2	10,53	5	21,74
	supporter	1	3,23	0	0,00	0	0,00	1	1,72	0	0,00	2	8,70
	supervisor	2	6,45	0	0,00	1	4,35	4	6,90	1	5,26	2	8,70
	distributor	0	0,00	1	3,33	0	0,00	1	1,72	0	0,00	0	0,00
current	innovator	19	61,29	19	63,33	14	60,87	32	55,17	10	52,63	8	34,78
	lieder	1	3,23	2	6,67	4	17,39	2	3,45	0	0,00	0	0,00
	mentor	1	3,23	3	10,00	2	8,70	5	8,62	2	10,53	1	4,35
	friend	8	25,81	4	13,33	1	4,35	12	20,69	8	42,11	5	21,74
	mediator	11	35,48	5	16,67	3	13,04	11	18,97	3	15,79	5	21,74
	selector of info	1	3,23	2	6,67	0	0,00	3	5,17	0	0,00	0	0,00
	collaborator	0	0,00	1	3,33	1	4,35	1	1,72	1	5,26	2	8,70
	moderator	0	0,00	0	0,00	2	8,70	1	1,72	0	0,00	0	0,00
	entrepreneur	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
	facilitator	0	0,00	1	3,33	0	0,00	1	1,72	0	0,00	1	4,35
	guardian	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
	opponent	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
	competitor	2	6,45	0	0,00	0	0,00	0	0,00	1	5,26	0	0,00
	network admin	1	3,23	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00
	animator	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00

Qualitative analysis fully confirms the first statistical trend. Three current roles stand out, building the profile of the teachers from the two regions who are involved in several projects, as follows:

- Innovator – indicated by the highest percent of the teachers from Vidin and Burgas, who participate in more than 4 projects (Table 2);
- Mediator – the second most frequently indicated role by the most active teachers in both regions (Table 2);
- Friend – the third most frequently indicated role by the most active teachers in both regions (Table 2).

The modern roles forming the profile of teachers who do not participate in projects are:

- Innovator – also indicated by the highest percent of the teachers from Vidin and Burgas who do not participate in projects (Table 2);

- Friend – the second most frequently indicated role by the non-active teachers in both regions (Table 2);
- Mediator – conditionally the third most frequently mentioned role of non-participants in projects, as in the sample of teachers from Vidin it is equal to the role of friend (Table 2).
-

The second statistical trend for convergence of attitudes towards transitional roles of teachers from both regions, who have a moderate participation in projects (up to 4 projects), is fully confirmed

- Authority – indicated respectively by 56,52% and 68,97% respondents (Table 2);
- Motivator – indicated respectively by 47,83% and 46,55% respondents (Table 2);
- Creator – indicated respectively by 47,83% and 44,83% respondents (Table 2).

The third statistical trend for different attitudes of teachers from both regions, who do not participate in projects, towards traditional roles, is confirmed.

Table 2 shows that the distribution of the statements of the respondents from the two regions is very different, although in these roles in both groups' priority is given to the role of educator (Table 2).

The derived results are a prerequisite to form empirically the status-role models of the respondent teachers. They are performed based on specified roles by over 50% of the participants in the respective group. The status-role model of teachers participating in more than 4 projects is presented in Table 3.

Table 3: Status-role Model of most active Teachers' respondents.

Burgas		Vidin	
Innovator	61,29%	Motivator	63,33%
Creator	54,84%	Innovator	63,33%
Motivator	51,61%	Creator	56.67%

From the data presented in Table 3 is seen the model of active teachers is stably presented with three roles typical of the modern teacher (Table 3). It is also noticeable that the teachers from Vidin recognize the role of authority - 50%. The presence of this role is an indicator of seeking support in the traditions in the implementation of the professional activity.

The status-role model of teachers participating in up to 4 projects is presented in Table 4.

Table 4: Status-role Model of moderately active Teachers' respondents.

Burgas		Vidin	
Innovator	60,87%	Authority	68,97%
Authority	56,52%	Educator	56,90%
		Innovator	55.17

As confirmed statistically, the models in this group are relative identical. The model of teachers from Burgas is poorer, but combines transitional and current roles, with the leading role of innovator (Table 4).

The model of the teachers from Vidin is richer, but contains the traditional role of educator, and the most significant is the role of authority (Table 4).

The status-role model of teachers participating in up to 4 projects is presented in Table 5.

Table 5: Status-role Model of nonactive Teachers' respondents.

Burgas		Vidin	
Educator	73,68%	Authority	65,22%
Authority	57,89%		
Motivator	52,63%		
Innovator	52,63%		

In the group of teachers who do not participate in projects in both regions, there are statistically similar roles to those of active parents. But these roles are expressed by less than 50% of the participants in the group of Vidin region. The role of authority is manifested in this group.

For the teachers from Burgas, although the leading role is the traditional role of teacher, there is still a model of 4 roles, in which the current role of innovator is present.

Conclusion

The study outlines several empirical patterns.

The principals of educational institutions in both regions provide additional opportunities for the development of the educational environment through project activities. In the Vidin region, the lack of care of the Municipality in support of education at the local level is obvious. This affects both the professional profile of teachers and the measures to attract and retain young teachers.

Teachers who participate in more project activities demonstrate a stable modern status-role profile. When municipal policies support the development of education through project activities, this profile tends to stabilize more and more seriously.

Teachers who do not participate in projects demonstrate a hesitant status-role profile. However, there is a tendency for teachers from Burgas, which is a region with a stable and innovative educational policy, to demonstrate a more stable and dynamic professional model than those in the Vidin region, which are focused mainly on the role of authorities.

The involvement of more teachers in project activities, especially in the specific for the region context, guarantees their professional development in the direction of updating and dynamizing the status-role models. That is one of the indicators for the quality of the educational service.

Although it can be indirectly argued that a stable regional policy in the field of education is a tool for attracting and retaining young and newly appointed teachers in the education system.

The study concludes that teachers who participate less or do not participate in project activities, especially in settlements where the municipality does not initiate such, are more likely to seek support in traditional roles than teachers who are actively working on projects and programs.

In conclusion, it should be said that this study is a pilot, and its main purpose is to outline trends that need to be studied more broadly and in depth.

Acknowledgements

This study is realized with the financial support of project NIH-436/2020 „Trends and perspectives in the development of status-role models and key competencies of Bulgarian teachers”

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Concept Mapping Strategy to Improve Non-computer Science Students' Learning Achievements in Logical Database Design

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
This study aims to investigate the effects of using concept mapping on student's performance on logical database modeling. One hundred and two undergraduate students participated in the study. These students were assigned into three groups with three different learning approaches: two experimental groups and one control group. The three learning approaches were compared to find out what effects they have on learning database modeling. The concept map was used as a first step of data modeling by the two experimental groups, while the control group was taught using the conventional approach without using the concept mapping strategy. We have studied the logical database schema made by all students during the achievement test to see if there was a significant difference between the student's scores of the three groups. The findings revealed that for novice students, using the concept map strategy in the database design may be more efficient than the conventional approach. It can help to enhance the academic performance of students in logical database modeling. Based on our observations and the students' statements, we can also consider that the concept map had a positive effect on the students' attitudes towards the content, increased the students' motivation, helped to induce a positive dynamic among them, a greater engagement and interest in the subject matter.

Keywords: Computer Science, Database, Database Design, Logical Database Design, Concept Map, Entity/Relationship Diagram, Relational Schema

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Introduction

Concept maps developed by Novak in 1972 are based on Ausubel's Assimilation theory (Ausubel, 1968) and Novak's Theory of Learning (Novak and Gowin 1984) which state that meaningful learning takes place when learners relate new knowledge to knowledge already acquired.

They are graphical tools used for organizing and representing knowledge. Concept maps include not only concepts but also relationships between them indicated by connecting arrow lines linking between two or more concepts and linking phrases that describe the relationship between concepts (Novak and *Cañas*, 2006).

Concept mapping can be a valuable learning tool used as an adjunct to other study methods, helping students organize and integrate information, gain new insights, relate new information to what they already know and detect areas where there are misunderstandings (Pintoi and Zeitz, 1997).

Concept maps have been used in a variety of teaching contexts and disciplines, including medicine (Daley et al., 2016), biology (Cathcart et al., 2010; Sakiyo and Waziri, 2015; Bergan-Roller et al., 2018), physics (Alias et al., 2006; Broggy and McClelland, 2009), chemistry (BouJaoude and Attieh, 2008; Mun et al., 2014; Ghani et al., 2017), mathematics (Oneca et al., 2006; Hafiz et al., 2017) and computer science (Gurupur et al., 2015; Santos et al., 2017; Omer et al., 2020).

In the context of computer science, concept mapping has been used in introducing computer course (Tokdemir and Cagiltay, 2010), in learning computer programming (Matthews, 2010; Jain et al., 2014; Dogan and Dikbiyik, 2016), in learning database concepts (Moen, 2009; Arruarte et al., 2014; Czenky and Kormos, 2014), in object-oriented modeling (Sien, & Carrington, 2007; Sien, 2011) and in conceptual database modeling (Gómez-Gauchía and McFadyen, 2011; Farza, 2018a; Farza, 2018b).

Nevertheless, students' performance in using concept map in the context of database design has rarely been assessed. Thus, this study aims to investigate the effects of using concept mapping on student's performance on logical data modeling.

The research question investigated in this study was as follow: what is the effect of using concept mapping on students' learning achievement in logical design of relational database schema?

Teaching Approach Adopted

The relational database design is an important topic in an introductory database course, and therefore it is most important that novices students understand it. Educators have a twofold challenge in teaching relational database design concepts: they need to deliver the theory of relational databases and also provide students with practical skills to perform effectively in real life (Al-Dmour, 2010).

Database design includes three design phases: conceptual design, logical design, and physical design. The result of the conceptual design is a conceptual schema (Entity-Relationship (ER) diagram or UML class diagram). The result of the logical design phase is a logical database

schema (relational database schema) which represents all information described by a conceptual schema produced during the conceptual design phase. The goal of the physical design is to implement the database.

In order to lead non-computer science students to develop the expected knowledge, it seemed relevant to us to propose the conceptual map as a tool that could deepen the understanding of the problem to be modeled and reduce the difficulties of transposing the description of the domain in natural language to the logical relational database schema.

Thus, to help novices' students to design a relational database schema, we envisaged only a two-step approach: a step of elaboration of the conceptual map and a step of transposition of this one towards a relational schema.

Principles of the Concept Map

The first step in designing a database is to create a concept map. Then the concept map is converted into a relational schema.

We extend previous work (Sien and Carrington 2007, McFadyen 2008, Farza 2018a, Farza 2018b) by adding mainly to the concept map the representation of the cardinality concept. This concept describes how the relation occurs between the main concepts. It is established by business rules.

The figure below represents the key-concepts of a conceptual map (Farza,2018a, 2018b):

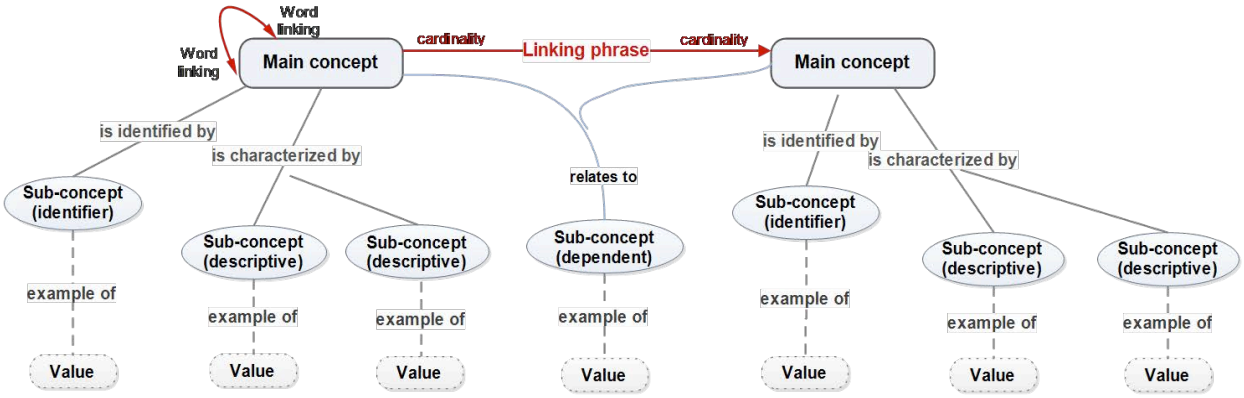

Figure 1: The Key-concepts of the Conceptual Map

- Several types of sub-concepts occur in the conceptual map: identifier sub-concept, descriptive sub-concept and dependent sub-concept.
- The main concept is described by descriptive sub-concepts and identifier sub-concept.
- The main concepts can be classified into a strong main concept and a weak main concept.

Concept	Description
Main concept	Represents a set of objects of the real world that have the same characteristics.
Instance	Specific example of the main concept.
Identifier sub-concept	Uniquely identifies each instance of the main concept.
Dependent sub-concept	Characteristic related to two main concepts.
Weak main concept	Main concept that depends on the existence of one or more other main concepts. This kind of concept can be identified uniquely only by considering the sub-concept identifier of another strong main concept.
Linking phrase	Represents the meaning of the link between - two main concepts (arrow line), - a main concept and itself (bidirectional arrow arc to and from the same main concept), - a main concept and a sub-concept (line), - a sub-concept and an instance (or value) of this sub-concept (dashed line).
Cardinality for a link	Specifies the number of instances of a main concept (minimum and maximum) associated with one instance of the related main concept. The minimum cardinality will be zero or one and the maximum cardinality will be one or many
Types of link	Links between main concepts can be - one-to-many (maximum cardinality one on one side and many on the other side), - one-to-one (both maximum cardinalities are one), - many-to-many (maximum cardinalities are many on both sides).

Table 1: Representation on Concept Map

Example of a Concept Map

The figure 2 shows an example of a conceptual map designed for a simple *personnel management* database for a company with several departments. Each department has at least one employee. An employee is assigned to only one department, but can work on one or more projects at different times. At least one employee is assigned to a project, but an employee may be not assigned to any projects. We keep track of the start date and the end date that an employee works on each project.

Each employee manages at most one department and each department is managed by only one employee.

Employees are supervised by a direct supervisor, who is himself an employee (an employee has at most one direct supervisor). Conversely, employees may or may not have subordinates. We want to keep track of the dependents of each employee. Each dependent (son and daughter) is dependent of only one employee. Dependents are identified by both employee number and the name of the dependent.

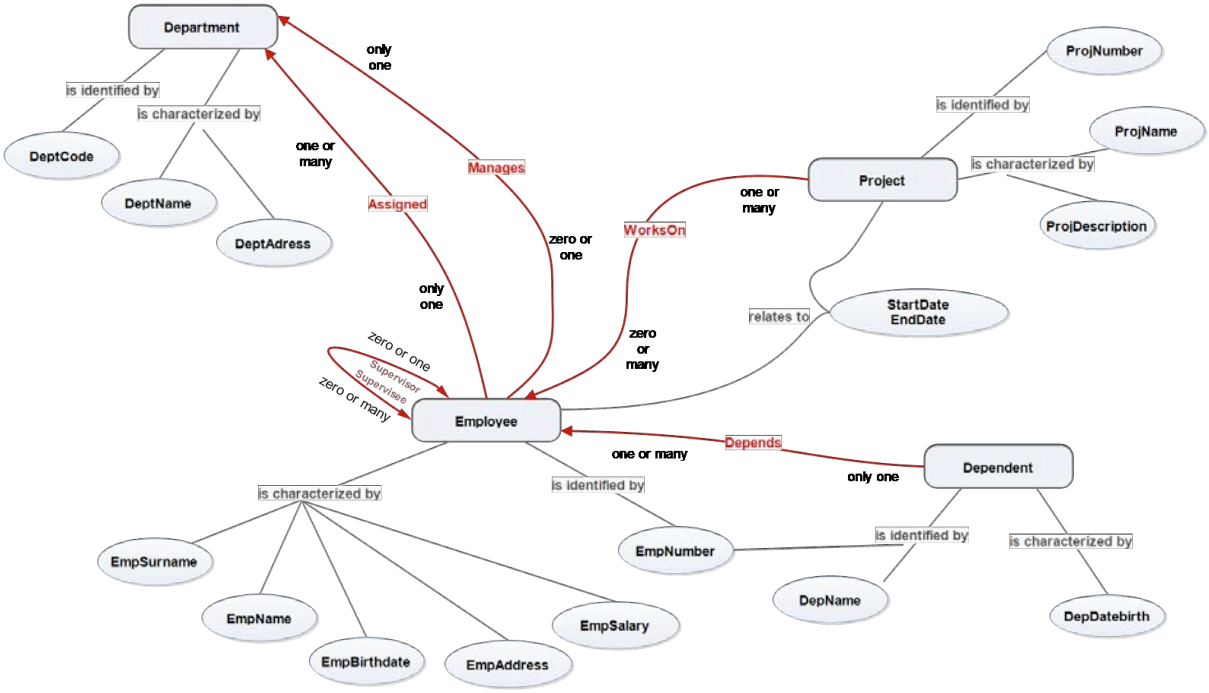

Figure 2: A Concept Map for a Personnel Management Scenario

Transformation of the Concept Map to a Relational Schema

The next step in the design process is to transform the concept map obtained to a relational database schema according to a set of translation rules. The aim is to construct a relational schema that represents all of the information described by the concept map.

The relational model is based on four main concepts: the relation, the attribute, the primary key and the foreign key.

Below the different steps required to transform the concept map to a relational schema.

- **Step 1: Mapping of Strong Main Concepts**

The concept map contains three strong main concepts: *Department*, *Employee* and *Project*.
Each strong main concept is transformed into a relation; its sub-concepts (identifier and descriptive) become attributes of the relation. The identifier sub-concept becomes the primary key of the relation and had to be underlined.

In our example, we generate three relations: *Department*, *Employee* and *Project*.

- **Step 2: Mapping of Weak Main Concepts**

The concept map contains one weak main concept: *Dependent*.
A weak main concept is also represented as relation. All the sub-concepts of the weak main concept form the attributes of the relation. The primary key of the relation is the combination of the primary key of the relation - which corresponds to the strong main concept – included as a foreign key and the partial identifier sub-concept of the weak main concept.

In our example, we include the primary key *EmpNumber* of the *Employee* relation as a foreign key attribute of the *Dependent* relation. The primary key of this relation is the combination (*EmpNumber, DepName*).

- **Step 3: Mapping Links Between Main Concepts**

One-to-many link:
A link one-to-many between main concepts is converted by including the primary key from the relation - which corresponds to the many-side main concept – as foreign key in the relation that represents the other one-side main concept.

In our example, we include the primary key *DeptCode* of the *Department* relation as foreign key in the *Employee* relation. We also include the primary key of the *Employee* relation as foreign key in the same relation because the link is recursive (link between a main concept and itself: from Employee to Employee) and calls it *EmpSupervisor*.

One-to-one link:
A link one-to-one between main concepts, with optional participation for one side main concept (cardinality: zero or one) and mandatory participation on the other one side (cardinality: only one), is converted by including the primary key from the relation - which corresponds to the main concept with optional participation – as foreign key in the relation that represents the main concept with mandatory participation.

In our example, we include the primary key of the *Employee* relation as foreign key in the *Department* relation and call it *EmpManager*.

Many-to-many link:
A link many-to-many between main concepts is converted by creating a new relation. The primary key of the two relations – that represents the two participating main concepts – are included as foreign key attributes in the new relation. Their combination will form the primary key. All sub-concepts related to the two main concepts become attributes of the new relation.

In our example, we create a relation *EmployeeWorks* in the relational database schema. The primary keys of the *Employee* and *Project* relations are included as foreign keys in *EmployeeWorks* relation. The primary key of this relation is the combination (*EmpNumber, ProjNumber*). Attributes *StartDate* and *EndDate* represent the other attributes of EmployeeWorks relation.

The figure below shows the relational schema which has been derived from the concept map (figure 2) by application of transformation rules.

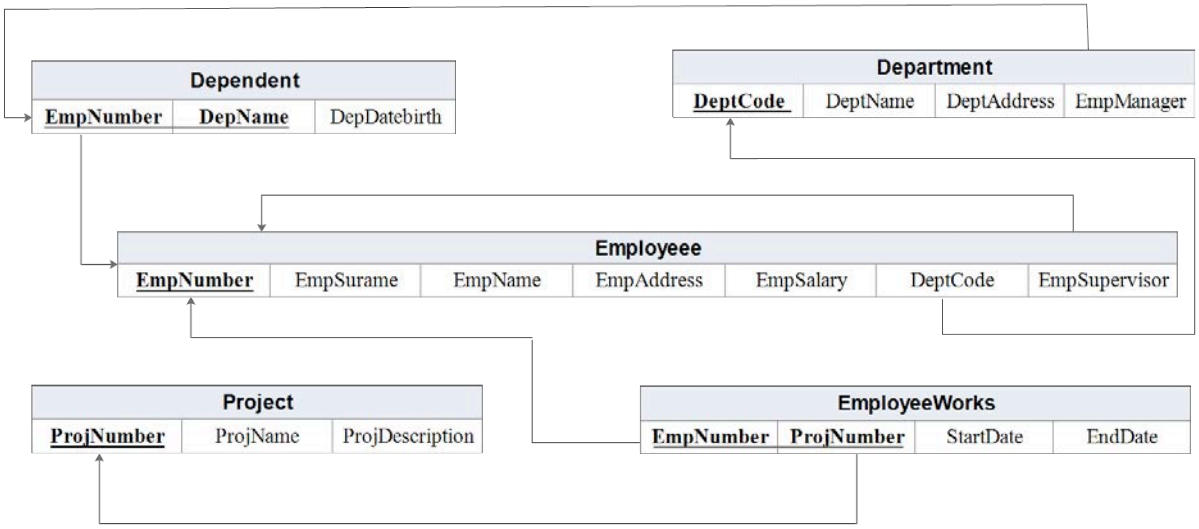

Figure 3: A Relational Database Schema for a Personnel Management Scenario

Below the textual representation of the relational schema:
Department(DeptCode, DeptName, DeptAddress, *EmpManager*)
Employee(EmpNumber, EmpSurame, EmpName, EmpAddress, EmpSalary, *DeptCode*, *EmpSupervisor*)
Project(ProjNumber, ProjName, ProjDescription)
EmployeeWorks(*EmpNumber, ProjNumber*, StartDate, EndDate)
Dependent(*EmpNumber, DepName*, DepDatebirth)

Material and Methods

Participants

The study was carried out over two academic years during which the students were taught a database design course.

The first study was conducted during the 2015/2016 academic year, to investigate the effect of utilizing concept mapping strategy as a first step in conceptual database design on the novice learner's performance in conceptual data modeling. This study (study 1) included two groups of non-computer science university undergraduate students: group 1 (experimental group with 22 students) was working with concept maps, while group 2 was not using the concept map (control group with 28 students). The results of this study suggest that, for novice learners, the concept map strategy in conceptual data modeling is more efficient than the traditional approach because it simplifies modeling tasks (Farza, 2018a, 2018b).

The present study was conducted during the 2017/2018 academic year, to compare the effect of using concept mapping strategy on the novice learner's performance in logical data modeling. The sample of the study consisted of one hundred and two non-computer science university undergraduate students randomly assigned into three groups: experimental group 1 (33 students), experimental group 2 (35 students) and a control group (34 students). All students were not familiar with database design and never heard about concept map.

While study 1 has investigated the effect of using concept map on student's performance in conceptual data modeling, the current study focuses on the effect of students' performance in logical data modeling.

Experimental Procedure

Students from three groups followed the same database design course with the same teacher and using the same teaching pedagogical approach combining learning from examples in problem-solving situations, collaborative learning and continuous formative assessment (Farza, 2015).

The main learning objectives of this course are to make students be able to understand fundamental relational database concepts and to be able to develop a database relational schema for specific database requirements.

Each group received 21 hours of instruction, 3 hours per week for 7 weeks. The only difference between groups was the used teaching approach in database design.

Three approaches (figure 3) were used, in this experiment, to teach data modeling: the conventional approach for the control group, the conceptual oriented approach for the first experimental group and the logical oriented approach for the second experimental group.

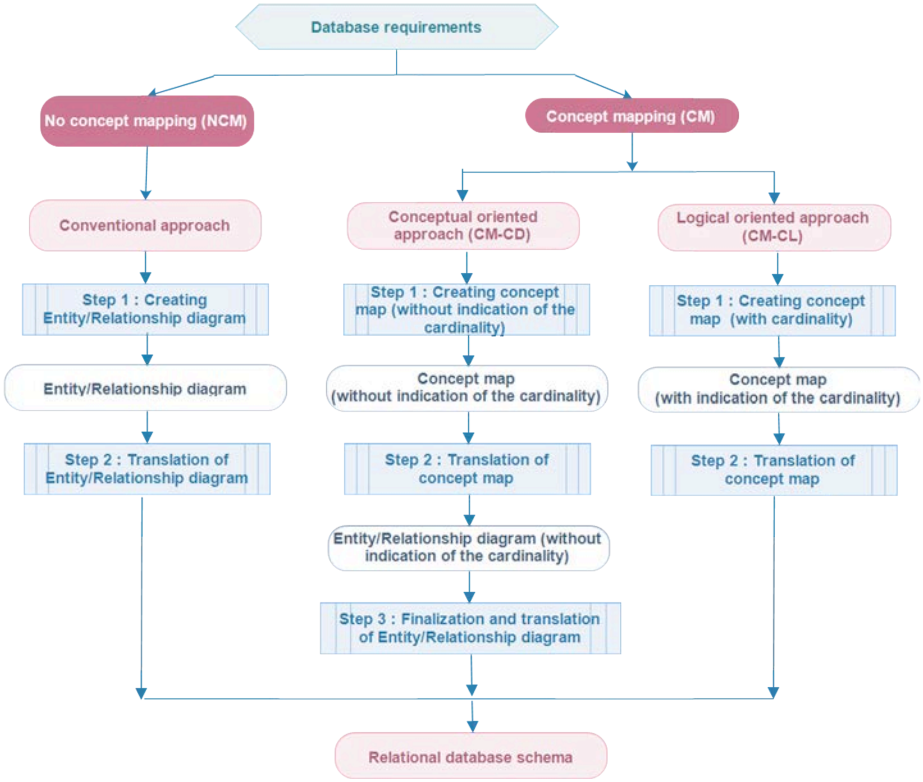

Figure 4: Teaching Approaches

The concept map was used as a first step of data modeling by the two experimental groups, while the control group was taught using the conventional method without using the concept mapping strategy.

- The conventional approach design, used with the control group (NCM), consisted of two steps: create an Entity-Relationship (ER) diagram (conceptual schema) responding to the database requirements and translate it to a relational schema (logical schema) by mapping the ER diagram to a relational schema using mapping rules.

- The conceptual oriented approach, used with the first experimental group (CM-CD), consisted of three steps: create the concept map responding to the database requirements, translate it to an ER diagram and create a relational schema by mapping ER diagram to relational schema using mapping rules.
- In the logical oriented approach, used with the second experimental group (CM-LD), only two steps were required to create a relational database schema: create the concept map responding to the database requirements and convert it to a relational schema by mapping the concept map obtained to the relational schema using mapping rules.

Many examples of solved database design problems using concept maps were given to the students of the two experimental groups.

The first example contains database requirements and a concept map responding to these requirements. After discussion with students of the example given, a second partially solved problem example containing the requirements of the database and a partially concept map was presented to students. They were asked to complete the concept map and translate it into a relational schema. In the last example, students were asked to construct a common concept map collaboratively (by groups of two or three students) and to give the relational database schema. A discussion was then conducted to allow students to show and discuss the concept map and the relational schema made.

Other exercises of increasing complexity, to be solved individually, were offered to the students to complete their learning. These required the construction of a concept map to produce a relational database schema.

Only the first experimental group had to elaborate the ER diagram before given the relational schema.

Instruments of Research

In this research a pre-test was conducted at the beginning of the course to evaluate students' computer science prior knowledge. At the end of the treatment, an identical post-test, of two hour periods, was administrated to the students in three groups, to determine the effectiveness of the concept mapping strategy on students' academic achievement in logical database design. They were asked to give a relational database schema that satisfies the given requirements. Only experimental groups had to produce before a concept map. The first experimental group had to translate the concept map into an ER diagram before giving the relational database schema.

The relational schemas made by students were scored out of seven.

Data Analysis Method

Data analysis was based on one independent variable: teaching modality (conventional approach, conceptual oriented approach, logical oriented approach). The dependent variable analyzed was the score in the problem solving post-test.

Descriptive statistics was used to analyze and determine the mean achievement scores for each group in logical database design. One-factor analysis of variance (ANOVA) was used to determine if there was a significant difference between groups.

Results and Discussion

We will present and analyze the results that we obtained following the statistical treatment.

A one way ANOVA showed that there was no significant difference between the pre-test scores of experimental groups and control group.

The research question was to investigate the effectiveness of the concept mapping versus the conventional approach on the logical data modeling teaching.

The following table shows the participants' mean scores and standard deviations on the post achievement tests:

Group	N	Mean	Standard deviation	Standard Error mean	95% Confidence Interval of the Difference	
					Lower	Upper
Control group (NCM)	34	4	1,174	0,201	3,795	4,615
Experimental group 1 (CM-CD)	33	5,121	1,494	0,262	4,591	5,651
Experimental group 2 (CM-LD)	35	5,028	1,543	0,260	4,498	5,558

Table 2: Descriptive Statistics for the Post-test

The results in Table 2 indicate that the mean scores on the post-test in the experimental group 1 (5.121) for the conceptual oriented approach and the experimental group 2 (5.028) for the logical oriented approach were higher than those of the control group (4). The experimental group 1 (M = 5.121, SD = 1.494) and the experimental group 2 (M = 5.028, SD = 1.543) performed almost the same on the post-test. The achievement of these two groups suggests that when students used the concept map as a first step either in the conceptual database modeling or in the logical database modeling, the results are better than teaching with the conventional design approach. However, the standard deviation is higher for the conceptual mapping approaches (conceptual oriented approach and logical oriented approach) than for the conventional approach.

To see if these differences are significant, a one-way ANOVA analysis of variance was used to observe whether there are differences attributed to the teaching approaches. The results of which are presented in Table 3.

Source of variation	Sum of Squares	df	Mean square	F	Level of Significance
Between groups	17,209	2	8,605	4,301	0,016
Within groups	198,045	99	2,000		
Total	215, 255	101			

Table 3: Results of ANOVA Analysis

As shown in Table 3, the ANOVA analysis revealed statistically significant difference between the post-test scores of the experimental and the control groups ($p = 0.016 < 0.05$). This means that the teaching approach has a major effect on students' learning performance.

In order to determine which of the three teaching approaches has a significant impact on learner performance, we applied a Tukey's HSD post-hoc test. Table 4 below shows the results obtained:

Group		Mean difference	95% Confidence Interval		p
I	**J**	**(I-J)**	**Lower Bound**	**Upper Bound**	
NCM	**CM-CD**	-0, 91533	-1, 7377	-0, 0929	**0, 025**
	CM-LD	-0, 82269	-1, 6331	-0, 0123	**0, 046**
CM-CD	**NCM**	0, 91533	0, 0929	1, 7377	**0, 025**
	CM-LD	0, 09264	-0, 7240	1, 9092	0, 961
CM-LD	**NCM**	0, 82269	0, 0123	1, 6331	**0, 046**
	CM-CD	-0, 09264	-0, 9092	0, 7240	0, 961

Table 4: Results of Tukey's HSD Post-hoc Test

This result allows us to refine the conclusion derived from the ANOVA test and to specify for which teaching approach significant differences in students' average scores are observed. Tukey post-hoc test (Table 4) revealed that the mean difference in scores between conventional approach (NCM) and conceptual oriented approach (CM-CD) was statistically significant ($p = 0.025 < 0.05$). The difference in mean scores between conventional approach (NCM) and conceptual logical approach (CM-LD) was statistically significant ($p = 0.046 < 0.05$). The Tukey test showed, therefore, a significant difference between groups in favor of the two experimental groups regarding the control group. In other words, the two groups who used the concept map in the database design process performed significantly better than the control group who used the conventional approach. However, the means scores between the two experimental groups (CM-CD and CM-LD) were not significantly different ($p = 0.961 > 0.05$).

This suggests that the use of concept mapping strategy as a first step of database design can improve the students' performance in the logical design of relational database schema, compared to the conventional approach without using concept mapping.

In conclusion, the results of study 1 (Farza, 2018a, 2018b) and the present study (study 2) reveal that the use of the concept map as the first step in database design can improve both novice students' performance in constructing the conceptual schema of a database (study 1) and in constructing the logical schema of a database (study 2).

Thus, the results of this study and the first one suggest that, for novice learners, the concept map strategy in data modeling is more effective than the conventional approach because it simplifies the modeling tasks, enables students to better understand the database requirements and to facilitate the learning process of database design.

Conclusion

In an introductory database course, database design is a fundamental topic that it is important to novice students will understand it correctly.

The present study investigates the impact on students' performance of using concept mapping strategy to support database design learning process. Three learning approaches were compared to find out what effects they have on learning: the conventional approach, the conceptual oriented approach and the logical oriented approach. The last two approaches use the concept map as a first step of database design.

The findings revealed that for novice non-computer science students, using the concept map strategy in the database design may be more efficient than the conventional approach. It can help to enhance the academic performance of students in logical database modeling. The concept map could be also helpful in the improvement of the understanding of a problem domain.

For future research, it will be important to detect and analyze logical modeling errors. The question to be formulated for this further research is how the use of a concept map could reduce errors produced by students when making relational database schema.

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Feedback Practices of School-Based Mentors in the Work Intergrated Learning Programme in South Africa

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Research has demonstrated that feedback is an essential facet of assessment in the learning environment because it enhances learning. However, little known about the feedback given to student teachers when they are on teaching practice and students' viewpoints about the role of feedback is not well understood as well. This study fills the gap by illuminating the feedback given to preservice teachers when they are on teaching practice. A qualitative content analysis approach was utilised to analyse three hundred and fifty journals. Alongside 10 students were interviewed to draw their perceptions and how they respond to feedback written in their journals. The researchers focused on written feedback which was written in student teachers' journals by mentor teachers. It was found out that feedback practices reflect mentors' personal belief systems and are constrained and influenced by their educational contexts. Some of the students interview responses reflected that the feedback they are given does not enhance learning. This then creates discrepancies, and such feedback interventions turn to disappoint. It is recommended that if feedback processes are to enhance learning, instructors should move beyond a view of feedback as transmission and acknowledge the impact feedback has on and the part students play in such processes. Instructors should give constructive feedback that enhance learning and develop deep disciplinary expertise. Feedback should be conceptualised as a developmentary dialogue that is positive and motivational.

Keywords: Feedback, School-Based Mentors, Work-Integrated Learning, Preservice Teachers, Content Analysis

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Introduction

Work Integrated Learning (WIL) programmes are designed to enable students to apply their academic learning to the workplace and adopt professional practices. Providing feedback to students is an important part of the work integrated learning programmes, as existing research points to the positive impact of feedback on students' development of work-based knowledge and skills (Richardson, et al., 2009). Research shows that effective feedback practices do not have to be teacher regulation but also student directed. Teacher feedback is input that, together with students' own internal input, will help the students decide where they are regarding the learning goals they need or want to meet and what they will tackle next (Bookhart, 2008, Hattie & Timpereley, 2007).

In the context of initial teacher education, assessment feedback during work integrated learning, is commonly provided by the school -based mentors or supervisors and can be both formative and summative as suggested by William and Black, (1998). The institutions do not necessarily provide prior training for these school-based mentors to assess student teachers, but assessment guidelines and rubrics are provided and often contained in the students' journals. Although this is the case, clear feedback guidelines are not often provided to these school-based mentors resulting in mentors giving ad hoc feedback to students (Rens et al., 2020).

Despite studies been conducted on feedback provided to students by lecturers in most programmes in the higher education, little is known about the feedback practices given to student teachers by school-based mentors when they are on work-integrated learning or teaching practice. Furthermore, student teachers' perspectives on the role of feedback is not well understood as well. This paper draws from the literature on formative assessment and best feedback practices to examine the feedback practices of school-based mentors in the work integrated learning programme of one university in South Africa.

What is Eeed Back?

As alluded by Henderson, et al., (2019), scholars are working to reposition and reimagine feedback as a student-centred process. They see feedback as a process in which student teachers make sense of information about their performance and use it to enhance the quality of their work or teaching competences. Drawing from the definition by Hattie and Timpereley (2007), conceptualize feedback as Information provided by an agent (e.g., school-based mentor) regarding aspects of one's performance or understanding. A teacher or parent can provide corrective information, a peer can provide an alternative strategy, a book can provide information to clarify ideas, a parent can provide encouragement, and a learner can look up the answer to evaluate the correctness of a response. Feedback thus is a "consequence" of performance (Hattie & Timperley, 2007). In the light of the statement above, feedback is seen as a main element of formative assessment and one of the factors that have the strongest influence on learning thus developmental in nature (Havnes, et al., 2012).

Efective Feedback Practices

Literature on assessment identified feedback as an integral part of formative assessment and that not all feedback provided to students enhance learning nor guides the student on the next steps to take (Shute,2007; Hattie &Timperely; 2007; William & Black, 1998). The value of providing useful feedback to students, and the appropriateness of the way in which this is

accomplished, is well documented in literature. This study draws from the good feedback practices as proposed by Nicol and MacFarlane-Dick (2006) to understand the feedback practices of school-based mentors in the work integrated learning.

Nicol and MacFarlane propose seven principles of good feedback practice to facilitate the development of student self-regulation and to aid in the active construction and acquisition of knowledge and skills by students. These scholars found that students can only achieve learning goals if they understand the goals, assume some ownership of them, and can assess progress. Nicol and Macfarlane-Dick (2006) describe the seven principles as being constitutive of good feedback.

Feedback is effective when it clarifies in unambiguous terms the goals, criteria, and expected standards in a learning context. This is essential to narrow the gap in understanding. Another approach that has proved particularly powerful in clarifying goals and assessment requirements has been to provide students with 'exemplars' of performance (Orsmond, Merry and Reiling, 2002). Exemplars are effective because they define an objective standard against which students can compare their work. In a work integrated learning context exemplars of what good performance is are commonly set by the institutions in accordance with requirements from the council of higher education and are made available in the teaching practice journals.

Good feedback practice facilitates the development of self-assessment and reflection in learning as suggested by Nicol and MacFarlane-Dick (2006). A key principle behind self-assessment and self-regulation is that students are involved both in identifying the standards or criteria that apply to their work and in monitoring and making judgements about how their work relates to these standards (Black &William, 1998). In the work integrated learning student teachers are expected to be able to engage in self-assessessment and critical reflection on their WIL experiences. Because of the complex nature of critical reflection, it cannot just be assumed that a student teacher will be able to critically reflect on his or her WIL experience. It is imperative that each student teacher has an expert mentor who directs him or her to an accepted level of self-reflection, using questions, comments, and suggestions to reach a meaningful level of critical reflection (Rens, et al., 2020, p:). Researchers in this study concur with other scholars that effective feedback from school-based mentors should enable student teachers to have the opportunity to augment their critical reflection ability while training and as Rens et al., (2020) suggest in a safe and supportive environment. While this is the case, sufficient knowledge of school-based mentors' feedback practices in relation to the above-mentioned principle and how student-teachers view the feedback given to them by mentors is needed.

The other principle involves the notion that good feedback encourages teacher and peer dialogue around learning. Good Feedback practice is conceptualised more as a dialogue rather than as information transmission. (Nicol & MacFarlane-Dick, 2006; Nicol & Milligan, 2006) Feedback as dialogue means that the student teacher not only receives initial feedback information but also can engage the school-based mentor in discussion about that feedback. Discussions with the school-based mentor assist student teachers to develop their understanding of expectations and standards, to check out and correct misunderstandings and to get an immediate response to difficulties. This principle guided the understanding of the school-based mentors' feedback practices.

Good feedback practice provides opportunities to close the gap between current and desired performance. Closing the gap is about supporting students through feedback that should be used by students to produce improved work, which might involve redoing the same assignment or providing opportunities for resubmission at specific moments of the feedback cycle. (Perrotta & Whitelock, 2017; Nicol & Milligan, 2006). Feedback by school-based mentors should support and help student teachers to recognize the next steps in their work integrated learning experiences and re-do or take action to improve their teaching competencies while they are learning.

Good feedback practice delivers high quality information to students about their learning, where quality can be interpreted as insight that focuses not only on pinpointing strengths and weaknesses in student work but also offering corrective, constructive advice for improvement that relates back to the goals of the assignment (Nicol & Milligan, 2006). Quality feedback is descriptive rather than evaluative; it provides information about the gap between current student performance (effect) and the goals, standards and criteria that define academic competence. Comments that provide non-specific advice such as praise/blame or exhortations (e.g., 'try harder') or unclear statements ('this essay is poorly structured') do (Nicol & Milligan, 2006). The researchers in this study are of the opinion that reimagining and re-thinking work integrated learning in terms of the seven principles of good feedback practice help develop self-regulation. Descriptive information about performance in relation to stated assessment criteria is more effective and more likely to be acted upon by students' teachers.

Richardson et al. (2009) describe the role of the work-based mentor or supervisor as educational and supportive in developing the students by teaching knowledge and skills and assisting the students to transfer their theoretical knowledge to practice. This supportive function involves encouraging the student in their development of self-confidence as a professional and more broadly work awareness towards the establishment of a reflective practice.

Good feedback practice in this instance, should also encourages positive motivational beliefs and self-esteem. The principle mentioned by Nicol and MacFarlane-Dick, which suggests making multiple low-stakes assignments that are intended to generate feedback for the purposes of helping students gauge progress and achievement rather than to focus on grades as indicators of success or failure. Compared to the academic environment where performance is quantified by grades, performance in the workplace is often unclear, intangible, and based on the perception of others. This requires student teachers in the workplace to be patient because it is impossible for them to know everything about the school from the outset. Hence students-teachers need to adopt learning styles that quickly build their confidence (Martin & Hughes, 2009) School-based mentors can help this process by providing support, encouragement, reinforcement, guidance, positive criticism, and feedback.

Finally, and consistent with with the aims of assessment in higher education, good feedback practice should also provide useful information for lecturers that can be used to improve subsequent activities and courses.

Aims of the Research

The focus of this paper is on examining the feedback practices of school-based mentors in the work integrated learning programme of one university in South Africa. The study addressed the following questions:

- *What are school-based mentors' feedback practices?*
- *How do student-teachers view the feedback given to them by mentors?*

In this research paper the principles discussed in the preceding paragraphs assisted in finding out what type of feedback was given to student teachers when they are on teaching practice. Feedback given to student teachers is important because such feedback shows if there are points of progression and areas which needs improvement (Perrotta & Whitelock 2017).

Methodology

The study adopted a qualitative research approach which is rooted in the interpretative paradigm Creswell and Creswell 2018). Qualitative approach was chosen to provide specific understanding of feedback given to preservice teachers by mentor teachers. Qualitative approaches are for the most part, intended to achieve depth of understanding of the phenomenon under investigation. This is the reason why qualitative research method appeared to be the most appropriate method for this research because the researchers were after an in-depth understanding of feedback to preservice student teachers by mentor teachers. The importance of feedback also stimulated researchers to sort for deeper analysis of the feedback given to preservice teachers when they are on teaching practice.

Feedback is one of the major factors of learning and teaching process and is recognised as a core component of the learning process, so depth of understanding is needed. In support Chernikova et al (2020 p.1) are of the view that "feedback functions as an instructional scaffold that can enhance reflection, consequently fostering student teachers' professional competence". Nicol and MacFarlane-Dick (2006) provided variable principles of feedback practices which we thought can assist in unlashing the type of feedback given to preservice teachers by mentor teachers. The seven principles are highly esteemed for cultivating students' ability to self-regulate their own performance (Perrotta & Whitelock 2017).

Population and Sampling

In research population does not refer to people only, it also refers to total quantity of the things or cases which are the subject of research (Etikan, Musa, & Alkassim, (2016). For this research population refers to 350 preservice teachers' journals of third year students who were in a BEd programme. Researchers focused on written feedback which was written in student teachers' journals by mentor teachers.

Convenience sampling was employed to analyse 30 journals because researchers were faced with quite many journals. Most researchers agree on the fact that convenient is useful especially when randomization is impossible like when the population is very large (Etikan, Musa, & Alkassim, (2016 p 1). Furthermore, convenience sampling techniques stresses a lot on the importance of generalisation making sure the data gathered adequately represent the population the sample is drawn from. In cases where it is impossible to collect data from everyone in the population it is necessary to employ convenient sampling when the research is qualitative in nature. However, it is the nature of research that gives researchers direction in terms of the type of sampling to adopt. Thirty journals were therefore, sampled for data collection. These thirty journals (30) were easily accessible to the researchers because one of the researchers was teaching the students. In support some scholars are of the opinion that convenience sampling is affordable, easy and the subjects are readily available (Etikan, Musa & Alkassim, (2016). Alongside 10 students were interviewed to draw their perceptions and

how they respond to feedback written in their journals. Semi-structured interview questions were asked to 10 students. This type of interview was more appropriate to compliment content analysis–because it addressed the areas of which were not captured by the written feedback.

Ethical clearance and permission to conduct the study was obtained from the Research Ethics Committee (REC) from the University. The participants were informed about the study and the relevant information such as the title, purpose of the study and the objectives. The participants were provided with the consent forms that they had to sign. The anonymity of the participants was kept private and confidential (Creswell and Guetterman 2019). The participants were informed that their participation was voluntary, and they can withdraw from participating at any given time. The data gathering process was carried out in line with the Government COVID-19 regulations and guidelines.

Results and Discussion

It was found out that feedback practices reflect mentors' personal belief systems and are constrained and influenced by their educational contexts. The educational contexts of these school-based mentors are still clinging to the traditional way of teaching and assessment which is teacher centred not learner focussed. The feedback practice of school-based mentors seemed to revolve around principle 6 which emphasise feedback that encourages positive motivational beliefs and self-esteem. Although the feedback given by mentors is motivational, it is not specific nor descriptive enough. It is not linked to the learning that is expected and highlights key issue like faulty interpretations and lack of understanding. The feedback does not also direct students-teachers of the next steps to take to the improvement of their teaching competencies. This happens even though the exemplars of what 'good work looks like, which embraces principle1, are provided in the teaching practice journals as per the institution requirements.

The analysed journals and interviews data do not say anything about principle 1 to 5 and 7. Accordingly all principles should be the focus because feedback should be geared towards an on-going improvement of teaching skills as student -teachers learn to enact the pedagogical theories into practice in an authentic environment/ real classroom environment during work integrated learning season.

Good feedback should give students the opportunity to develop their ability to self-assess and self-correct. In support Dawson, Carless & Lee (2021) argue that 'authentic feedback should have processes that resemble the feedback practices of the discipline, profession or workplace. The comments in the analysed journals did not also develop reflection which involves metacognitive reasoning (Rens et al., 2020). Apart from that, there was no room in the comments of the mentors to facilitate peer assessment which often involves giving of feedback. This is contrary to Strijbos and Sluijsmans (2010), who believe that peers are legitimate providers of feedback. Mentor feedback and peer feedback assist students monitoring their learning, utilising their own and external feedback about their progress (Harris, Brown, & Harnett, 2014). Principle number 2 as outlined in the above findings was not adequately addressed by the school-based mentors.

Interview data revealed that principle number 3 which involves the notion that good feedback encourages teacher and peer dialogue around learning was lacking in the school-based mentors feedback practices. Most feedback given was written and did not allow student-

teachers opportunity to engage the mentors in discussion about it. Even peers were not accommodated in this feedback contrary to what good feedback model as proposed by Nicol and Mac Farlane-Dick (2006). Hence the feedback was more transmissive than developmental.

The analysed data and interview results also showed that feedback given by school-based mentors did not provide opportunities to close the gap between current and desired performance. Written feedback on the analysed journals were not explicit enough in guiding the next steps student should take after lesson presentation. Interview data also revealed that student-teachers did not have an opportunity to re-do the lesson which or re-focus their lesson on the aspects the mentor has identified as lacking. This contrary to principle number 4 as outlined by Nicol & Macfarlane-Dick, 2006) which is about good feed-back practice being about closing the gap between current and desired performance.

The results showed that mentors feedback practices did not embrace principle number 5 which states that good feedback should give students high quality information to about their learning. The feedback given seem to be lacking as no constructive advice for improvement that relates back to the goals or criteria outlined in the teaching practice journal (Nicol & Milligan, 2006). Feedback given is evaluative not descriptive and provides no information about the gap between current student performance (effect) and the goals, standards and criteria that define academic competence Comments given did not provide student teachers with specific advice to improve their competencies in teaching and planning of the lesson.

As researchers in this study, we also reflected on the feedback given by mentors and found it to be lacking in informing us about the extent to which our students have developed expertise so that we can adapt our teaching accordingly. Hence the last principle which involves the notion that good feedback provides information to teacher-educators that can be used to help shape their teaching was missing in the feedback practices of these mentors.

In addition to the how mentor feedback is experienced by the student-teachers, some interviewed students articulated that they support peer feedback but most of the students were alone in the schools they were practising. To them receiving feedback from peers is motivating and encouraging since they have the same experiences. Though there is this controversy that "students seem to like receiving multiple forms of feedback and may prefer teacher feedback to that generated by themselves or peers due to concerns about accuracy" (Harris, Brown, & Harnett, 2014, p. 111). Feedback should be centred around professional development and to monitor learning progressions. There is the notion that feedback contributes to growth in learning and teaching and that the expertise of a mentor as a legitimate source of good and authentic feedback. Feedback should, therefore, focus on improving learning rather than mask it (Brown et al. 2012).

The results on feedback practices above, raise concerns regarding how assessment in the work integrated learning programme of the initial teacher education programmes is handled. As alluded in the introduction of this paper, assessment in the work integrated learning can be both formative and summative. Formative assessment which involves both mentor and peer-feedback seem not practiced at all by mentors in schools. The feedback assessment that is commonly provided is summative which involves feedback that is centred on the mark or grade. This feedback is often evaluative and does not improve student knowledge and skills (Black &William, 1998).

Implications

The implication is that the institutions need to re-imagine formative assessment which involves both mentor and peer feedback as a core of its practice in the work integrated learning programme. Seven principles as outline in the preceding sections need to be used as theoretical model for this. The teaching practice journal and related assessment tools and activities need and to be revised to align with the formative assessment based on the model.

Conclusion

to support the delivery of teacher and peer feedback even though more research is required to This research adds to the body of knowledge on school-based mentor feedback in the work integrated learning. This study also adds to our understanding of what feedback school-based mentors give and how student teachers experience and understand feedback. The conclusion is that mentor feedback needs to be aligned to the seven principles. Good feedback should be a vehicle to enhance student-teachers' knowledge and skills of their practice.

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Education and Training for Social Change: Analyzing a Social Welfare Model for Grassroots Development in Bangladesh

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
The shortage of skilled workers is the major barrier to economic prosperity in Bangladesh. A third of its population falls between 10-24 years old but the youth forces are not well-trained with technical education and social knowledge. The present study shows how philanthropic endeavors can contribute to improving the vulnerable conditions of the rural population by providing social services, training, and skill development programs in a developing nation. Recent research findings show that private philanthropy plays a key role in financing education in developing countries. According to OCED reports (2019, 2020, and 2021), domestic foundations supported the education sector above all other sectors while the giving capacity of private foundations is endangered by the recent global economic crisis. Amidst the economic vulnerability and pandemic, a domestic private philanthropic organization namely SIMEC foundation continued its support for the ongoing training and social development projects. The present study examines the social welfare mechanism by private and domestic philanthropy in Bangladesh and the disruption during COVID 19 pandemic. It indicates how such endeavors can be effective in the implementation of SDGs in Bangladesh. The study has been conducted following a mixed method. For the data collection survey, FGD and interviews were conducted among 300 recipients of the skill development training and educational support by the foundation. Research findings indicate an effective contribution of the initiative to the individual and social development of the respondents.

Keywords: Domestic Private Philanthropy, Social Welfare, Social Change, Sustainable Development Goals (SDGs), Skill Development, Grassroots Development, Bangladesh

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Introduction

Bangladesh has passed its 50 years of Independence in 2021. The country has celebrated its golden jubilee of liberation with jubilant festivities, as it leaped ahead of social and economic backwardness in recent decades. Despite all its socio-economic advancement over the years, the country is still struggling to cope with the rapidly changing globalization at a good pace like many other countries. The over-population with unskilled youths continued to disrupt the country's growth and socio-economic development.

In spite of employing comprehensive efforts, it is never sufficient for the government alone to bring social change and ensure social development in a nation holistically. In order to tackle the challenges of the new millennium, the government of Bangladesh paid significant attention to digitalization, skill development, and outcome-based education. In recent years, along with new policies, various governmental bodies took initiatives for making Bangladesh digital, providing skill development training to reduce unemployment. Given the void and need, the country is trying its best in different ways to bring socio-economic wellbeing, where youths are taken as flag bearers. Youths are considered as the key force of socio-economic change of a nation; in the case of Bangladesh it is very obvious where UNFPA says, young people aged between 10-24 years make up 27.5% of the total population in Bangladesh (UNFPA, 2021). Education and training of the youths for a better contribution to society, has been one of the top most priorities of the government of Bangladesh in recent years to accomplish the SDG goals and to facilitate the fourth industrial revolution in the coming days. Along with the government, a very few organizations from home and abroad have come forward to contribute to this initiative till now. There is a huge gap between the 'need and supply' of the demand in society in terms of vocational training and skill-based education.

Bangladesh has multifaceted challenges for ensuring grassroots development. Grassroots innovation, developing human capital in the margins, increasing income-generating capability at the bottom of the pyramid, and creating employment for youths in rural Bangladesh are some of the prime concerns. International donor agencies tried to play a partnering role along with some local NGOs. Sad but true, there has not been much attention paid to examine the role of local philanthropic organizations and community activities for social development in Bangladesh.

Philanthropic foundations across the world are playing a growing role in alleviating human suffering, promoting social justice and fair economic growth, and also developing and supporting a wide range of civil society objectives and activities. In recent years, philanthropy is on the rise globally. According to a study on "private philanthropy for development" by OECD (Organization for Economic Co-operation and Development) Centre on Philanthropy 2018, "Philanthropists favor investing in stable, middle-income countries" and "Philanthropic foundations based in developing countries operate to a large extent domestically". But in the case of Bangladesh, there is a lack of research and data regarding the role and contribution of domestic philanthropic organizations. In order to examine the role of private domestic philanthropic organizations we have studied one case, a social welfare model for grassroots development. The study shows that such initiatives can help to pull out a good number of people from poverty and social misery. The following discussion of the paper will shed some light and analyze the issues in the aspects of education and training for social change and welfare focusing on rural Bangladesh.

Philanthropy for Education: A review of literature

Before we provide the detailed findings of the case in hand, it is imperative to reflect on some of these initiatives for socio-economic development in rural Bangladesh. This may help us to get familiar with the present context and flag the gaps where philanthropic initiatives can intervene to make socio-economic progress at the grassroots level of the country.

The skill-based professional education and training have not been popular in the newly independent countries in Asia till 1970s, especially in the South Asian countries that had been struggling for economic progress. The demand for skilled labor-force has been increased multiple times by the last two decades of the 20th century when the countries started to export labor-force to overseas, i.e. Middle-East and East Asian countries. The growing demand for a professional skilled workforce has led the governments to come up with policies and facilitate the Vocational Education and Training program at a larger scale at the institutional levels. To develop the technical and vocational education system, *the Directorate of Technical Education* was established in 1960 in Bangladesh (then East Pakistan), which came into force to supervise, regulate and facilitate technical education in 1969 under the Bangladesh Technical Education Board (BTEB) (Agrawal, 2013).

The philanthropic activities for socio-economic developments are mainly classified as religious philanthropy and corporate philanthropy. Corporate philanthropy gained popularity in recent years, particularly in the last decades in Bangladesh, but unable to meet the necessities in the grassroots. Important to note that the banks are the only organizations that adhere to the CSR guidelines and through the channel of Bangladesh Bank one can access the data of banking sector philanthropic contributions. There are a handful of business organizations and corporate groups that participate in a sustained manner to support rural populations for development. Multinational Companies are more active and have performed well in providing support to the marginalized section of the society through CSR (Alam et al. (2010).

Religious philanthropy has a long-standing role in the context of Bangladesh. For example, Karim and Murad (2018) studied the Waqf (The Islamic endowment system of property to be held in trust and used for a philanthropic, charitable, or religious purpose) in Bangladesh. As the country is mostly Muslim-populated, the Waqf system is an important part of the social contribution of philanthropic activities. However, as the authors have highlighted that other religious people bestow their property to the common philanthropic activities like school establishment, digging ponds for water resources, but the Muslim Waqf system is still going to the religious purpose in most of the cases. When it comes to the charity, we see the Zakat system, (a mandatory philanthropic rule for affluent people who own a certain amount of wealth) plays a crucial role to support the poor communities. Nabi et al. (2021) argue that proper estimation, distribution, and management of *Zakat* can alleviate poverty. But it is important to note that the Zakat system is a pure charity activity that can barely play a role in growth and development. Needless to say that the culture of charity and social philanthropy has a long history in Bangladesh as well as in South Asia, but how this support can add to the development of society with sustainable economic growth remains a matter of critical inquiry.

Islam (2016) has studied the emergence and contribution of the NGOs in Bangladesh and in the light of contemporary debate of their social service Vs social exploitation by their micro-finance and commercial activities. Making a profit in the name of social contribution is a

long-term conundrum in the socio-economic aspects of the grassroots level in Bangladesh. The paper argued that the NOGs had a positive contribution to the economic progress and poverty alleviation in rural Bangladesh though there are lots of debates and complexities around it.

Anthropologist Filippo Osella (2018) has given an overview of the charity and philanthropic activities in South Asia. Where he identified the practice of philanthropic activities in South Asia is common and the countries in the region are in a good position of 'World Giving Index-2014' on charitable and philanthropic activities. He mentioned that India, Pakistan, and Bangladesh are in the list of top 10 countries for philanthropic activities towards society. And all the South Asian countries are in the top 75 of the list of 135 countries surveyed. The culture of social philanthropy is deeply rooted and historical in South Asia where people feel sharing is a virtue in the aspects of all major religions practiced across the region.

The government of Bangladesh has prepared the National Sustainable Development Strategy 2010-21 (NSDS) to address a critical development aspiration that includes *Sustained Economic Growth* as one of the strategies. It is expected that the implementation of different strategies under sustained economic growth will ensure sustained accelerated growth. It will also facilitate poverty reduction through employment generation. The policy paid due attention to the youth labor-force (aged between 15-29) which comprises 37 percent of the total labor-force. The unemployment rate of youth labor is 7.5 percent which is 3 percentage points higher than the national rate. Hence the government encourages skill development, vocational training, and motivation programs for the youth to generate self-employment and wage employment for youth.

Newaz et al. (2013) have tried to find out the constraints of the vocational education and training in Bangladesh, where they focused on the criteria of a knowledge-based economy, struggle for social inequality, awareness of the highly qualified vocational framework from the institutional level to make the skilled-based professional education system successful in a country like Bangladesh. They argued that, in Bangladesh, the initiatives and infrastructure are good enough, but "poor formulation and implementation of strategies" are the key drawbacks of flourishing professionalism in the skilled-based education system in the country.

The above literature has given an overview on the nature and practice of philanthropic activities in the society largely in Bangladesh as a specific and South Asia in a common discussion. Most of the charity and humanitarian activities are related to financial assistance to needy people. There is very little practice of philanthropic activities, especially in Bangladesh where NOGs, CSR of MNCs, Charitable Trusts, Humanitarian organizations are promoting the skill development of the marginalized portion of the social community to pull them out from poverty and make a sustainable solution for their economic misery.

Education and Skill Development for Positive Social Change

Accompanying the government's initiatives to educate and train the youths to be skilled enough, some NGOs from home and abroad are working to increase the professional capabilities of the youths in different sectors of work. Multinational companies are also coming forward with CSR programs for social wellbeing in different aspects i.e. education, health, environment, humanitarian assistance in natural calamities, and so on. Philanthropic activities by individuals, groups, different foundations, and organizations along with social

workers and others' initiatives are playing important roles to pull out a good number of people from poverty and social misery in Bangladesh.

Education has always been a key component of the socio-economic changes of a nation. In a populous country like Bangladesh, Vocational Education and skill-based training are essential for economic progress. Professional training can transform the population into a workforce that can contribute to the economy. Bangladesh is struggling to move forward in socio-economic aspects since its independence, and in recent decades it has brought some significant changes when the youths started to come up with their skillful labor and professional efficacy. The scenario in urban, peri-urban, and rural areas has changed a lot in the last three decades, after vocational education and training have been spread all over the country, especially in rural Bangladesh (Islam & Mia, 2007).

Vocational education and training have a significant contribution to the socio-economic development of Bangladesh. In rural Bangladesh, where students from poor and marginalized communities cannot afford to go for general education, they prefer vocational education with a low cost for quality skill development. Like many other developing countries, Bangladesh could not ensure 100% quality education for all, in spite of Education being one of the basic human rights. So, this education system is contributing to prevent the dropout of students from secondary and higher secondary education in the country. In the aspects of the production of skilled manpower, vocational education and training are playing a significant role in human development in the remote areas of Bangladesh for the last four-five decades (Alam, G. M, 2008).

Vocational education and training provide employment opportunities to persons with disabilities. These people in rural Bangladesh are full of misery in their individual life where most of the family considers them as 'burden' unless they can financially contribute. The skilled-based education system helps them to come out from the physical inability to overcome the financial distress and empower them in social aspects. Nuri et al. (2012) have studied the impact of the vocational training program for persons with disabilities in Bangladesh, where they have deduced with field data that after vocational education and training more than 74% have improved their life and livelihood with a better social acceptance.

Overall, for the holistic development of society, everyone should be taken on board and the approach should be reached to the outreach people. In Bangladesh, vocational education and training are contributing to human development by providing skilled-based education among rural communities.

Social Welfare Model for Positive Change: A Case of SIMEC Foundation

We have conducted qualitative fieldwork followed by a baseline survey focusing on a particular social development initiative by SIMEC Foundation to examine how such efforts contribute in grassroots development. The subsequent discussion will reflect on the issues in elaborative ways.

With the motto of helping the poor and improving the life and livelihood of rural Bangladesh, SIMEC Foundation was established by the chairman of SIMEC group Eng. Sardar Md Shaheen. Imperative to note that the main slogan of the SIMEC group resonates with the activities foundation undertakes, which is 'Improve the Possibilities'. The foundation in

nature is domestic and private that is mainly funded by a business group called SIMEC group. It is run by its dedicated members and volunteers who are keen to help society and believe that they have responsibilities towards society.

SIMEC Foundation works on various areas to improve the rural society including awareness building, training, counseling, and health services. We have studied three major programs to understand the subject matter of this paper, which are: *Sahiya Majid Scholarship program*, *Afsana Khanom Sewing Training Program,* and *Abul Kalam Mondol Computer Training Project*. These programs are being conducted in the rural location namely *Dhala*, located in *Balipara Union Parishad* of *Trishal* Upazila that falls under Mymensingh district in Bangladesh. We can see the outcomes of the projects and the implications of these projects in rural development briefly.

Annually around 200 students at the level of primary, lower and higher secondary from 25 schools and colleges are beneficiaries of the *Sahiya Majid Scholarship Program*. The scholarship has been distributed to the students of grades 5, 8, 10, and 12th. Providing scholarships to the poor but meritorious school students has contributed to reducing the causes of dropout in the locality. In terms of financial benefit, the amount is not sufficient to cover the educational and livelihood costs of a student. But the amount contributes to buying their educational materials. Moreover, the students get an edge in convincing their parents, so that they are not been asked to leave the school. Here, it is important to mention that the dropout rate remained around 30 percent and economic hardship is the major reason behind the dropouts. Grade 5, 8 and lower secondary has higher dropout rates as per the UNICEF country report on education. The out-of-school rate in the primary, lower secondary, and higher secondary is quite high in Mymensingh division. Which is in percentage 14 at primary, 23 at lower secondary, and 36 at higher secondary (UNICEF, 2021). More importantly, the scholarship has significantly contributed to reducing the cases of child marriage in *Balipara*. Many school-going girls capitalized on the fact that they are scholarship recipients and continued their studies while facing the social or family pressure to get married at an early age.

Abul Kalam Mondol Computer Training Project started in the year 2015 and so far it has trained around 1400 young both male and female. Since the program was initiated, the youth population including the post-secondary students got attracted to this skill development training and computer certificate course. The course is composed of basic MS word, Excel, Web page browsing and multimedia basic learning with hands-on training and tutorial. Initially, the young boys took the opportunity to access the free training, and eventually, the girls became more interested to join this skill development program. The computer training program is not only supported the young groups to get jobs at home and abroad, but also contributed to building confidence among the students who joined higher education. A selected section of the recipients of the training also became entrepreneurs as they had set up a computer-based business and digital solution centers in remote locations of the locality.

Jannatun Nayem, a 27 years old residence of *Balipara* who set up his business after taking training from SIMEC foundation's computer training and skill development program. According to him, the training made him confident in taking an initiative of his own in the local set-up. He got motivated to become an entrepreneur by opening a small computer shop in the local market of *Dhala*. Within a year time, the shop turned profitable since he started getting customers who come for purposes of computer compose, photocopying, making bio-data, filling up various forms online, and downloading official documents. *Nayem* was a

student of the first batch of SIMEC's free computer training. Some of his batch-mates have joined as service holders in government offices as well as educational institutes as computer teachers or operators. While he acknowledges their success but does not carries any regrets for his business. He is kind of a role model for many youths who have gained computer skills. Following his success, there are other candidates who set up a small business of digital centers in the remote localities, known as *chars,* of *Balipara*. *Chars* are floodplain sediment islands across the river and often the inhabitants of such islands are disconnected from modern facilities including electricity and easy communication. A small center in such a location that can provide internet facilities with computers has contributed significantly to the lives of farmers and students. Villagers have identified and assessed the socio-economic benefit of the skill development program and encouraged their kin to pursue computer training. *Mawlana Md. Abdul Gaffar (57)* stated that he motivated and sent his daughter for this computer training course even though it is a co-education while from a personal belief he is against the institutional set-up where boys and girls study together.

Finally, we will reflect on the Sewing training project for rural women. Under this project around 500 unprivileged and under-privileged women got skill development training from 2017 to 2021. After receiving the training almost 50 percent of them have bought their personal sewing machine and started a business at home. Those who could not manage a sewing machine arranged to use the neighbors' or relatives' machine to provide customer services in sewing clothes. Women who did not have any source of income earlier gained the confidence to earn from 100 to 200 USD monthly from their business. A section of the respondents stated that they gained motivation to open a tailoring shop in the local market. Despite the fact that there are various forces against women's entrepreneurship in rural society, the women trained under this project got motivation and confidence to launch their own businesses. One respondent named *Rahima Khatun (45)* said it is almost impossible that the women would think of opening a business shop in the rural market due to the social norm and values in their locality. Therefore, she began the practice at home as well as taking orders from customers from neighbors and other villagers. She started getting a good amount of orders and earned sufficient money to run the family constitute of five members. Since her husband returned from the capital city during the pandemic and still struggling to find work, who was only earning member before, the family is fully dependent on her earnings. As a consequence, her husband granted permission to set up a tailoring shop in the local market. This case may be considered as an example of some qualitative and positive development towards social change in rural Bangladesh.

We can have a quantitative overview of the findings from the field where the survey data show,

➢ The majority of the beneficiaries of the skill development training programs fall between the age group of 16 to 21.

 Almost all the respondents recommended others to take part in the training for skill development.

 In the computer training program, more than 45 percent of the participants benefited in the job sector, while the rest credited the training for making their educational and daily digital life smooth.

A majority of the respondents recommended for upgradation of the computer training program further, which should include: Graphics Design, Digital Marketing, and other creative skills development courses that may benefit the learners for freelancing in the online

platforms. Almost all the respondents under current scholarship programs have demanded for an increase in the amount in the coming years.

Relevance to SDGs Implementation: A long way ahead

With a view to the SDGs implementation, as a private player, SIMEC Foundation has been conducting its philanthropic activities for skill development of the youths and women in rural Bangladesh to make them skillful and prepared for building a sustainable economy and society. Skillful people can contribute to the family, society, and to the country in a dignified manner for their life-long economic solvency. SIMEC Foundation has a noble vision to extend its philanthropic activities to the society where it will contribute to the skill development of the youths, and women in rural Bangladesh to make them capable enough for their livelihood.

SIMEC Foundation- as a charity organization has incorporated the agenda of Sustainable Development Goals (SDGs) declared by the United Nations that is to be accomplished by 2030. Along with the Bangladesh government, the Foundation is working on some specific goals to implement these at the grassroots level. The specified goals of the SDGs that SIMEC Foundation is working with through its three major programs can be understood from the below:

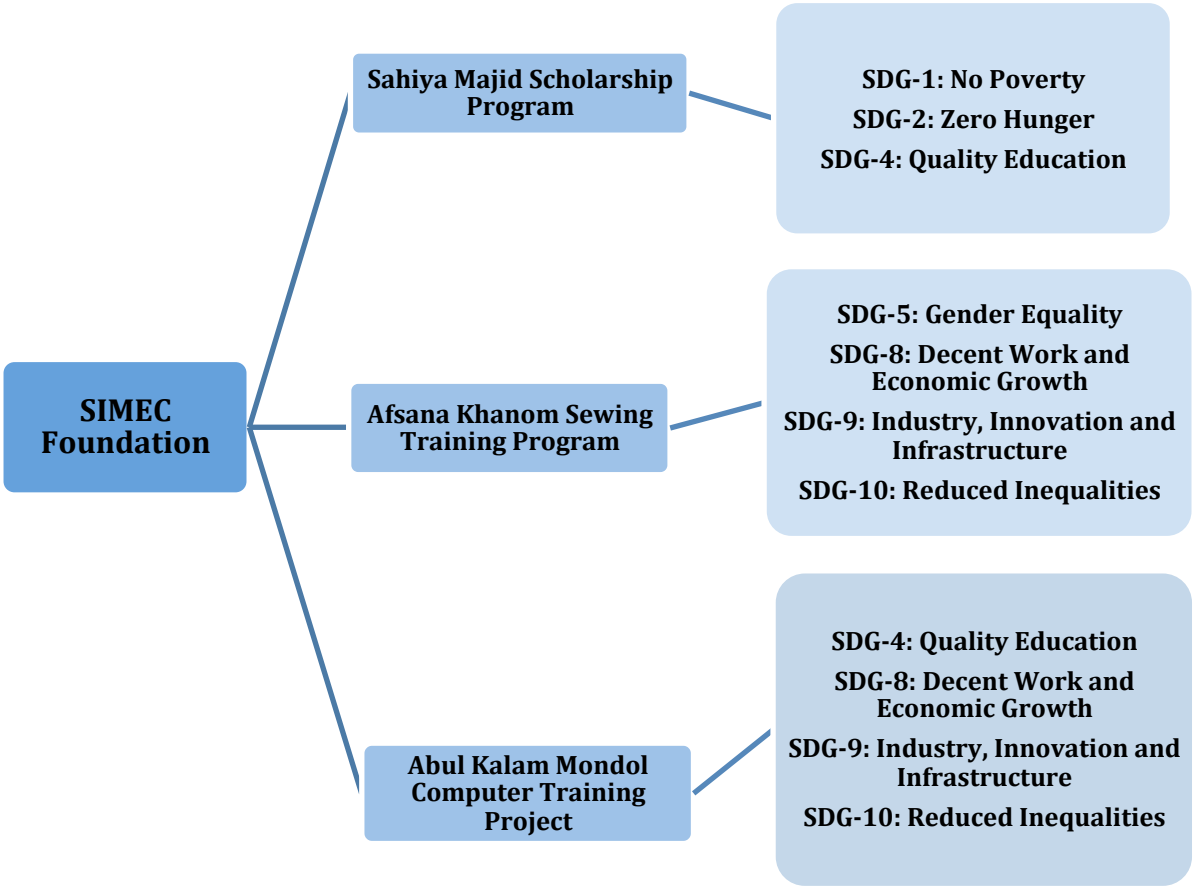

Figure 1: Activities and programs implemented by SIMEC Foundation resonates to the SDGs.

By providing skill-based training to the youths and women, the SIMEC Foundation is trying to pull them out of poverty. Training facilities for women help them to be financially

independent that helps empower them and reduce gender inequality in society. Computer training programs are contributing to employment opportunities with quality professional education in an innovative manner. The Foundation aims to expand its philanthropic activities in the coming days with the support of government and partner organizations from home and abroad.

There are many such initiatives taken by homegrown philanthropic organizations like SIMEC Foundation in Bangladesh. There is a crying need for knowledge sharing and exchange of views among these philanthropic organizations to make the efforts more fruitful and sustainable for the coming days. Collaboration among the homegrown philanthropic organizations that work for human development through education and professional training activities should be more tangible to make the efforts more effective. Along with the government's initiatives and policymaking, the collective approaches from the non-governmental philanthropic organizations can address the unemployment issues that still exist at the grassroots level of Bangladesh. Some of the drawbacks can be identified as-

 The unwillingness of the family to let their girls step out for higher education and vocational training on religious grounds.
 Lack of awareness on Vocational Education and Training and looking down upon it in comparison with the general education curriculum.
 High dependence on the agriculture sector for the rural economy.
 Lack of internet facilities and rural and remote areas.
 Lack of skilled and experienced teachers/trainers and inadequacy of equipment in technical educational training institutes.
 Sloth of government's initiatives and implementation of policy at the grassroots level to promote Vocational Education and Training.
Bureaucratic procrastination on approving the private technical educational institutions.
 Corruption and lack of professionalism among the officials in rural community development programs and vocational training sectors.

There should be a combination of government and non-governmental initiatives in the aspects of professional and skill-based training programs, so that these can be spread all over the country, especially in remote locations where people have lesser facilities of technical education. Some special initiatives should be taken for the outreach communities in the hilly and coastal areas of Bangladesh. The tribal communities both in the hill and plain lands of the country are lagging behind in the aspects of economic progress, where vocational training and education programs can play a vital role to improve their life and livelihood.

Conclusions

Bangladesh is one of the leading countries that export human-resources to the Middle-East and South-East Asian countries. But, unfortunately, these huge numbers of migrant workers contribute very little because of their low-skill and lack of language and professional efficacy. It is a great opportunity for Bangladesh if the country can provide them with skill-based training and language proficiency facilities before sending them abroad as migrant workers. Migrant workers from the neighboring countries of Bangladesh i.e. India, Sri Lanka, and Nepal are contributing more to their economy with better professional skills. A successful labor market along with a high and constant flow of foreign remittance depends on the skillful migrant workforce of a country. As the economy of Bangladesh is merely dependent on two-three sectors, where foreign remittance is the top most together with Ready-made Garments (RMG), and agriculture; the country has to be more careful to develop

the vocational and technical education sector to get a proficient workforce that can contribute more to the national economy. The syllabus and curriculum in the vocational institutes should be incorporated with the working sectors of the potential migrant workers for a better output in their professional fields. Government has to provide training at low-cost and facilitate the non-governmental institutions so that they can come forward to this sector in rural areas. There should be extensive research both at the academic and field level to understand the role, responsibilities, and challenges of community development in rural Bangladesh.

Internet accessibility has spread in the country over the last decade, especially since the current Awami League government came into power in 2008 with a vision of making Digital Bangladesh. Youths are becoming tech-savvy with their quick learning skills, and they started contributing to the national economy by freelancing in different virtual job platforms. This can be accelerated by the sponsorship of the government from an institutional level. The government of Bangladesh has already set up some universities and IT (Information Technology) parks to develop a skilled workforce with technological knowledge, but in comparison to the huge number of unemployed, these are not sufficient. Along with all the initiatives to promote the *Digital Bangladesh* concept, the government should set up more technical education training centers at district and sub-district levels to train youths from rural communities so that they can be capable enough to show their skills in digital job platforms. It is the high time that public-private partnership made some positive changes in socio-economic aspects in Bangladesh.

Acknowledgment

The authors would like to acknowledge Md. Daloar Hossain (Research Scholar, South Asian University), Ms. Anindita Mitra, and Md. Aminul Islam, Research Assistants of International Research Center, SIMEC Institute of Technology for review and research support, and the volunteers of SIMEC foundation to facilitate in the field.

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The Effect of Praising and Mutual Trust on Students' Learning

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Research has proven that praising is always considered an effective strategic way to motivate students in the classroom, raise their self-esteem, and promote their positive behavior (Floress et al., 2017; Allday et al., 2012). The literature defines two types of praise: general praise (GP) which is a general statement of approval, and behavior-specific praise (BSP) which describes a specific characteristic or behavior of a child (Floress et al., 2017). Burnett and Mandel (2010) reported that Australian children want to be praised for their achievements and behaviors. This research investigates two cases. In the first case, the researcher studies how positive praise promotes Japanese students' self-learning and active engagement in a sixth-graders English class, whereas Japanese students are known to be shy and tend not to engage in English classes for fear of making mistakes. In the second case, the researcher shows how positive praise and constructional feedback can alter the aggressive behavioral attitude of a sixth-grader Egyptian child in the classroom into active engagement and a sense of responsibility. The research adopted a case study approach based on classroom observation and post-class interviews with the teacher for the first case and practical engagement with the student in the second case. The study suggested that the constant encouragement and praise during the class and the mutual trust between the teacher and the students that are derived by the safe learning atmosphere created by the teacher are the driving forces behind the students' positive behavior and active engagement in both cases.

Keywords: General Praise; Behavior-Specific Praise, Constructional Feedback, Self-Learning, Responsibility

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Introduction

Research has proven that praising is always considered an effective strategic way to motivate students in the classroom, raise their self-esteem, and promote their positive behavior. When students are praised by their teacher, they tend to engage and participate actively in the classroom, think positively, and build mutual trust with their teacher. However, when students are scolded in front of their peers and are afraid of the teacher, they tend to retreat from the class and their performance is widely affected. They show negative behavior and this attitude is reflected in their relationship with their teacher and their peers.

In Japanese schools, most of the Japanese students do not engage actively and willingly in the English class. They always show no interest in the subject and when they are asked, they barely answer. This has been a major issue for English subject teachers over the years. The teachers know that students' fear of making mistakes in front of the others or being scolded or laughed at are the main reasons behind this negative behavior.

On the other hand, one of my students showed aggressive behavior towards his peers and was always a trouble-maker. He had very low self-esteem and this had affected his performance remarkably. My major issue was to find a way to deal with him to gain his trust in order to improve his poor behavior.

This research aims to emphasize the importance of positive praising and to highlight its impact on students' performance in the classroom, and to prove that praising and constructional feedback can alter students' negative and aggressive behavior into an act of active engagement and nurture their sense of responsibility.

Methodology

This research adopted a case study approach. The researcher investigated two case studies from different countries. The first case is for grade six Japanese students' English class in T Japanese national school in Japan. The investigation was done by class observation and post-class interview with the Japanese teacher (JT) and the Assistant Language Teacher (ALT).
The second case is for an Egyptian student M in N international school in Saudi Arabia. The study was based on the researcher's practical engagement with the student for a whole academic year.

Literature Review

Floress et al. (2017) and Allday et al. (2012) define two types of praise: general praise (GP) which is a general statement of approval, and behavior-specific praise (BSP) which describes a specific characteristic or behavior of a child. For decades, researchers have been studying the relation between positive praise and students' outcome (Becker et al., 1967; Dufrene et al., 2014; Reinke et al., 2008; Sutherland et al., 2000, as cited in Floress et al., 2017). Epstein et al. (2008) indicated that when students are praised for demonstrating good behavior in school, they are more likely to work better and experience social and behavioral success (as cited in Floress et al., 2017). Floress et al. (2017) consider praise as reinforcement of the behavior. Burnett and Mandel (2010) reported that Australian children want to be praised for their achievements and behaviors. On the other hand, not all students want to be praised loudly or in front of their peers; since they may find this uncomfortable or even punishing. Additionally, students who reported that their classroom was a positive environment reported

a positive relationship with their teacher (Burnett, 2002, as cited in Burnett and Mandel, 2010). Ikeda et al. (2014) say that it is important to monitor the effect of verbal praise (Ikeda calls it verbal reward) on students' motivation and actions and whether this praise will reinforce their behavior or not. Instead, it is suggested to specify a specific action or performance and praise this action or performance accordingly.

Oona McGee (2020) reports that Japanese students are taught English in Japanese "Katakana pronunciation"[1]. When it comes to communication in class, no one wants to speak differently from the others. Therefore, students do not try to improve their pronunciation and speaking skills in order not to look different from the others, or not to be laughed at or bullied during and after the class. Another main reason is their fear of making mistakes in front of the others and their "shy" personalities. Japanese education system promotes group mentality and emphasizes the importance of moving with the group. Thus, no one wants to speak out and look different from the others. However, this concept hinders individual improvement and the opportunity to learn (Tsunekawa, 2019, updated in 2020).

Study

The First Case: Grade Six Japanese Students

As mentioned above, Japanese students are known to be shy and tend not to engage in English classes for fear of making mistakes in front of each other. For years, Japanese teachers have struggled to find a proper methodology that may help students involve in the class. This research studies how positive praise can create a safe learning atmosphere for students and promote their self-learning and active engagement in the English class. As part of my job in the university, I visit schools and observe classes and provide support for teachers, when needed, for constant development of the teacher's professionalism. The aim is to collaborate with and support the teachers to nurture self-learners who can act autonomously and promote their passion for learning and exploring. Last year, I observed the sixth-graders English class in T school along with other university staff members and other teachers from the same school. In this class, there was a JT and an ALT. The system of ALT in Japan started in 1987 to develop and promote mutual understanding and for the internationalization between Japan and foreign countries[2]. Moreover, the presence of the ALT in the classroom provides an opportunity for students to learn real English from native speakers and to improve their communication skills.

Right from the beginning, the students showed a different attitude than usual. They greeted the guests warmly and welcomed us with smiley faces. In a normal class, students would start murmuring and they would not show any interest. The class started with teachers and students greeting each other to create a good atmosphere for learning. The ALT then explained the task and collaborated with the JT to provide an example of the activity for the students. The task was to introduce some attractive places in Japan utilizing the phrases they had learned in previous classes. As a result of the spread of the Coronavirus, students were not able to travel and explore new places. Instead, the teachers decided to make it up for the students by letting them look for attractive places in Japan and introduce them to each other

[1] Katakana Pronunciation refers to the pronunciation of English words as they would be written in Katakana, which is one of the Japanese alphabets used for pronouncing and writing foreign words. For example, "Book" will be pronounced as "Bukku", "Hello" will be "Haro".

[2] Most of the ALTs in Japan come and work through the JET programme. For more details on the JET programme, please visit this website http://jetprogramme.org/ja/history/.

to make the learning more fun and engaging for the students. The teacher wrote on the board some of the previously learned phrases and adjectives that can help the students with their activity, for example, it's amazing, it's wonderful, it's exciting…etc. The students started practicing in pairs. They moved actively from one pair to another and were widely engaged in the activity.

The next activity developed to a broader spectrum of introducing famous food and places in other countries. The students were asked to prepare for this activity in advance since it requires some time for searching. The two teachers again provided an example for the students. This time the teachers, intentionally, practiced a weak example in front of the students to promote their communication skills. Then, the students were asked to identify the mistakes in the teachers' communication and explain how they should be improved by suggesting alternatives. This method nurtures courage in the students and creates a safe and secure learning environment. In one way, it enables the students to distinguish the mistakes and point them out without shouting or scolding, and in another way, it promotes students' communication and positive engagement without the fear of making mistakes. Moreover, the students were also asked to praise the good parts in the example and provide feedback on it. When the teachers provided an example with mistakes, they showed the students that it is acceptable to make mistakes without being scolded or laughed at. However, at the same time, it is crucial to learn from those mistakes and accept comments and positive feedback from each other to improve one's skills.

The students were then asked to decide on one goal they want to achieve or improve during their next practice, for example, maintaining eye contact, speaking with a loud voice, being interactive with their partner…etc. The students started the activity. They practiced in pairs again, each one presenting his/her country to the other. After finishing the presentation, they asked their partners about what to improve in their performance. They provided feedback to each other and praised the good skills that each one could attain. They actively made good use of the advice and improved their performance with their next partners. The activity was even extended to the guests as well, which is something very rare. The students approached the guests *willingly*, including myself (it is something very rare for Japanese students to engage with foreigners they meet for the first time), and presented their countries. I asked one student a question on her presentation. Although she could not find the relevant word in English, she did not struggle or step back. She said what she could in English and supported her answer with some Japanese words. She was very interactive and smiling all the time. She knew it was acceptable to do her best and not be perfect; therefore, she did not fear combining English and Japanese to achieve her goal. I told her the word that she did not know in English and she used it and was very happy that she could communicate with me. This behavior is very uncommon among Japanese students and it obviously reflects the ease the students feel and the high self-esteem that is raised in them through praise and positive feedback.

The mutual feedback and praise that they provided to each other indicate that it is a practice they have seen and learned from their teacher, that had been nurtured in them over time. The students looked very motivated throughout the class and ended the class with a smile. They were eager to learn from each other and did not hesitate to ask for help from each other when they needed it. The ease they felt and the safe atmosphere that was created by the teachers generated a self-learning environment and allowed the students to thrive.

During the post-class interview with the teachers, the ALT spoke highly of the Japanese teacher and her behavior with the students. When he was asked about the reason behind the students' positive behavior and active engagement, he said that the reason was the teacher. He spoke of the big difference between the performance and attitude of the students in this class and other classes of the same school and other schools. He said that her tool was praising and creating a relaxed and safe learning environment.

The Second Case: An Egyptian Student M in N International School in Saudi Arabia

In the second case, the researcher proves that positive praise and constructional feedback can alter the aggressive behavior of a student into active engagement in the classroom and raise his self-esteem. The target student is a sixth-grader Egyptian boy M who was transferred from a national school in Saudi Arabia to the international school I used to work at. It was my first year in that school in Saudi Arabia. I was still less experienced especially in dealing with boys of this age. The class consisted of 32 boys, all with diverse countries and backgrounds. It was always said that the boys, especially of this age, have to be dealt with strictly and shouted at when misbehaved. However, this method did not work out especially with M. He constantly misbehaved in my class and would cause trouble to the other students. Sometimes I could not hide my frustration and I would shout at him strongly in the class. His peers would mock him for being shouted at which lowered his self-esteem and pride and made him feel insecure. He could not trust anyone. This was reflected in his academic performance, as well. He never followed instructions. He would deviate from the theme provided for the essay and write whatever he liked. Therefore, his marks were always very low. I began to empathize with him and I did not like when students mocked him. Therefore, I decided to try a different method.

Strictness is needed, but it is not the solution to all cases. Therefore, I worked on building trust with M and between him and his peers. I realized that securing my students mentally and emotionally was the key to their minds. In my class, I decided on different roles, for example, class monitor, date keeper, board eraser…etc. for the students to motivate them and nurture their sense of responsibility. These roles were changed weekly. I gave M the role of the monitor of the class, that is to monitor the class till I come and report any misbehavior from any student to me. He was never given this role before by any other teacher; since it is the most important. When M was assigned this role, he showed a pure happy smile on his face which was never there before. It was challenging yet very motivating for him. His role started the next day. The next day, I came into the class and found many names written on the board of those who misbehaved before I came. These students were sure I would not believe M as he was not trustworthy; therefore, they did not show any respect to him as a monitor and did not follow his instructions. When I came in, he reported to me what had happened and I trusted his words. Those who misbehaved were warned as agreed. This act was the first step towards building mutual trust with M. The next day when I came into the classroom, there were no names on the board. All the students behaved well and respected M as the monitor. He reported no mischief and I believed him. Since then, he started to feel responsible and proud of himself.

The next step was to follow his academic performance. He had the potential in writing essays; however, he only needed the proper guidance. I decided to guide him in private not in public to provide him with a chance to consolidate and rethink what he needs. I changed my way of feedback to him. I started to focus on the positive points in his work and behavior (behavior-specific praise), and share them with the others to help him realize his strengths

and work on improving them. After a short time, he started to show remarkable improvement not only academically, but also behaviorally. He stopped making trouble and started making friends and building trust with them. He started raising his hand in the class more often to answer. Even when mistaken, he did not give up.

One day he wrote a great essay. I made him read it in front of the others as I always did with those who wrote good essays. Since it was his first time, he was nervous, but he managed to read it till the end. After he finished, his classmates praised him and they pointed out the strong points in his essay. It was clear that he gained self-confidence and his classmates realized his change. He smiled and returned to his seat with his body stretched up. He could finally feel himself part of this community and not an outsider who was always left behind.

Conclusion

This study proves that the constant encouragement and praise during the class and the mutual trust between the teacher and the students that is derived by the safe learning atmosphere created by the teacher are the driving forces behind the students' positive behavior and active engagement. The teacher plays a crucial role in supporting the students and securing them mentally and the students are directly affected by the behavior of the teacher in the classroom. In this study, I intentionally went beyond borders and introduced two cases from different countries to define the relationship between the teacher and the students, and to prove that all the students want to feel safe and secure regardless of their nationality.

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An AI-Enable Knowledge Graph and Student's Agency in Productive Struggle During Problem-Based Learning in Cybersecurity Education

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The IAFOR International Conference on Education in Hawaii 2022
Official Conference Proceedings

Abstract
Problem-based learning (PBL) is adapted to support students' learning in cybersecurity courses. However, students frequently lack learner agency and require step-by-step instruction. With an instructor's minimum help, students struggle with integrating coherent target concepts, applying those concepts to solve real-world problems, and managing their learning progress. To respond to the national challenge on the workforce development in AI for Cybersecurity, we propose a novel AI-enabled CyberSecurity knowledge graph (AISecKG) in the hands-on labs to simulate real-life cybersecurity scenarios, support students to engage in productive struggle, and enhance learner agency in Cybersecurity problem-solving. We interviewed twelve students after two projects to understand what dimensions affect their learner agency and if AISecKG, an AI-enabled knowledge graph, help them develop learner agency in solving Cybersecurity problem. The results reveal four dimensions of learner agency in problem-solving: productive struggle during the projects, alignment between instructor and student expectation, familiarity with the PBL tasks, strategies for sensemaking. The rubric scores showed that students used AISecKG in productive struggle, alignment between instructor and student expectations and sensemaking strategies and generally improved their learner agency after the second project.

Keywords: Knowledge Graph, Student's Agency, Problem-Based Learning, Cybersecurity Education

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Introduction

Cybersecurity education is mostly problem-based learning (PBL) in nature. Cybersecurity issues usually involve complex, multifaceted real-world problems that demand students actively engage in productive struggle, adopt an adaptive learning strategy to identify problems and solutions, evaluate and manage their learning progress. However, traditional lecture-based instruction is insufficient in engaging students in real-world problems and hands-on experience and systematically providing effective guidance for students to build their understanding from diverse learning history and backgrounds. Leaning results are often composed of fragmented information, and students lack problem-solving transferability in the new contexts. Without the instructor hand-holding students through step-by-step instruction, students have difficulty developing their agency to advance their problem-solving process.

The roles of learner agency on learning have been explored as a critical factor for learning success. Learner agency has defined as, for example, an individual's will and capacity to act (Gao, 2010) and learners' capacities for autonomous, self-regulated behavior (Bown, 2009). Manyukhina and Wyse (2019) conceptualize learner agency into 1) learners' personal sense of agency (i.e., belief in their ability to make changes in their learning and 2) learners' agentic behavior (i.e., the actual acts to take active control in their learning process). Recently, many researchers adopted complexity theory and situate learner agency in a complex dynamic system, beyond just students, and their cognitive and willpower control (Manyukhina & Wyse, 2019). This paradigm takes a more balanced view between students and learning space as they co-exist and view equal significance in both the individual and the context (Blaschke, Bozkurt, & Cormier, 2021; Mercer, 2011).

Building on our previous work, we implemented state-of-art technology to create environments and networks that promote learner agency (e.g., Deng, Lu, Hung, Chung, & Lin, 2019). We propose AISecKG, an AI-enabled knowledge graph, to enhance learner agency and address cybersecurity education challenges. AISecKG was built based on an interdisciplinary approach to address the identified cybersecurity education challenge in two highly interdependent research focuses: 1) employ ML/AI approaches to build new cybersecurity guidance by measuring and setting up similarities and dependencies among cybersecurity learning targets (or problems) that can be used for both study planning and learning-outcome assessment; and 2) design an effective learning outcome measurement framework to design cybersecurity curricula, scaffold student cognitive engagement, and improve students' learner agency and learning outcomes through a multi-level assessment approach.

This study examines students' learning experience in AISecKG, the critical components of learner agency, and whether AI for Cybersecurity can improve learner agency. With the notion that individuals as learning agents can *interact* with their contexts, rather than just *react* to them (Mercer, 2011), AISecKG provides an active learning environment expected to create active learners and agency in problem-solving. AISecKG enables self-directed, connected network learning to support students in developing the authorship of their problem solving -- actively taking control, monitoring, and progressing their learning. That AISecKG guides the active problem-solving (i.e., local agency) support students encountering struggles for deep understanding, managing their learning process, gradually developing sustainable problem-solving transferability (i.e., global learner agency).

Methodology

Research Design

This study is conducted at a cybersecurity course of a public university located in the Southwest United States. Fifty-seven students are enrolled in the course. Students are required to engage in two PBL projects that address real-world complex problem scenarios with the support of a virtual lab environment and AISecKG scaffold. Twelve students were selected for interviews at the end of the first project. The same set of students, but eight, remained for interviews at the end of the second project to understand their initial perceptions and changes in their learning experience and strategies when using AISecKG.

AISecKG - Knowledge Graph

At the beginning of the semester, we introduced AISecKG to support students in solving the problem on the given projects. AISecKG is an integrated machine learning (ML) and artifact intelligent (AI) and cybersecurity knowledge graph to generate learning-related and domain-specific knowledge. We used our existing AI and cybersecurity projects and lab descriptions to create problems to concepts mapping, in which each task and subtasks are converted to a problem. We can then use Natural Language Processing (NLP) to extract concepts embedded in the corresponding task and subtask description. Using AISecKG, we can perform a learning material indexing and correlation procedure by creating individual hands-on labs' subgraphs of AISecKG (represented as subKG). A subKG presents each lab's main learning concepts, with which we can present its correlations (i.e., concepts overlapping) with other labs. In this way, we can present a three-level knowledge representation from the top course project (or lab) to a set of problems and concepts at the bottom.

Analysis

After each project, we interviewed twelve students with Zoom video conference. The interviews were transcribed into texts for further analysis. We utilized the constant comparative method based on the grounded theory approach to develop the coding book iteratively. The final coding book captures positive experiences, negative experiences, suggestions, and learning strategies. Based on the coding book, we closely examine what learning aspects support or hinder students' learner agency – the ability to control actively, monitor, and progress their learning.

The exhaustive examination of the coding book reveals the four dimensions of learner agency in problem-solving. Whether students will be able to solve the problem and actively control their learning progress depends on 1. productive struggle during the projects, 2. alignment between instructor and student expectation, 3. familiarity with the PBL tasks, and 4. strategies for sensemaking. *Productive struggles* demonstrate how much students engage in productive problem-solving struggles when they encounter difficulty. *Alignment between instructor and student expectation* is defined by the gap of the learning process and project product expectation between instructors and students. *Familiarity with the PBL tasks* indicates how much students are familiar with and feel comfortable with cybersecurity domains or knowledge graphs. *Strategies for sensemaking* involve students' strategies to make sense of problems and overcome them.

Learner Agency Rubric

We later incorporated the four dimensions into Learner Agency Rubric to advance theory on learner agency and assess students' learner agency progress after using AISecKG in the two projects in the cybersecurity course. Each dimension was further defined and assigned a score ranging from 1 to 3. A score of 1 means students are at the beginning of that given dimension and have a large area of learner agency growth. A score of 2 means students become authorship of their learning, but some learning aspects are underdeveloped. A score of 3 indicates that students demonstrate the desired level of learner agency. After engaging in productive struggle during problem-solving, students are expected to have a realistic alignment with instructors, feel familiar/confident with the problem solving and knowledge graph, and use high-level strategies to solve problems. The full definition of the rubric is below (See Table. 1)

Dimensions	Basic (1)	Transition (2)	Advance (3)
Productive Struggle	Students engage in **unproductive struggles** that do not facilitate learning and need to **remove** them	Students engage in **unproductive struggles** that do not facilitate learning, but they can **be productive struggles** with instructional design. Students engage in **some productive struggles**	Students engage in **productive struggles** as they involve the below problem-solving process when they encounter difficulties such as: 1. Identify problems/ knowledge gap 2. Explore potential solutions 3. Evaluate all solutions to identify the best one 4. Apply knowledge to the new situation Students realize what they learn from the struggles and **appreciate** the learning opportunity stemming from difficulty.

Alignment between instructor and student expectation	Student expectation on learning process and products does **not alight** with an instructor	Student expectation on learning process or products does **not alight** with an instructor	Student expectation on learning process and products **alight** with an instructor
Familiarity with the PBL tasks	Students are **not familiar** with Cyber Security domains or knowledge graph	Students are **moderately familiar** with Cyber Security domains or knowledge graph	Students are **familiar** with Cyber Security domains and the knowledge graph.
Strategies for Sensemaking	Students use **low-level strategies** to engage in **unproductive struggle.**	Although students use **high-level strategi**es to solve problems, they engage in **unproductive struggle.**	Students engage in **high-level strategy**, use several strategies to solve the problem, and engage in **productive struggle**.

Table 1: Learner Agency in Problem Solving Rubric

Results

Problem-Solving Experience with AISecKG Support

The results showed that students positively consider that the struggles with the support of AISecKG help them develop a deep understanding of cybersecurity knowledge through PBL. The design of AISecKG guides students in the global view of learning paths, which indicate concepts and their relationship in given problem domains. AISecKG facilitates students to recognize, identify, conceptualize, and integrates all necessary cybersecurity concepts needed to solve the problem as students commented that:

It's very helpful because it gives like the student a hint on what he is about to do.
And what is expected and, like the areas that he is supposed to be not knowledgeable but should be

I found to be extremely helpful, I definitely was able to use the knowledge graph to see like okay here are the concepts that I need to know.

And I had that open and then I also had this knowledge graph open another window, so that I could like if I saw something in the IP you know, in the IP tables lab document I could go to the knowledge graph, and it would quickly take me to the wiki link with a few clicks that was that was pretty convenient.

I pull knowledge graph up real quick, so I can actually have a visual reference to it because I did use it throughout the labs.

Students also use the connected network and multimedia in AISecKG to enhance their learning, such as correcting their misunderstanding and expanding their knowledge from what has been learned in the course to what has been practiced in authentic cybersecurity settings. These behaviors driven by AISecKG are associated with active learning or what we defined here as an immediate, local learner agency. This kind of local learner agency happens when students manipulate information and control their learning process to promote their global learner agency in productive struggle through problem-solving as students asserted:

yeah for me the video tutorials where we're more helpful.. I was formatting it incorrectly from the text.. just in general, if I learned a lot better through something that is visual like a video
One of the things that I would like is, you know how there's a little hyperlink on the far right there's a little circle to expand it if that was changed to just.

Go back and just click on this little link right here and immediately go back and see what is that, how do I use this, how do I implement this.

Go to the knowledge graph and it would quickly take me to the Wiki link with a few clicks that was that was pretty convenient

The sense of agency can be sustained and flourished if students are aware, own to their actions, and appreciate their ownership, as students mentioned:

It makes us more confident on doing the next lab because we've debugged all everything, we did everything by ourselves, this is our work, this is our understanding.

Learner Agency Progress

We interviewed twelve students to develop Learner Agency in Problem Solving Rubric. The rubric has two-fold benefits 1) theoretical advancement to identify the critical components of learner agency in problem-solving and 2) measurement construction to evaluate students' learner agency and their progress.

The rubric scores from the eight students on interview after 1st project and 2nd project showed that at the end of 2nd project, students have the closer expectation to an instructor, engage in more productive struggle, and employ high-level strategies to solve a problem during a productive struggle (See Figure 1). Students reported the learning process and outcomes alignment between student and instructor expectations. They expect less spoon-feed support from an instructor and invest their time in productive struggle, trying to overcome challenges while learning from the struggle. Also, they have a better understanding of outcome expectations and can concretely visualize the expected artifacts/products. The excerpts below demonstrate Josh's.

Project1_Josh*: "I feel less confidence in my execution, and so I was just* ***having a lot of struggle understanding what I was supposed to turn in"*** *(Score 1)*

Project2_Josh*: "I definitely was able to use the* ***knowledge graph*** *to see like okay here are the* ***concepts that I need to know****. All of the it's almost like if you were* ***baking cake,*** *it's like I want you to bake the cake here's* ***what the final thing should look like****. And I have a* ***general understanding*** *okay it's a cake, so it probably need sugar it probably needs flower, but then it's my job to go out and find. How does all of this work together." (Score 3)"*

Although students got lost in the first project, spent the most time figuring out what they needed to do, and spent less time working on problem-solving, they later developed high-level strategies to handle challenges and learn from productive struggle. Students described that they get lost in the first project since they are uncertain about what they are doing, what they need to do, for what reason, and what outcomes may happen. Thus, they rely on lower strategies such as trial-and-error and reread materials. However, after they started to use AISecKG, they utilized the knowledge graph to productively handle the struggle, such as problematizing, identifying concepts needed to solve a problem, and developing solutions.

Project1_Sony: This lab was to open, I mean, for me it was like too broad, I should say so ***it was really hard to get what I was doing*** *the beginning, which was to like really long time to figure out what I was actually need to do" (2)*

Project2_Sony: It sort of direct me to the answers. Like if I know my question and I know my answers, but if I don't know my question like sometimes I just stuck on something, but I don't really know what's, the problem is, ***then I have to figure out the problem first****" (Score 3)*

Project 1_Nadia: "Actually I didn't make it too much use of the knowledge graph. ***I read lecture slides again****, if I have any problem." (2)*

Project 2_Nadia: "I got stuck would check the knowledge graph and see ***if I miss something****.. that can help me understand* ***different levels of knowledge*** *is I mean just just look at just like what to the knowledge graph." (3)*

Figure 1: Learner Agency Progress

Conclusion

The learner agency influence students' experience, process, and outcomes. We found that productive struggles, alignment between instructor and student expectation, familiarity with the PBL tasks and strategies for sensemaking involve in students developing learner agency in problem solving. The rubric scores showed that students using AISecKG in productive struggle and sensemaking strategies generally have a closer alignment with an instructor's expectations and improved their learner agency after the second project.

Acknowledgement

This research is supported by the National Science Foundation under grants DGE-1723440 and 2114789.

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A Model-Based Inquiry Activity Using LEGO to Promote System Thinking of Grade 11 Students on Buffer Solution Topic

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The IAFOR International Conference on Education in Hawaii 2022
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Abstract
System thinking in chemistry education aims to prepare future students who can apply the chemistry knowledge to addressing real-world complex phenomenon and have more holistic perspectives. The system thinking skills are divided into three levels: (1) analysis of system components, (2) synthesis of system components, and (3) implementation. In this study, a model-based inquiry learning activity using LEGO was developed in order to promote students' system thinking on the topic of buffer solutions. In the activity, LEGO was used as a tool for students to simulate systems for representing the pH controlling process in related natural phenomena such as maintaining the pH of seawater, the circulatory system, and the food industry, etc. The activity was implemented for 30 Thai high school students in the science and mathematics program using a one-group pretest-posttest design. A test on system thinking specific to the buffer solution topic and a student's self-evaluation questionnaire on system thinking skills were used as tools for collecting data. An analysis of the three levels of system thinking skills showed that the average posttest score of each level was significantly higher than the pretest score in all levels especially in the synthesis of system components level and students could apply the knowledge to the real-world issues. After the activity, students' reports from the questionnaire indicated that they could relate each component in the systems and could expand their knowledge to other systems.

Keywords: Model-Based Inquiry; System Thinking; LEGO; Buffer Solution; High School

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Introduction

According to the 20-year National Development Plan in Thailand, there is a desire to increase the level of satisfaction of establishments with graduates (Office of Education Council: ONEC, 2017). However, the graduates' competencies do not match the requirements of establishments (Office of Education Council: ONEC, 2017). Students lack skills and knowledge that connect what they have studied to daily life, which affects their future jobs (Orgill, York, & MacKellar, 2019). Especially, based on the 21st-century skills, thinking skill is one of the learners' key competencies that are needed to be developed (The ministry of education Thailand, 2010).

System thinking in chemistry education aims to prepare a new generation of students who can apply their chemistry knowledge to addressing real-world complex phenomena and be able to use their system thinking skills in their future jobs (Orgill et al., 2019). System thinking in chemical education consists of eight skills which are divided into three levels: (1) analysis of system components, (2) synthesis of system components, and (3) implementation which are shown in table 1 (Assaraf & Orion, 2005).

Table 1: Three levels of system thinking

Level of system thinking	Skills
Analysis of system components	The ability to identify the components of a system and processes within the system.
Synthesis of system components	The ability to identify relationships among the system's components.
	The ability to identify dynamic relationships within the system−understanding how the components of a system are related and affect one other as a function of time.
	The ability to organize the systems' components and processes within a framework of relationships-understanding that all of the relationships within a system are interconnected.
	The ability to understand the cyclic nature of systems−understanding the repetition in the system's behavior and the cause of the repeating behaviors.
Implementation	The ability to make generalizations−understanding general patterns in the system that can be applied to other systems or situations.
	Understanding the hidden dimensions of the system−understanding invisible components and processes that contribute to the system's behavior.
	Thinking temporally: retrospection and prediction−understanding the cause that impacts the current behavior of the system or the effect of interventions on the system, and how current actions affect the future behavior of the system, then students will be able to predict what will happen when the system interferes, and apply that knowledge to other circumstances

Many topics in chemical education can be implemented by embedding a perspective of system thinking into lesson plans, including earth systems with a focus on the hydro cycle

(Assaraf & Orion, 2005; BenZviAssaraf & Orion, 2010), carbon dioxide and climate change (Aubrecht et al., 2019), and catalysis (Ravi, Puente-Urbina, & Bokhoven, 2021). The buffer solution topic can be embedded with a system thinking perspective because it is related to other concepts such as the particulate nature of matter, chemical reactions, stoichiometry, chemical equilibrium, acid-base chemistry, and to everyday life as well. (Kusumaningrum et al., 2017). However, like many other topics in chemistry, buffer is an abstract topic by nature (Şendur, Toprak, & Pekmez, 2011). Students are required to understand the concept at submicroscopic and symbolic levels, which might be difficult for them to understand the content (Setiadi & Irhasyuarna, 2017). Therefore, teachers should play a key role in helping students overcome this difficulty by designing learning activities to help them understand the macroscopic aspect, sub-microscopic aspect, and symbolic aspect of the concept (Johnstone, 1993; Chittleborough, 2014). Models such as LEGO can be used to represent the sub-micro particles in the substances being observed (Chittleborough, 2014). LEGO was used as a model for teaching chemistry for many topics, including stoichiometry (Witzel, 2002), ionic bonding (Ruddick & Parrill, 2012), nanotechnology (Campbell, Miller, Bannon, & Obermaier, 2011), chemical equilibrium, reaction kinetics (Cloonan, Nichol, & Hutchinson, 2011), and catalysis (Horikoshi, Kobayashi, & Kageyama, 2013), because LEGO bricks can easily be connected and disconnected, allowing for rapid model construction and modification, and they can be used to represent a fraction of atoms, and molecular compound models (D. Campbell et al., 2011; D. J. Campbell, 2004).

Regarding the importance of system thinking skills that can help students examine and address complex behaviors and phenomena from a more holistic perspective (Orgill et al., 2019), the skills could be articulated via inquiry-based instruction. Inquiry-based instruction is widely used in science teaching because the method can promote students' understanding of the nature of scientific discovery or scientific method as well as how scientists explain knowledge of the natural world (National Research Council, 2000). Therefore, in this study, a model-based inquiry learning using LEGO bricks as a model was developed to promote students' understanding and system thinking skills on the buffer solution topic. When students think systematically, they can recognize the significance of learning science that affects the environment and their daily lives, which corresponds to the establishment's required skills.

The Development of Model-based Inquiry Using LEGO Activity

In this study, there are three model-based inquiry activity plans which are designed to teach students about the change in pH of the water and a solution of acetic acid and sodium acetate in the laboratory; daily buffer solution activities from a food or hair care manufacturing industry situation; and daily buffer solution activities from an acidosis disease situation. Overall, the lesson plans took up a total of ten periods: 4 for the first plan, and 3 each for the other two.

A model-based inquiry learning activity using LEGO was then developed to promote system thinking of students on the buffer solution topic. The relationships between model-based inquiry and system thinking are shown in table 2.

Table 2: Relationships between model-based inquiry that according to system thinking

The level of system thinking	System thinking skill	Alignment with model-based inquiry learning process
Analysis of system components	Ability to identify the components of a system and processes within the system.	**1. Engaging with questions or problems** Sample question: 1) What are the components of the system and what are their characteristics?
		2. Developing assumptions or hypotheses
		3. Making systematic observations to test hypotheses– inquire the information or experiment and make observation to test hypothesis.
Synthesis of system components	-Ability to identify relationships among the system's components. -Ability to identify dynamic relationships within the system	**4. Creating models**– build a model to represent the components in the system using LEGO.
	-Ability to organize the systems' components and process within a framework of relationships - Ability to understand the cyclic nature of systems	**5. Evaluating the model**– create a description of the model's principles and assess it from the relationships of components that affect one another.
Implementation	- Ability to make generalizations -Understanding the hidden dimensions of the system - Thinking temporally: retrospection and prediction	**6. Revising the model and applying it in new situations**– modify the model and apply the model to other situations or contexts such as daily life, environment, etc.

The model-based inquiry activity plans were implemented during the COVID-19 outbreak situation. Hence, the activities had to be conducted online. Learning activities consist of 6 phases of model-based inquiry (Windschitl, Thompson, & Braaten, 2008). The details of the eight sub-skills which are divided into three levels of system thinking, their meaning which is related to the buffer solution topic, and their implementation in model-based inquiry are shown in table 3.

Table 3: The system thinking components, their meaning that relate buffer solution, and their implementation in model-based inquiry

System thinking components	Meaning in relation to buffer system	Implementation in model-based inquiry
Ability to identify the components of a system and processes within the system.	Ability to identify the buffer components in an acid-base conjugate pattern that maintains the pH process in a defined situation	Teacher defines the scenario of the buffer system in everyday life and engages with the question or problem, such as which components in this context play a part in buffer system pH regulation, then invites the students to hypothesize and inquire about the facts and observations to test the hypothesis.
Ability to identify relationships among the system's components	Ability to identify relationships among the acid-base conjugate components in a buffer solution when the amount of each is affected by the addition of acid or base	Students creates a model of the buffer components in the system, at least one pair of acid-base conjugates in that buffer system, using LEGO.
Ability to identify dynamic relationships within the system	Ability to identify dynamic relationships within the buffer system such as the amount change in an acid-base conjugate which is a buffer system's component involving the Le Chatelier's principle	Students creates a model of the buffer components in the system using LEGO with a lot of acid-base conjugates to show how the components in the buffer system interact dynamically.
Ability to organize the systems' components and processes within a framework of relationships	Understanding that all of the relationships within a buffer system are interconnected and expressed in a pattern by a chemical equation, which is a common framework understanding in chemistry	Teacher has students write the symbol as a chemical equation to represent the interactions and relationships of the components in the buffer system.
Ability to understand the cyclic nature of systems	Ability to understand the repeatition in the behavior of the buffer system and the cause of the repeated behaviors, such as understanding the dynamic change of acid-base conjugate and explaining how the buffer works to balance the system	Students makes a description of the model's principles, explain the reason for the change in the amount of acid-base conjugate, and assess the model from the relationships of components that affect one another.
Ability to understanding the hidden dimensions of the system	Understanding the invisible components and processes that contribute to the buffer system's behavior, such as the components of the buffer system in the microscopic aspect consisting of particulate levels, which can be used to explain the movement of electrons, molecules, particles, or atoms	Students notice the microscopic aspect of the buffer component while constructing the model.
Ability to make generalizations	Understand and apply general patterns of how the buffer works in the buffer system to other situations	Students illustrate the general pattern of interactions between LEGO models that can be applied to other situations.
Thinking temporally: retrospection and prediction	Understand the cause of the buffer system's current behavior or the effect of interventions on the system, as well as how current actions affect the system's future behavior, be able to predict what will happen when the buffer system interferes, and be able to apply that knowledge to other situations.	Students modify the model to fit different scenarios or contexts, such as daily life and the environment.

Research Method

This study aims to answer a research question "Can the model-based inquiry promote systems thinking in grade 11 students on the buffer solutions topic?"

This study is a one-group pretest-posttest design. The sample was 30 students from 5/8 class who are studying in science program in the second semester of academic year 2020 at Bodindecha (Sing Singhaseni) school. The purposive sampling was implemented to select the sample.

Samples' required background:
(1) The particulate nature of matter
(2) Chemical reactions
(3) Stoichiometry
(4) Solution chemistry
(5) Chemical equilibrium
(6) Acid/base chemistry

The instruments used in the study components:
1. The scenario-based test of system thinking in buffer solution
2. Student's self-evaluation questionnaire

The scenario-based test of system thinking in buffer solution

The tools developed using the scenarios-based test that aligned with each component of system thinking consist of writing an explanation, drawing a simple model after learning, and creating a model by using LEGO and graphic tools, which were infographics. The test has a total score of 27 and consists of 7 items. This could examine the level of system thinking skills of the students as shown in table 4.

Table 4: Sample question on buffer solution to test system thinking.

Level of system thinking	System thinking skill	Question	Item	Total score
Analysis of system components	Ability to identify the components of a system and processes within the system.	What elements in the sea play a role in regulating the pH of the sea and making the sea pH almost constant? (specified in the form of an acid-base conjugate)	1	6
Synthesis of system components	Ability to identify relationships among the system's components	When sea acidity increases, how does it affect the amount of acid-base conjugate in item 2?	3	2
	-Ability to identify dynamic relationships within the system -Ability to understand the cyclic nature of systems	Explain the reasons for the change in the amount of acid-base conjugate in item 3.	4	2
	Ability to organize the systems' components and processes within a framework of relationships	Write a chemical equation explaining the reason for the answer to question 3.	6	1

Level of system thinking	System thinking skill	Question	Item	Total score
Implementation	Ability to understanding the hidden dimensions of the system	Choose only one pair of acid-base conjugates from item 1 and show the particle model of that substance.	2	3
	Ability to make generalizations	Show a model to explain the reasons behind the answer of question 4.	5	2
	Thinking temporally: retrospection and prediction	If the rain that falls on this planet has the properties of a base, do students think that this rain flow into the sea will result in a sudden increase in seawater pH? Write a 1-page A4 infographic explaining the rationale behind the answer, using the questions 2–6 as a guide for the infographic design.	7	11

Student's self-evaluation questionnaire

The student's self-evaluation questionnaire on system thinking skills was developed using the five-point Likert-scale type (McCoach, Gable, & Madura, 2013). There are nine questions asking students to assess themselves after the implementation as evident by the test. The mean and standard deviation were used to analyze the data.

Result and Discussion

The total score of the test was 27, which can be divided into 6, 5, and 16 scores corresponding to each level of system thinking in the test and 8 system thinking skills (see table 5).

Table 5: Results of the pretest score and posttest score of system thinking test on buffer solution

Level of system thinking	Components of system thinking skill (Scores)	Pre-test		Post-test		t	Sig. (2-tailed)
		Mean±SD	Percentage (%)	Mean±SD	Percentage (%)		
Analysis of system components	1. Ability to identify the components of a system and processes within the system (6)	3.93±0.37	65.56	4.47±0.86	74.44	3.25	0.003
Overall (6)		3.93±0.37	65.56	4.47±0.86	74.44	3.25	0.003
Synthesis of system components	2. Ability to identify relationships among the system's components (2)	1.20±1.00	60.00	1.93±0.25	96.67	4.25	0.000
	3.Ability to identify dynamic relationships within the system (2)	0.23±0.43	11.67	1.87±0.43	93.33	16.08	0.000

Level of system thinking	Components of system thinking skill (Scores)	Pre-test		Post-test		t	Sig. (2-tailed)
		Mean±SD	Percentage (%)	Mean±SD	Percentage (%)		
Synthesis of system components	4. Ability to understand the cyclic nature of systems (2)	0.23±0.43	11.67	1.87±0.43	93.33	16.08	0.000
	5. Ability to organize the systems' components and processes within a framework of relationships (1)	0.37±0.49	36.67	0.87±0.35	86.67	5.38	0.000
Overall (5)		1.80±1.09	36.00	4.67±0.75	93.40	12.26	0.000
Implementation	6. Ability to Understanding the hidden dimensions of the system (3)	2.87±0.57	95.56	2.97±0.18	98.89	0.90	0.375
	7. Ability to make generalizations (2)	0.07±0.37	33.33	1.17±0.99	58.33	6.05	0.000
	8. Thinking temporally: retrospection and prediction (11)	1.83±1.98	16.67	7.30±3.53	66.36	9.28	0.000
Overall (16)		4.77±2.13	29.81	11.43±4.38	71.43	8.99	0.000
	Total (27)	10.50±2.34	38.89	20.57±5.12	76.19	10.88	0.000

From table 4, the total mean score of the posttest (20.56±10.07) was significantly higher than that of the pretest (10.50±4.84) at a .05 level of confidence. Overall, the results indicate that the model-based inquiry learning activity can promote system thinking skills in the students.

However, the results were further analyzed using normalized gain to gain in-depth information about the level of improvement in particular aspects of system thinking. Table 6 shows normalized gain scores of the system thinking test on the buffer solution topic in 3 levels of system thinking in each student.

Table 6: Results of normalized gain of system thinking test on the buffer solution topic

Student No.	Normalized gain of level of system thinking			Interpretation		
	Analysis of system components	Synthesis of system components	Implementation	Analysis of system components	Synthesis of system components	Implementation
1.	0.00	0.60	0.15	-	Medium gain	Low gain
2.	1.00	1.00	0.38	High gain	High gain	Medium gain
3.	1.00	1.00	0.67	High gain	High gain	Medium gain
4.	0.00	0.00	0.15	-	-	Low gain
5.	0.00	1.00	0.31	-	High gain	Medium gain
6.	0.00	1.00	0.18	-	High gain	Low gain
7.	0.00	1.00	0.17	-	High gain	Low gain
8.	0.00	1.00	1.00	-	High gain	High gain
9.	0.50	1.00	1.00	Medium gain	High gain	High gain
10.	0.00	1.00	0.54	-	High gain	Medium gain

Student No.	Normalized gain of level of system thinking			Interpretation		
	Analysis of system components	Synthesis of system components	Implementation	Analysis of system components	Synthesis of system components	Implementation
11.	1.00	1.00	1.00	High gain	High gain	High gain
12.	1.00	1.00	1.00	High gain	High gain	High gain
13.	1.00	0.50	0.30	High gain	Medium gain	Low gain
14.	0.00	1.00	1.00	-	High gain	High gain
15.	1.00	1.00	1.00	High gain	High gain	High gain
16.	0.00	1.00	0.57	-	High gain	Medium gain
17.	0.00	1.00	1.00	-	High gain	High gain
18.	0.00	1.00	1.00	-	High gain	High gain
19.	1.00	1.00	1.00	High gain	High gain	High gain
20.	0.00	1.00	1.00	-	High gain	High gain
21.	0.00	0.50	0.15	-	Medium gain	Low gain
22.	0.00	1.00	0.25	-	High gain	Low gain
23.	0.00	1.00	0.46	-	High gain	Medium gain
24.	0.00	0.67	0.15	-	Medium gain	Low gain
25.	0.00	1.00	0.55	-	High gain	Medium gain
26.	0.00	1.00	0.73	-	High gain	High gain
27.	0.00	1.00	1.00	-	High gain	High gain
28.	0.00	1.00	1.00	-	High gain	High gain
29.	0.00	0.50	0.18	-	Medium gain	Low gain
30.	0.00	1.00	0.50	-	High gain	Medium gain
Total	**0.25**	**0.89**	**0.61**	**Low gain**	**High gain**	**Medium gain**

Overall, students had gained in their level of analysis of system components, synthesis of system components, and implementation as indicated by low gain, high gain, and medium gain, respectively, and Figure 1 shows the percentage of the normalized gain scores of the system thinking test on buffer solution in 3 levels of system thinking in each student.

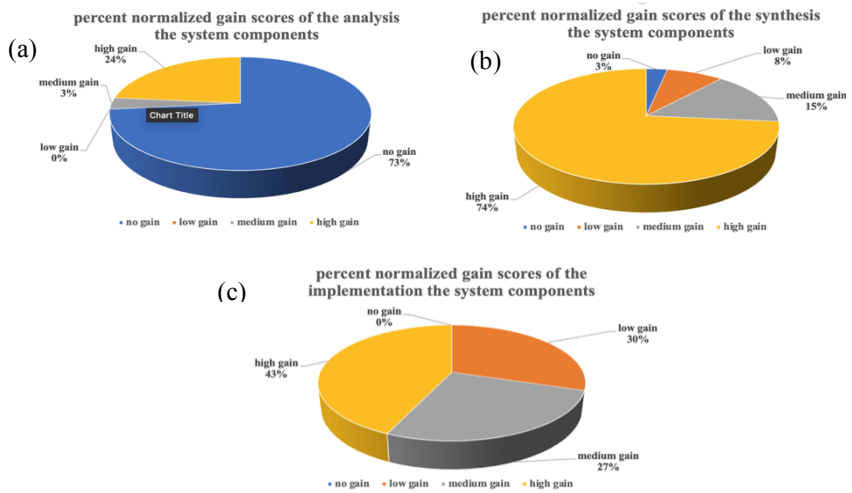

Figure 1: shows percent normalized gain scores of the system thinking test on buffer solution (a) in levels of analysis system components. (b) in level of synthesis the system components. (c) in level of implementation.

Result of System Thinking at The Level of Analysis of system components

For the analysis of system components, the overall result was that the mean score of the posttest (4.47±0.86) was significantly higher than that of the pretest (3.93±0.86) at a .05 level of confidence (see table 5). When considering the overall normalized gain scores from table 6, the normalized gain of the analysis of the component level was 0.25, which showed that students' performance slightly improved at this level of system thinking.

The reasons arose from the students' having prior knowledge of conjugate acid and conjugate base since they learned about the theory of the acid-base topic. The content could be applied to identify the component of the buffer system in the learning activity that made most students get high scores on the pretest, have a bit more on the posttest, and slightly improve at this level of system thinking. However, when considering normalized gain scores for each student from table 6, some students had a high gain at these levels. The result was also consistent with the student's self-evaluation questionnaire, in which students agreed to a high level that teaching with LEGO allowed them to specify the buffer solution's components (see table 7).

Result of system thinking at the level of Synthesis of system components

For the synthesis of system components, the result of the mean score of the posttest (4.67±0.75) was significantly higher than the mean score of the pretest (1.80±1.09) at a .05 level of confidence (see table 5). When considering overall normalized gain scores from table 6 the normalized gain of the synthesis of system component level was 0.89 which showed students' performance improved most at this level of system thinking. The reason behind this could be due to the fourth phase of model-based inquiry learning activity, which was creating models. Students used LEGO as a model tool to simulate systems for simulating the pH controlling process in an experiment as well as associated natural phenomena. In the fifth phase of the model-based inquiry learning activity, which was evaluating the model, students created a description of the model's principles and assessed it from the relationships of components that affect each other.

The results emphasized that the LEGO model was a learning tool that allowed students to see the interaction between each component in systems and virtualization that was more than macroscopic, which is submicroscopic (Taber & Akpan, 2016; González-Sánchez, Ortiz-Nieves, & Medina, 2014). Students were also able to organize the elements of a buffer system within a framework of relationships, and the results also corresponded to Hmelo-Silver, Jordan, Eberbach, & Sinha (2017) using the combination of conceptual representation with inquiry and model-base as a tool to allow students to have system thinking. However, considering normalized gain scores for each student from table 6, some students had a medium gain and one student had no gain at these levels.

The results were also consistent with the students' self-evaluation questionnaire, in which students agreed to a high level that teaching with LEGO allowed them to see the relationship of buffer components changing when acid or base was added, understand the buffer solution's operating principle, and could help students create a framework that depicted the link between the elements that changed in a system, such as a chemical equation (see table 7).

Result of system thinking at the level of implementation

In the implementation aspect, the overall mean score of the posttest (11.43±4.38) was significantly higher than the mean score of the pretest (4.77±2.13) at a .05 level of confidence (see table 5) with the exception of the ability to understand the hidden dimensions of the system, because students could show a substance that was a component in a buffer system by drawing the structure of the substance at the molecular level in item 2. That made them have a fairly high score in the pretest, but they could not use that molecule to represent a substance in a chemical reaction in item 5. However, students could do better on both items 2 and 5 after learning through model-based inquiry using LEGO. There was also evidence from the analysis of students' self-evaluation questionnaire, observations in class, and conversations with students, they agreed at a high level that LEGO lessons were able to assist them in comprehending the mechanism of action of buffer solutions at the molecular or atomic level. Considering the normalized gain scores from table 6, the normalized gain of the analysis of the component level was 0.61 which showed that students' performances were moderately improved at this level of system thinking.

The reason behind this finding could be due to the sixth phase of the model-based inquiry learning activity, which was revising the model and applying it in new situations. Students could illustrate the LEGO model to explain the particle model of components that relate to contouring pH, which gave students virtualization at the molecule level (Campbell et al., 2011). Then they were able to make generalizations, modify the model, and apply the model to other situations or contexts such as daily life, the environment, etc. However, this is the highest level of system thinking. Some students were unable to apply the model to explain the principal work of buffer solutions in other situations. Considering normalized gain scores for each student from table 6, some students had a low gain and some had a medium gain at these levels.

According to students who had learned through the model-based inquiry activity, used LEGO as a tool to represent pH contorting in a buffer system, and had taken the system thinking test on buffer solution, which was a scenario-based test using a graphical tool that relates to the implementation level of system thinking, the results of the pretest score and posttest score of students who had developed system thinking corresponded to (Assaraf & Orion, 2005) which used drawing as one of many tools to assess system thinking and also related to Ravi, et al. (2021) who were developing graphical tools for system thinking specifically in catalysis. The results were also consistent with the student self-evaluation questionnaire, which revealed that students strongly agreed that LEGO activities could help them understand the mechanism of action of buffer solutions at the molecular or atomic level, and that they could apply their buffering knowledge to real-world problems (see table 7).

Results of student’s self-evaluation questionnaire

The student’s self-evaluation questionnaire was used to give students an assessment of themselves after the implementation, and the data was then used to analyze the consistency with the experimental results of the pre-test and post-test. The results of the questionnaire analysis of the positive and negative questions by converting the calculations of the negative questions into positive ones are shown in table 7.

Table 7: Results of student's self-evaluation questionnaire

Items	Mean ± SD	Interpretation
1) Analysis of system components (Items 1-2)		
1. Teaching with LEGO allows me to specify the buffer solution's components.	4.17±1.24	High level
2. This LEGO instruction was unable to assist me in identifying the components of the buffer solution	4.17±1.19	High level
Overall	**4.17±1.21**	**High level**
2) Synthesis of system components (Items 3-6)		
3. LEGO taught me that if I add acids or bases to the buffer solution, the amount of substance in the solution will rise, as well as the compounds that are lowered.	4.17±1.21	High level
4. The LEGO tutorial allows me to illustrate the buffer solution's operating principle.	4.27±1.03	High level
5. The LEGO tutorial still didn't assist me to comprehend how buffer solutions affect pH.	4.30±1.04	High level
6. Using LEGOs as a teaching tool allows me to create a framework that depicts the link between the elements that change in a system, such as chemical equations.	4.00±1.06	High level
Overall	**4.18±1.09**	**High level**
3) Implementation (Items 7-9)		
7. Using LEGOs to teach lets me apply my buffering knowledge to real-life issues.	4.53±0.56	Very high level
8. I can visualize the notion of adjusting the pH of a buffer solution thanks to this LEGO instruction.	4.17±1.07	High level
9. At the molecular or atomic level, LEGO lessons are unable to assist me in comprehending the mechanism of action of buffer solutions.	4.33±1.01	High level
Overall	**4.34±0.88**	**High level**

Conclusions

From the results of a model-based inquiry activity that requires students to learn through 6 phases, which are: engaging with a question or problem, developing a tentative or hypotheses, making systematic observations to test hypotheses, creating models, evaluating the model, revising the model, and applying it in new situations, the average posttest score of system thinking in all levels on the buffer solution topic was significantly higher than the average pretest score, which was statistically different at the .05 level. Including the normalized gain scores of 3 levels of system thinking, which include analysis of components, synthesis of components, and implementation, are indicated at a low level, high level, and medium level, respectively, that can answer the research question, which is which model-based inquiry activity can promote system thinking of grade 11 students on the buffer solution topic. System thinking made the most progress in the level of synthesis due to students' using LEGO as a model tool to virtualize the components and relations between components in the system as submicroscopic (Taber & Akpan, 2016; (González-Sánchez, Ortiz-Nieves, & Medina, 2014) and students' ability to implement knowledge into the real-world issue. The result from the student's self-evaluation questionnaire found that all three levels of system thinking were high-level.

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Stakeholder Perceptions of Connecting ESP Courses With Graduation Seminar Topics

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The IAFOR International Conference on Education in Hawaii 2021
Official Conference Proceedings

Abstract
English as a global language and recent attention to the merits of the integration of language learning with knowledge/content construction has led to the necessity for the inclusion courses reflecting these ideals in tertiary educational programs including liberal arts. With this in mind, in the 2020 academic year, the presenters' university in Japan asked them to review the third-year content-based English classes and develop an ESP program that would enable students to study content related to their graduation seminar subjects in English. Fourteen content English courses divided into two categories were created: Comparative Cultural Studies and Intercultural Communication. Course topics include American Studies, British Studies, Japanese Studies, Children's Studies, Political Science, SDGs for International Cooperation, Gender, Race, Tourism, Economics, Organization Behavior, Cross-Cultural Management, Information Science, and SDGs for Business. Instructors with expertise in these areas were also hired and the new courses commenced in the 2021 academic year. This presentation reported on the progress of implementing the new courses, and discuss data obtained from students and professors in regard to the new courses. The preliminary results demonstrated that while 77 percent of the students surveyed felt a strong connection between the content studied in their English classes and their Graduation Seminar, the results from the Seminar professors and CBE Instructors surveyed indicated less of a perceived connection between the classes and the seminars. The issues surrounding these findings and plans for the next stage of the ESP curriculum project was elaborated upon.

Keywords: English for Specific Purposes (ESP), Learner Interest (LI), Curriculum Development

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Introduction

In the 2020 academic year, the authors' university tasked them with developing a set of English for specific purposes (ESP) courses that included both content and language instruction (Dudley-Evans and St. John, 1998; Hutchison, and Waters 1987; Basturkmen, 2006). The authors surveyed professors in their department and determined that graduation seminar course professors wanted their students to learn skills for engaging with the seminar content in English. Next, they reviewed currently offered courses and determined that the content-based English (CBE) courses, which were required elective classes for third year students, would be suitable for the new ESP program. They set about renaming the courses to align with seminar topics and designed fourteen courses with the following titles: Comparative Cultural Studies and Intercultural Communication. Course topics include American Studies, British Studies, Japanese Studies, Children's Studies, Political Science, SDGs for International Cooperation, Gender, Race, Tourism, Economics, Organization Behavior, Cross-Cultural Management, Information Science, and SDGs for Business. Then the authors surveyed current English skills instructors about their expertise and ability to teach the new courses. Several instructors possessed knowledge in some of the ESP topics and showed interest in teaching the new courses. Other content specialists were hired to teach the courses that could not be taught by instructors who were currently employed at their university. The courses were also moved to Fridays, when the seminar courses are taught, so that ESP and seminar professors would find it easier to discuss the content of the new courses. Instruction of the new ESP courses began in the 2021 academic year. This paper will detail the progress of implementing the new courses and data from a survey administered to both students taking the courses and instructors after the first semester of instruction.

Establishing the New ESP Courses

Several years ago, the authors' university created "B's Vision," which aims to motivate students and help them improve their practical English skills as they develop the skills to communicate in English in a variety of situations related to their academic and future career interests. B's Vision included B's Vision Communication. The concept of B's Vision Communication is to eventually develop a Communication Masters Series that will encompass English for general purposes (EGP), English for business purposes (ESP), English for academic purposes (EAP), ESP, and English communication for sustainable development goals (SDGs). Then in April 2020, a General English Committee was established partially with the goal of working toward the implementation of B's Vision.

Within the General English Committee, a subcommittee tasked with creating ESP courses was established. The subcommittee, dubbed the ESP Team, consisted of four professors consisting of the ESP/Content and language integrated learning (CLIL) and EAP specialists, a member of the International Liberal Arts program, and a member of the International Business program. After discussing options for creating the new ESP courses, the ESP Team decided the best path forward would be to begin with ESP courses for third-year students then once those were established, they would begin working on developing ESP courses for first and second year students, which will eventually become one of the cornerstones of B's Vision Communication. The team decided the smoothest method for introducing ESP courses would be to connect the third year CBE courses with the graduation seminar topics that are taught in Japanese. They surveyed the graduation seminar instructors, who are not English teachers, about the kinds of English skills they wanted their students to learn, and many of the seminar instructors indicated that they wanted their students to be able to communicate in

English about the topics they study in their seminar classes. Next, the ESP Team researched options for adding new courses to the curriculum as well as changing the content of currently offered courses. Eventually, the team determined that adding entirely new classes to the current curriculum would entail a tremendous amount of time and paperwork to get approval. Changing the names and content of current courses was much easier though. Thus, introducing ESP related to the seminar topics in the CBE courses was the logical choice because the existing CBE courses could simply be renamed, and the content changed to align with the content taught in the seminar classes (Guo, 2012).

Once the English needs were determined and the decision was made to revamp the currently offered CBE courses, the ESP Team began creating new courses that covered topics related to the seminar content. The courses were also divided into lower and higher levels based on the third grade students' English levels, which would allow the students to study the authentic content at a language level suitable for their current English language skills.

In order to promote success in the incorporation of these classes, the ESP Team felt it was important to encourage communication and collaboration between the ESP and seminar professors as this is considered instrumental (Coffey, 1985,Lorenzo, 2005). Thus, the ESP Team applied for and received approval to reschedule the CBE/ESP classes so they would correspond with the seminar class day. The rationale for holding both classes on the same day was to help create a sense of 'parallel with experience'(Belcher, 2013) for the students. The team felt that holding the classes on the same day would enable students to learn content related to their seminars in English as well as their seminar topic on the same day, which would reinforce both the language and content they were being taught. They also theorized holding the classes on the same day would motivate students to learn English because they would be able to connect content being taught in Japanese with their new English skills from the CBE courses. Since most of the ESP teachers are part-time, having them on campus on the same day as the seminar professors, would also provide more opportunities for the professors to meet, discuss seminar and ESP topics, and collaborate to provide better content and language instruction in the new ESP courses.

Implementing the new Program

The new ESP courses began in April 2020. Students are required to take one ESP course each semester in their third year, so they were placed into one course based on their seminar topic and another course covering a topic of their choice. Because the courses as well as most of the instructors were new, the ESP coordinator advised the new teachers about planning, class activities, and other aspects of teaching the courses such as uploading the syllabi to the university's website, grading, and textbooks or materials choices.

Stakeholders Feedback

Upon completion of the first semester, the coordinator surveyed the students, ESP instructors, and seminar professors to do a progress check, learn their impressions of the new courses, and determine whether any changes needed to be made to the courses in the second semester. With an overall response rate of 80% a total of 115 students, ten ESP instructors, and seventeen seminar professors responded to the survey. Two sections of the questionnaires were highlighted: firstly, the link between ESP classes and seminars, and secondly the perceived usefulness of the ESP classes for Seminar study. 77% of the students reported they felt ESP and seminar classes were related, and 72% reported that they perceived the

knowledge gained from ESP classes as useful in their respective seminar classes. Students comments reinforced these findings with students comments such as:

"The link between the content in my CBE class and my seminar was very clear and I think it helped me a lot" (Student A).

"Learning a different point of view about the US from my CBE Instructor helped me to make an opinion in my Seminar class discussion" (Student B).

In response to the same questions, 50% of the ESP instructors and 29% of the seminar professors reported that they perceived the content in ESP classes to be related to the seminar classes. With regard to the usefulness of the knowledge gained from ESP classes in seminar classes, 30% of ESP instructors and 35% of seminar professors reported that they perceived the knowledge gained from the ESP classes was useful in the seminar classes. Comments from ESP instructors eluded to a lack of communication and feedback from seminar professors though as can be seen in the following comments:

"I would like to receive at least some feedback on my syllabus from the seminar professor" (ESP Instructor A).

"It would be great if we could have a meeting with the seminar professors so I could double check my teaching focus" (ESP Instructor B).

These findings perhaps illustrate not only a lack of communication between the seminar professors and ESP instructors but also between these two stakeholder groups and the students. Perhaps the lack of communication was due to the ongoing coronavirus situation and the fact that university policy was to teach one-third of the semester at school with the rest of the courses being taught online as commented by both these stakeholder groups:

"I think that it was rather difficult with the classes being online hyflex classes to meet the ZEMI Profs" (ESP Instructor A).

"I would like to get to know the CBE Instructors but with COVID-19 often our schedules don't match. I look forward to being able to talk after things become semi-normal again" (Seminar Professor A).

Since the seminar professors and ESP instructors were not at school every week, and possibly not at school on the same weeks, they might not have had opportunities to meet and discuss the courses. The difficulty in finding opportunities to communicate can be seen in comments from both the ESP and seminar professors that demonstrate it is an important issue that will need to be continually addressed as the pandemic continues. As Initially, there was a plan to create an ESP corner in the teachers' lounge where ESP and seminar topic materials could be housed and ESP instructors and seminar professors could meet. Because of the ongoing coronavirus situation and uncertainty about the university's policies regarding instruction in the 2022 academic year, establishing the ESP corner has been put on hold though. The authors continue to feel that communication between the stakeholder instructors is vital for the program's success and will work to find better avenues of communication for the upcoming academic year.

Conclusions

With one full year of the new ESP classes completed, the most apparent conclusion is that there is still a lack of communication among all of the stakeholders. These findings perhaps illustrate not only a lack of communication between the seminar professors and ESP instructors but also between these two stakeholder groups and the students. Addressing the communication issue is important as this program continues because the purpose of the new classes is to motivate students as well as to provide them with English skills to engage with the content learned in Japanese in their seminar classes. Furthermore, although workshops and a symposium were held to educate faculty members about the new classes before they began, it appears there is still a lack of understanding of the concepts of ESP on the part of the seminar professors and perhaps a lack of confidence on the part of the ESP Instructors. Facilities such as the development of an ESP corner, either a virtual or physical, will continue to be investigated as both seminar professors and ESP instructors have indicated that they would like the opportunity to have more contact with each other in order to enhance their understanding of ESP, align the content of the seminar and ESP courses, and develop more confidence in providing suitable ESP content that will further motivate students to learn about their seminar topics in English.

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