Proceedings of the International Conference on Industrial Engineering and Operations Management

Publisher: IEOM Society International, USA DOI: 10.46254/AF6.20250109
Published: April 8, 2025

Analysis of Generation Z Filipinos' Perception of AI Using Multiple Regression

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Abstract

Artificial Intelligence (AI) technologies, such as robots, computer vision, natural language processing, machine learning, and more, have the potential to completely transform education by offering automated grading, intelligent mentoring, individualized learning, and more. Despite its benefits, the integration of artificial intelligence (AI) in Philippine education is challenged with significant obstacles such as cultural taboos, limits in digital infrastructure, and expensive internet expenses. The Unified Theory of Acceptance and Use of Technology (UTAUT 2) was utilized in this study to determine the factors that have significant effects on Generation Z's perceived behavioral intention to use text generative artificial intelligence in the Philippines. Ethical consideration was also added to assess how they affect perceived risk and attitude on how they perceive their behavioral intention. Multiple regression was done for the data analysis with the use of Minitab. It was determined that the factors Effort Expectancy (EE), Performance Expectancy (PE), Facilitating Conditions (FC), Hedonic Motivation (HM), Habit (HB), Ethical Considerations (EC), Perceived Risk (PR), Attitude (ATT), Region, and Gender all significantly affect how Generation Z utilizes text-generative artificial intelligence. These findings serve as a better understanding of how these factors influence the PBI of students in utilizing text generative artificial intelligence.

Keywords

Text Generative Artificial Intelligence, Education, Generation Z, Unified Theory of Acceptance and Use of Technology and Multiple Regression.

1. Introduction

Artificial Intelligence (AI) is the simulation of human intelligence in machines programmed to think and act like humans (Dong et al. 2020). This study differs from existing literature in that it looks specifically at the behavioral intentions of Filipino Gen Z students with the use of text-generative AI in education. The literature focused on a general analysis of AI adoption, this article examines explicitly a quantitative approach using multiple regression testing the Unified Theory of Acceptance and Use of Technology (UTAUT 2) (Abril 2023). In contrast to qualitative discussions that generally emphasize the benefits and risks for AI, this study statistically uncovers significant predictors and determinants that influence Gen Z's view of AI, leading to a more structured and data-informed analysis. Furthermore, while global studies investigate the integration of AI in differing educational contexts, this study provides a localized perspective, investigating the specific challenges and opportunities present within the Philippine education system, which is confronting an underdeveloped policy framework around AI usage (Chi 2023). According to a recent study by Instructure, about 83% of Filipino students use generative artificial intelligence in research and writing, 52% for test preparation, and 47% for foreign language learning, showing the proliferation of AI tools in the academic setting.

In addition to its methodological uniqueness, this research has notable real-world implications. This can help educators and policymakers understand the adoption of AI in Filipino students' writing, research, test preparation, and language learning, and better shape AI-driven education (Estrellado and Miranda 2023). Such understanding may help inform national AI guidelines focused on ensuring that the inclusion of AI in education facilitates learning without compromising ethical standards. Additionally, amidst worries over the potential for AI to be abused and the lack of a fair evaluation of AI-produced work, this study also highlights the importance of academic integrity frameworks that could address and guide academic AI use in the classroom (Caratiquit and Caratiquit 2023). It can also help both technology developers and educators design more effective digital tools that will suit students exactly by understanding what drives or hinders the adoption of AI. Finally, the insights from the study can aid the implementation of digital literacy programs to equip students with the skills needed to engage with AI tools responsibly and effectively (Ngo 2023). Such efforts fulfill not just a scholarly gap but also hold significance in steering the future direction of AI in Philippine education.

1.1. Objectives

This study aims to statistically identify relevant factors affecting the perceived behavioral intention of Filipino Gen Zs in utilizing text-generative artificial intelligence in education through multiple regression, integrating the Unified Theory of Acceptance and Use of Technology (UTAUT 2).

Specifically, the study aims to:

1. Examine how text-generative artificial intelligence is perceived in the Philippines by exploring existing literature on how Gen Zs utilize such technologies.
2. Evaluate the factors that influence the behavioral intention of Filipino gen Zs in using text-generative artificial intelligence in education to understand their perception of these technologies.
3. Recognize which factors significantly affect the perceived behavioral intention of gen Zs using Multiple regression.
4. Contribute to a deeper understanding of the text-generative artificial intelligence student perception in the educational sector in the Philippines through the findings of this study.
5. Provide insights to enhance students' perception in effectively utilizing text-generative artificial intelligence tools in education in the country.

2. Literature Review

Generation Z, born in the 1990s and raised in the 2000s, is a generation living in a world dominated by the internet, smartphones, laptops, and digital media, undergoing profound changes in the century (Singh and Dangmei 2016; Szymkowiak et al., 2021). Recent advances in Artificial Intelligence, particularly in the field of the generative pre-trained transformer (GPT) large language models (LLM), have led to the development of various publicly accessible online text-generation tools (Dergaa et al. 2023). Notable text generative tools are ChatGPT, a general-purpose chatbot

tool created by OpenAI; Gemini (formerly known as Bard) developed by Google; Grammarly, widely known as an editing tool for written content but also a generative tool; and GPT-4 (Fitria 2021; Law 2024). Gen Z individuals plan to utilize GenAI for acquiring information, learning language, and writing support, showing their esteem for technology in improving their learning experiences (Hernandez-de-Menéndez et al. 2020).

In the educational sector, Gen Z learners need interactive learning experiences relevant to their real lives and prefer learning using technology (Zulfikasari et al. 2024). Gen Z participants are optimistic about GenAI's benefits in higher education, such as boosting productivity, efficiency, and personalized learning (Singh and Dangmei 2016). However, as per Burkhard (2022), students have varying perspectives on AI-powered writing tools, as some may use them carelessly, while others may not utilize them at all due to skepticism. Accordingly, UNESCO calls for governments to regulate the use of Generative Artificial Intelligence in education; hence, they released guidelines for policymakers to help them make the most of the opportunities that Artificial Intelligence presents and address ethical concerns (UNESCO 2023).

In the Philippines, challenges regarding learning and teaching materials (LTM) have been a prominent problem in the public education system, while undue access to LTM-related issues include problematic procurement processes, a low number of publishers, high cost, and suppliers being unable to finish printing on time; thus, teachers show concerns about LTM availability which would result to poor learning outcomes (Magallanes et al. 2022; Tomas et al. 2021). The proper engagement of higher education institutions with Generation Z is crucial for academics, professors, and university staff to understand their characteristics. This understanding will enable Gen AI technology's ethical and effective integration into the curriculum. (Chan and Lee 2023; Shorey et al. 2023).

However, Dalan (2023) stated that even though the Philippines' population has become more tech-savvy, and its digital infrastructure has improved, there is still a lack of concrete evidence on the effectiveness of AI-driven language learning programs created particularly for Philippine educational institutions. It was suggested by Valerio (2024) to involve changes in student perceptions and ethical concerns over time as artificial intelligence becomes increasingly integrated in educational settings. This approach could provide valuable insights into how prolonged interaction with artificial intelligence impacts attitudes and acceptance of students. In fact, this study will be the first to look into how generation Z perceives their own behavioral intentions in using artificial intelligence.

The literature also focuses on the factors affecting how Generation Z perceives their behavioral intention. Three constructs – price value, habit, and hedonic motivation are incorporated into UTAUT 2 from UTAUT. The impacts of these elements on behavioral intention and technology use are controlled by individual differences such as name, age, gender, and experience (Venkatesh et al. 2012). Recent studies have highlighted the significance of incorporating UTAUT 2 in determining the factors that influence users' behavioral intention (Gharrah and Aljaafreh 2021; Arain et al. 2019). Acknowledging these numerous factors is important as it presents the framework for advancing artificial intelligence and its successful integration into education.

3. Methods

The researchers identified the problem, which was applied as the foundation of an extensive literature review. This is crucial as it provides the information needed to finalize the topic and to reduce the focus to a specific area of interest. In the process, research gaps were determined, highlighting areas for exploration. The Unified Theory of Acceptance and Use of Technology (UTAUT2) was adopted to establish a solid framework for the study, which served as the basis and guide relevant to the study. In methodology, survey questionnaires served as the primary tool in data collection. Constructed questionnaires have undergone validation to assess their suitability as a measurement tool. Then, the researchers conducted sampling and data gathering. From the gathered data, the researchers determined whether the model used was acceptable. If the model fitness is unacceptable, the researchers reviewed the data collection process; otherwise, they proceeded with multiple regression analysis using Minitab-19 statistical software. Lastly, the researchers developed their conclusions and recommendations according to their findings.

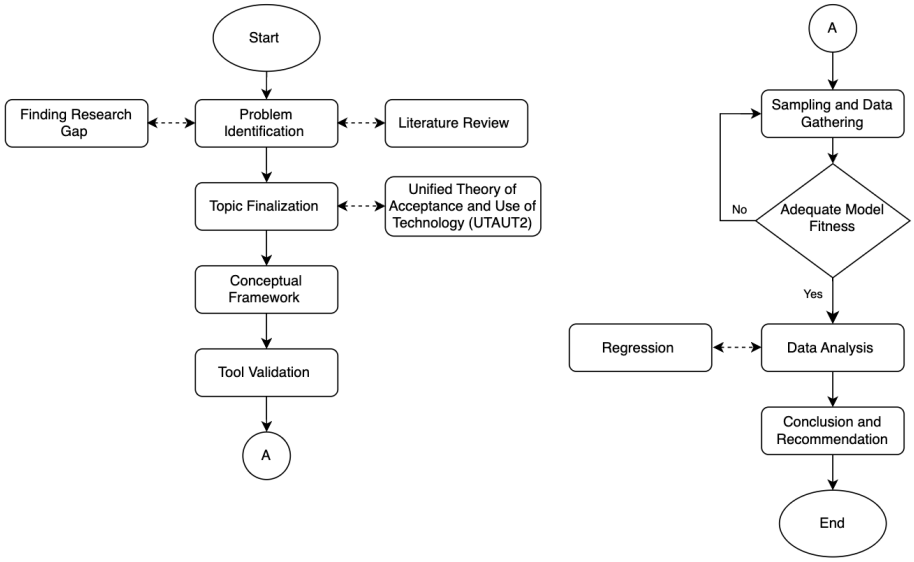

Figure 1. Data Gathering Procedure

4. Data Collection

This study focused on Generation Z learners, a demographic group born between 1997 and 2012. As digital natives, this generation has grown up in an era of rapid technological advancements and widespread internet access, shaping their perspectives and behaviors. The criteria for qualified respondents were their age, residence within the Philippines, highest educational attainment, and the text-generative artificial intelligence they use frequently. Table 1 shows the results of the respondents' demographics. The majority of the participants are aged 20-23 years old, with a percentage of 75.61%. Most respondents were females, 61.23%, while male respondents have a percentage of 38.77%. Additionally, the majority of the students belonged to the college undergraduate group, making up 67.69% of the total.

Table 1. Respondents' Demographics (N = 691)

Characteristics	Category	n	%
Age	12 - 15 years old	17	2.75%
	16 - 19 years old	85	13.73%
	20 - 23 years old	468	75.61%
	24 - 27 years old	49	7.92%
Biological Sex	Male	240	38.77%
	Female	379	61.23%
Region	Region I - Ilocos Region	31	5.01%
	Region II - Cagayan Valley	22	3.55%
	Region III - Central Luzon	66	10.66%
	Region IV -A - CALABARZON	93	15.02%
	MIMAROPA Region	19	3.07%
	Region V - Bicol Region	39	6.30%
	Region VI - Western Visayas	50	8.08%
	Region VII - Central Visayas	51	8.24%
	Region VIII - Eastern Visayas	29	4.68%
	Region IX - Zamboanga Peninsula	14	2.26%
	Region X - Northern Mindanao	32	5.17%
	Region XI - Davao Region	29	4.88%
	Region XII - SOCCSKSARGEN	19	3.07%
	Region XIII - Caraga	8	1.29%

	NCR - National Capital Region	99	15.99%
	CAR - Cordillera Administrative Region	10	1.62%
	BARMM - Bangsamoro Autonomous Region in Muslim Mindanao	8	1.29%
Highest Educational Attainment	Elementary	0	0%
	Junior High School	15	2.42%
	Senior High School	128	20.68%
	College Undergraduate	419	67.69%
	College Graduate	56	9.05%
	Master's Degree Holder	0	0%
	Doctorate Degree Holder	1	0.16%
Text Generative Artificial Intelligence	ChatGPT	301	48.63%
	Quillbot	86	13.89%
	Grammarly	181	29.24%
	Gemini (Google Bard)	34	5.49%
	Humata	0	0%
	Bypass AI	1	0.16%
	Others	17	2.58%

5. Results and Discussion

Minitab-19 software was used to determine the relationships between variables that affect how Filipino Generation Z perceives their behavioral intention toward text-generative artificial intelligence. The factors were evaluated using multiple regression analysis to determine which factors were statistically significant.

5.1 Numerical Results

S	R-sq	R-sq(adj)	PRESS	R-sq(pred)	AICc	BIC
0.0989919	97.53%	95.87%	5.24902	93.41%	- 20.79	
					312.55	

Figure 2. Minitab Results - Model Summary

Figure 2 represents the model summary of Minitab results, indicating its fits and predictive capability. The model's standard error of estimate is 0.0989919. The adjusted R-square value is 95.87%, indicating model fitness. According to Ozili (2022), the acceptable range for social science studies must meet the minimum threshold of at least 10% to determine the model's validity. This means the R-square value of 97.53% is within the acceptable range. In addition, the R-square value decreased by 1.66% from the R-square (adj) value, which is determined by other factors that are not examined (Kurata et al. 2022; Kurata and Matias 2017). The predicted error sum of squares is 5.24902, and the predicted R squared has a value of 93.41%. The corrected Akaike Information Criterion is 312.55, demonstrating a balance between model fit and complexity. The model's AICc and BIC metrics contribute useful benchmarks for comparison to alternative models.

Source	DF	Seq SS	Contribution	Adj SS	Adj MS	F-Value	P-Value
Regression	135	77.7041	97.53%	77.7041	0.575586	58.74	0.000
EE AVE	15	22.1665	27.82%	2.8807	0.192043	19.60	0.000
PE AVE	16	4.4916	5.64%	2.5653	0.160328	16.36	0.000
Region	16	9.8815	12.40%	8.0123	0.500766	51.10	0.000
Gender	1	0.0759	0.10%	0.2382	0.238243	24.31	0.000
FC AVE	13	4.2480	5.33%	2.7274	0.209801	21.41	0.000
HM AVE	21	14.0220	17.60%	5.6117	0.267222	27.27	0.000
HB AVE	16	10.5068	13.19%	7.9043	0.494021	50.41	0.000
EC AVE	10	2.3360	2.93%	3.3131	0.331313	33.81	0.000
PR AVE	14	4.9387	6.20%	3.7788	0.269911	27.54	0.000
ATT AVE	13	5.0371	6.32%	5.0371	0.387470	39.54	0.000
Error	201	1.9697	2.47%	1.9697	0.009799		
Total	336	79.6737	100.00%				

Figure 3. Minitab Results - Analysis of Variance

Figure 3 shows the analysis of variance in which the regression model significantly explains a substantial portion of the variance total in the data, which is 97.53%. According to Dahiru (2008), a factor is considered statistically significant if its p-value is less than 0.05 ($p < 0.05$). This indicates that factors like Effort Expectancy (p-value = 0.000), Region (p-value = 0.000), Gender (p-value = 0.000), Facilitating Conditions (p-value = 0.000), Hedonic Motivation (p-value = 0.000), and Habit (p-value = 0.000), Ethical Considerations (p-value = 0.000), Perceived Risks (p-value = 0.000), and Attitude (p-value = 0.000) have significant influence to Filipino Gen Zs' perceived behavioral intention in utilizing text-generative artificial intelligence.

5.2 Graphical Results

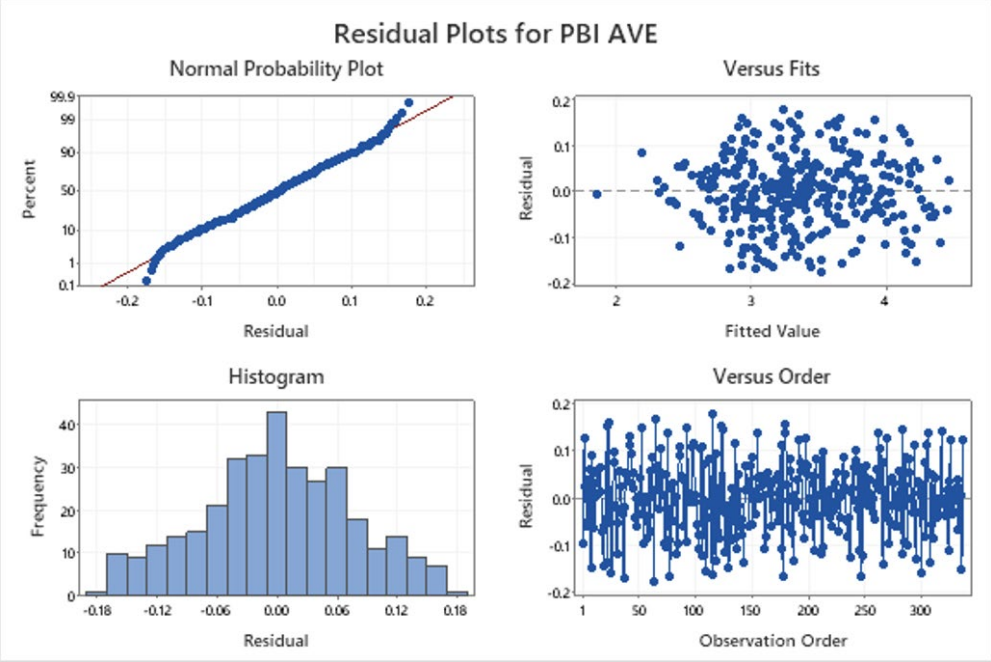

Figure 4. Normal probability plot, Versus fits, Histogram, and Versus order of Filipino gen Zs' Perceived Behavioral Intention

Figure 4 depicts the residual plots that help analyze the normality, homoscedasticity, independence, and model fit of Generation Z's Perceived Behavioral Intention to assess the regression model's validity and assumptions. The normality probability plot was used to test for normality, which shows that the residuals follow a normal distribution as the points lie along the red line. However, the tails show minor deviations, indicating mild skewness. In testing, the homoscedasticity versus fits model is used where it can be seen that the points are randomly scattered with no systematic pattern, indicating constant variance with the residuals. The histogram depicts the distribution of the residuals as symmetric and bell-shaped, the normality of the assumption, and the fact that there is no bias in the prediction. Lastly, the model fit is assessed through the versus order that identifies the autocorrelation. In this graph, the points are randomly scattered with no identifiable trends. It also shows that the residuals are independent over time through arbitrary upward and downward movements.

5.3 Proposed Improvements

The Philippines is a developing country still in the initial phase of adapting to different artificial intelligence tools in different industries (Chitturu et al., 2017). That being said, the usage of it poses freedom for everyone who uses it with no limitations in place regarding its proper usage. No laws or regulations center on using artificial intelligence, leaving a gap in ethical considerations, liability, privacy risks, etc.

Through the results of this study, academic institutions can guide students through the development of school policies or guidelines on the effective utilization of text-generative artificial intelligence in education. These policies can center around plagiarism, prohibition of uploading official school materials for summarization purposes, utilizing them cautiously, and verifying all information gathered. In addition, this can also help schools create new curriculums that can help students utilize artificial intelligence in their respective fields of study. This new curriculum may explore ethics courses on proper usage of artificial intelligence, incorporation of grammatical and plagiarism checkers as part of education tools, and how artificial intelligence is used in the workplace.

The application of this study could also benefit educators to understand further how students utilize artificial intelligence and why they utilize them, using this to their advantage in guiding their students how they can properly utilize the power of artificial intelligence in their everyday tasks. This will allow students to not only use artificial intelligence to cheat but to expand more their skills and use them to aid in their studies in the right way. In relation to integrating ethics courses in the curriculum, educators may use this study to leverage the level of understanding the generation has with regards to artificial intelligence and adjust their materials to further cover what the learners need.

6. Conclusion

The study on Generation Z's utilization of text-generative artificial intelligence reveals significant insights into their behavioral intentions. The findings through the regression model were able to reveal that the factors Effort Expectancy (EE), Performance Expectancy (PE), Facilitating Conditions (FC), Hedonic Motivation (HM), Habit (HB), Ethical Considerations (EC), Perceived Risk (PR), Attitude (ATT), Region, and Gender all significantly affect how Generation Z utilizes text-generative artificial intelligence. This highlights Generation Z's uniqueness towards curiosity, exploration, and risk-taking as the key characteristics that shape how they perceive life and embrace technology. Curiosity is a way in which they seek new experiences and explore a different perspective in what they do. Their risk-taking drives them to seek fulfillment and engage in new activities regardless of the consequences as long as the technology satisfies them (Salleh et al. 2017; Lopez and Abadiano 2023).

Their region or area is a significant factor in Generation Z's behavioral intention to utilize text-generative artificial intelligence. This is true for the Philippines as one of the inequalities still prevalent in the nation lies in digital access, where those coming from rural areas have slow to no internet access, which affects how they utilize artificial intelligence as this requires internet access (Alibudbud 2024). Gender also affects the intention to use artificial intelligence as the different perceptions of artificial intelligence affect how each gender utilizes this tool, where males have a more positive view of the applications of artificial intelligence and trust it more than females (Armutat et al. 2024).

Overall, this study identified the key factors that affect Generation Z's utilization of text-generative artificial intelligence in terms of their behavioral intention. This will give a better understanding of the current behavior and preferences of the generation that will help identify the right approach to addressing the growth of artificial intelligence in the Philippines.

For future studies, researchers can expand the nature of the study of analyzing the behavioral intention when utilizing other types of artificial intelligence or artificial intelligence as a whole. It can also expand to other generations as half of the population of generation z would be young professionals already in the next few years. Lastly, since this study is more centered towards the National Capital Region and Luzon, other studies can further delve into the situation in other regions in the Philippines considering vast cultural diversity of the country, educational gaps, and difference in accessibility in different materials and technology are prominent and creates a divide.

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