

Charting Sustainable Pathways: Understanding Private and Public State Universities' Role in Generation Z's Study Abroad Choices Through MCDA and SEM-ANN

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Abstract

This study examines how sustainability influences Generation Z's choices in study abroad programs, including Student Exchange, Work and Study, and Language Immersion Programs. Using Multi-Criteria Decision Analysis (MCDA) and the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS), researchers evaluated factors like program duration, specialization, cost, financial aid, research opportunities, and quality. The Theory of Planned Behavior (TPB) was applied to understand how these sustainability factors affect decisions. Structural Equation Modeling (SEM) revealed relationships among ten variables, including Perceived Benefits (PB), Perceived Cost (PC), Perceived Risk (PR), Perceived Trust (PT), Attitude (A), Subjective Norms (SN), Perceived Behavioral Control (PBC), Awareness of Service (AOS), Intention (IN), and Behavior (B). An artificial neural network (ANN) enhanced the accuracy of identifying key sustainability factors. Data from 320 respondents via 60 surveys indicated that sustainability significantly influences study abroad decisions, with Perceived Behavioral Control (PBC) having the strongest impact, followed by intention and attitude. Perceived Benefits (PB), Perceived Risk (PR), Perceived Trust (PT), and Awareness of Service (AOS) were crucial in shaping intentions. Subjective Norms (SN) indirectly influenced decisions. Student Exchange Programs were the preferred choice due to perceived sustainability benefits. This study provides insights for educational institutions and policymakers better to align programs with Gen Z's sustainability goals.

Keywords: Study Abroad Decision-Making, Generation Z, SEM, MCDA, ANN

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Introduction

The international workforce demands globally proficient individuals (G20, 2011). Abroad programs are one of the various steps that aid students in developing their expertise in the global field (Pruitt, 2021). It has been shown that there has been a significant advancement in the number of students opting to study internationally over the past three decades (Granato et al., 2024). Relevant research has been focusing on elements that influence their decision-making process and shape their engagement in abroad programs to enhance experiences, thus improving the rate of students' participation (Cebolla-Boado et al., 2018). For instance, a study by Wang and Crawford (2020) that focuses on the decision-making process of Chinese students who study abroad illustrated that male students from a lower socioeconomic background were more interested in selecting their destination based on what benefits it would offer in terms of their socioeconomic status. In contrast, younger students rely more likely on subjective recommendations of their circle (Wang & Crawford, 2020). In other studies, factors that impact students' intention to study abroad are immigration opportunities (King & Sondhi, 2017) research opportunities (Delicado, 2010; Ahmad et al., 2010), and their overall experience abroad (Delicado, 2010). Furthermore, status and career upgrades also significantly affect their decisions in international studies (Ahmad et al., 2010). Previous studies, which were cited in a study by Li et al., illustrated that South Korean students opted for master's or doctoral degrees offered by American elite universities for them to have a global competitive edge and cultural capital, Hongkong students going abroad to study to enhance their advances in the labor market, and Chinese students find that gaining learning experience from international universities are perceived as a motivator towards their future careers' success (L. Li et al., 2021). Hence, several institutions have enhanced their program plans abroad and expanded their programs by offering scholarships, focusing on their marketing strategies to increase the higher education students' participation rate (Pruitt, 2021). However, as time evolves, the context of factors that shape their decisions may have significantly changed. This calls for ongoing research to adapt and provide relevant research, ensuring educational institutions and policymakers can accurately design and plan their academic programs (Cheng & Agyeiwaah, 2022).

The Filipino student market for international education is one of the largest and fastest growing in Southeast Asia, driven mainly by students seeking postgraduate degrees. With around 49,000 Filipino students currently studying abroad, this market is expected to grow by 13% annually over the next five years (Tolentino, 2023) China has emerged as a critical partner, actively fostering educational ties with the Philippines over the past two decades. China supports Filipino students to study in the country and facilitates their return to continue their education, reflecting a solid commitment to enhancing cooperation in the educational sector between the two nations. According to Jose Miguel Habana, country director of IDP Philippines, the number of Filipino students studying abroad is expected to grow by 8-10% annually in the coming years due to increasing interest in overseas learning and the perception that it provides opportunities to find work and potentially migrate to more developed countries after completing their education. Many Filipino students are also drawn by the higher quality of education in destination countries and the availability of specific courses that may not be offered in the Philippines (Delaney, 2019). This study aims to determine the factors influencing Filipino students' decisions to study abroad.

The study addresses gaps in the existing literature on Generation Z's decision-making regarding study abroad, specifically in choosing between private and public state universities and colleges (SUCs). While some studies have explored factors such as students' ability,

student development, academic engagement, community/civic engagement (Stebbleton et al., 2013). political standpoint and worldview (Siddiqui, K., 2013), personal experiences, social experiences, and educational experiences (Pruitt, 2021). influencing study abroad decisions among a broader participant pool, the researchers recognized the limited focus on Gen Z students. This study thus narrows its scope to investigate the unique decision-making processes of Generation Z in international education. Incorporating the Theory of Planned Behavior (TPB) with additional variables such as perceived cost, perceived risk, perceived benefits, and perceived trust distinguishes this research from previous works. By utilizing multi-criteria decision analysis (MCDA), structural equation modeling (SEM), and artificial neural networks (ANN), the study aspires to provide a more comprehensive understanding of the intricate factors shaping the study abroad decisions of Generation Z students, shedding light on the distinctions between private and public SUCs in this decision-making process.

This study aims to underscore the factors shaping Generation Z's decision-making process in selecting abroad programs among students from private and public state universities and colleges (SUCs). Multi-criteria decision Analysis (MCDA) seeks to determine the criterion that affects the perceived overall quality of programs abroad: The Student Exchange Program, Work and Study Program, and Language Immersion Program. In addition, this study will also explore various variables to understand their role in shaping and influencing the behavior of Gen Z in international studies. Through SEM-ANN, this will shed light on the most critical factors that affect their decision to study. Thus, this study mainly intends to explore and develop insights into how private and public SUCs can entice and improve to make Gen Z students commit to a particular institution. In addition, this also aims to provide relevant research on the decision-making process of Generation Z students that will aid in the planning of abroad programs at various institutions.

The outcomes of this research not only enhance our comprehension of the preferences of Generation Z but also carry practical implications for educational institutions and policymakers. These findings can guide them in customizing study abroad programs to better align with the needs of this generation, fostering more enriching international learning experiences. Furthermore, the study provides a strategic approach for private and public state universities and colleges to boost their competitiveness and attract Generation Z students to participate in overseas education. By assisting educational institutions in refining their programs and services to align with the preferences of Generation Z students, this research aims to contribute valuable insights. The study offers practical recommendations to address the identified research gap and build upon related studies.

Methodology

Participants

Studies incorporating Structural Equation Modeling (SEM) with ten to fifteen variables require a population size of at least 200 (Siddiqui, 2013; Jou et. al. 2022). The 60-component questionnaires were sent to 320 participants from the Net Generation, or Gen Z, via an online platform and face-to-face survey. In addition, the current study applied stratified random sampling, where the researchers divided the sample size of students from public and private state universities and colleges residing in Occidental Mindoro.

Structural Equation Modeling

Structural Equation Modeling (SEM) is a method that uses statistics to analyze the correlation of several variables presented (Hair, 2010; Ouyang et al., 2018; Li et al., 2020; Ong et al., 2023). Thus, SEM is often preferred to implement because it can model observed and latent constructs in a single framework (Kline, 2015; Ang & Lau, 2024). SEM will analyze multiple variables, namely Perceived cost, Perceived risk, Attitude, Perceived benefits, Perceived behavioral control, Subjective norms, Intention, Awareness of service, Perceived trust, and Behavior. In this study, SEM tested ten latent variables, such as Perceived Benefits (PB), Perceived Cost (PC), Perceived Risk (PR), Perceived Trust (PT), Attitude (A), Subjective Norms (SN), Perceived Behavioral Control (PBC), Awareness of Service (AOS), Intention (IN), and Behavior (B). The IBM SPSS AMOS software version 26 was used to analyze the initial to final SEM model data. Moreover, the software was also used to see the model reliability through the Cronbach alpha, estimates, and the Goodness of Fit.

Artificial Neural Network

Artificial neural networks (ANNs) are adept at addressing complex, uncertain, nonlinear, multifaceted, and stochastic problems. The structure of an ANN, as described in the Principles of Artificial Neural Networks (3rd Edition), meticulously specifies the layers, activation functions, and neuron arrangements. Various studies, such as those conducted by (Saritaş & Yaşar, 2019) have explored using ANNs for understanding and predicting global human behavior. Assessing the performance of an ANN model requires a careful selection of evaluation metrics and validation techniques to comprehensively measure its efficacy. In the present study, recognizing the limitations of linear methods like Structural Equation Modeling (SEM), the researchers opted for ANNs implemented through SPSS (Fan et al., 2016). They initiated an optimization process to identify the optimal activation functions, node quantities, optimizer, and training/testing ratios, facilitating a detailed analysis that captures nonlinear relationships within the dataset.

Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS)

The Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) was introduced in the 1980s as one of the approaches that can be used as a multi-criteria decision analysis approach (Hwang & Yoon, 1981). TOPSIS can identify the most preferred alternative by a specific population based on the distances from given alternatives and the ideal solution (Madanchian & Taherdoost, 2023). In this study, several criteria are incorporated: program duration, specialization, perceived cost, financial support, research opportunities, and program quality. Programs such as the Student Exchange Program, Work and Study Program, and Language Immersion Program are the following alternatives integrated in this study, based on the Gen Z's from public and private SUCs.

Results and Discussion

SEM-ANN Results

Figure 1 presents the ANN model considered in this study. It shows that the variables are interconnected to each other, which is similar to the SEM results with a p-value of >0.05 , which shows PC, PR, PT, PB, A, SN, PBC, AOS, and IN were considered the input nodes for the ANN which represents the correlation to behavior. The final result of the ANN model

shows that the most critical factor is PBC, followed by IU, A, SN, PT, PB, PR, AOS, and PC. However, despite yielding comparable outcomes, the study highlights the significant influence of the indirect effect of SEM on its results, underscoring its importance alongside ANN (Blunch, 2013; Onyelowe et al., 2023; Praveen et al., 2020). Hence, the importance of the independent variable is showcased in Figure 4 confirming the consistency of results between both models. This underscores the significance of the finding, as validated by the hybrid SEM-ANN approach.

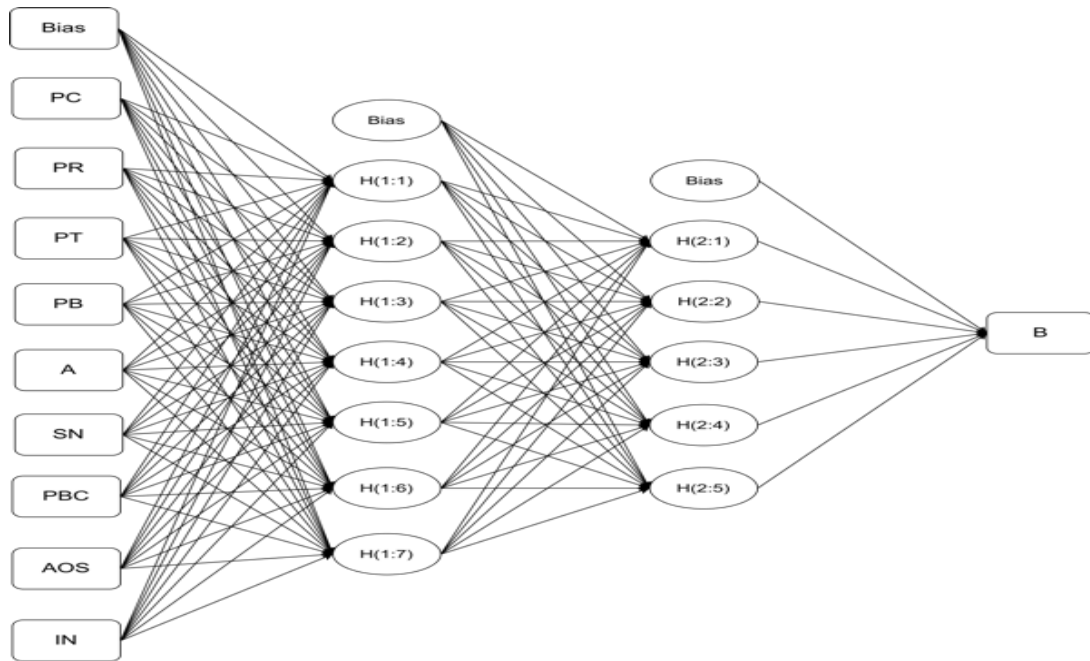


Figure 1: Artificial Neural Network Model

TOPSIS Result

The Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS) is a well-known multiple criteria decision analysis method. Its function is to identify the best alternative that is nearest to the positive ideal solution and farthest from the negative ideal solution. TOPSIS is integrated to explore the generation's decision-making regarding studying abroad of the three educational program alternatives based on public and private school preferences. The three alternatives evaluated are the Student Exchange Program, the Work and Study Program, and the Language Immersion Program. Result shows that in Public and Private, the most preferred alternative is Student Exchange Program, while the least is Language Immersion Program.

Conclusion

This comprehensive study investigated the factors shaping Generation Z students' decision-making process regarding study abroad program selection at both private and public state universities and colleges (SUCs) in Occidental Mindoro. By integrating a multi-pronged approach encompassing Structural Equation Modeling (SEM), Artificial Neural Networks (ANN), and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), the research offers valuable insights into the unique priorities and decision-making patterns of this emerging student cohort.

This study revealed that perceived benefits significantly impact intention, followed by perceived risk, trust, and service awareness. Moreover, subjective norms don't significantly impact the intention, which contrasts with other literature studies. The ANN models further validated the SEM results, identifying perceived behavioral control as the most influential predictor, followed by intention to use, and attitude. The TOPSIS analysis provided a ranking of the three study abroad program alternatives - student exchange, work and study, and language immersion - based on factors such as program duration, specialization, perceived cost, financial support, research opportunities, and program quality. The study abroad program's ranking shows that the language immersion program has the lowest ranking, and the student exchange program is the highest. This holistic assessment offers valuable insights for educational institutions to optimize their international education portfolios.

These multifaceted findings carry significant practical implications. By understanding the nuanced priorities and decision drivers of Generation Z, universities can tailor their study abroad programs to better align with the needs and expectations of this critical student segment. This, in turn, can help boost participation rates in international education and foster more enriching global learning experiences. Moreover, the strategic framework developed in this research provides a roadmap for both private and public SUCs to enhance their competitiveness in attracting Generation Z students to engage in overseas studies.

Overall, this study contributes to the evolving literature on study abroad decision-making, offering a comprehensive perspective on the factors shaping the international education choices of the next generation of students. The integration of SEM, ANN, and TOPSIS techniques provides a robust and holistic analytical approach that can be replicated in future research to yield valuable insights for educational institutions and policymakers alike.

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