

Understanding the Perceptions and Intentions of Pre-Service ECE Teachers in using GenAI

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Abstract: Generative Artificial Intelligence (GenAI) offers both benefits and risks as it becomes increasingly integrated into education. However, its particular role in Early Childhood Education (ECE) remains largely unexplored. This study examines the perceptions and intentions of pre-service ECE teachers regarding GenAI use in the ECE context. The researchers constructed an online survey using a mixed-method convergent-parallel research design. The survey consisted of four-point likert scale and open-ended questions based on the variables of Technology Acceptance Model to assess the current state of the participants' perceptions of GenAI's usefulness and ease of use, alongside their behavioral intentions with GenAI. Thirty (30) pre-service ECE teachers from a state university in Metro Manila, Philippines accomplished this survey. After going through descriptive statistics and thematic analysis, the survey's results revealed that pre-service ECE teachers were generally receptive to GenAI, recognizing benefits such as increased work efficiency and personalized learning. Majority of the participants regard GenAI as useful, although some are still skeptical towards GenAI's ability to produce accurate content. GenAI was also seen as generally accessible and user-friendly, though many report a need for additional effort to garner desired results. Overall, the participants show firm intentions of using GenAI for teaching and learning, though some hold reservations due to fears of overreliance, lack of confidence, and inconsistencies in its output. Following this, the researchers suggest the construction of a framework for better GenAI integration in ECE, as well as further investigations into the effects of external variables to the technology acceptance of pre-service ECE teachers.

Key Words: generative artificial intelligence; early childhood education; pre-service teachers; technology acceptance model

1. INTRODUCTION

One of the most significant advancements in recent years is generative artificial intelligence (GenAI), which has demonstrated the capability to reshape the educational landscape. Its ability to generate content has allowed it to improve learning outcomes, personalize learning, increase student engagement, and automate administrative tasks (UNESCO, 2023; Ayanwale et al., 2023; Addo & Sentance, 2023).

Despite this, GenAI is still relatively new. A lack of familiarity and expertise with GenAI tools exacerbates issues like discouragement, teacher passivity, misinformation, and threats to academic integrity (Su et al., 2023). Since teachers' belief in their ability to use technology influences its integration in education (Zhi et al., 2023), the successful adoption of GenAI depends not only on technical skills but also on teachers' perceptions of its value in education.

Due to this, the study's methodology and instrumentation utilizes variables from the Technology

Acceptance Model (TAM) of Fred Davis (1987), namely perceived usefulness (PU), perceived ease of use (PEU), and behavioral intention (BI). The theoretical framework of the study, the Social Cognitive Learning Theory (Bandura, 1977; Devi et. al. 2017), supports the variables from TAM through the concept of Triadic Reciprocal Determinism, stating that different determinants interact to influence a person's behavior, or in this case, their acceptance of GenAI in the ECE context. Personal determinants, identified as perceived usefulness and perceived ease of use, refer to a person's instincts, beliefs, perceptions, and other motivational forces in a specific context. Behavioral determinants, identified as the behavioral intention, refer to the knowledge and skills acquired and displayed. Environmental determinants, identified as the teaching and learning context GenAI is used in, refer to the social or physical environment that a person is exposed to.

Pre-service teachers in early childhood education (ECE) play a key role in guiding young learners through a critical developmental stage (Hwang et al., 2015), with their knowledge and use of current technologies being essential to shaping children's educational experiences. However, Despite the increasing interest in research for GenAI in education, existing literature shows a lack of studies in the ECE context (Shazaad and Harrison, 2025). There is also a lack of studies addressing professional standards for GenAI use, resulting in unclear and disorganized teacher training for GenAI usage (Raza, 2024), further aggravating risks related to lesson planning, instruction, and administrative duties (Senechal et al., 2023).

To provide a foundation for further GenAI research, this study answered the research question "What are the Pre-service ECE teachers' perceptions and intentions in using GenAI in the ECE context?" To achieve this, this study examined the perceptions and intentions of pre-service ECE teachers through the TAM variables PU, PEU, and BI regarding GenAI use in ECE.

2. METHODOLOGY

2.1 Research Design and Participants

This study used convergent parallel mixed-method design wherein qualitative and quantitative research methods were simultaneously utilized during the data collection process to provide a comprehensive understanding of the problem being studied. The data collected from two methods were analyzed independently, then the results were interpreted together by comparing or relating them. (Creswell and Clark, 2011; Guest and Fleming, 2014).

Moreover, homogenous purposive sampling, a non-probability sampling method, was used to select participants. This enabled the researchers to select participants with common traits (Etikan et al., 2016) who can supplement the research with the most valuable data (Ahmed, 2024) so as to answer the research questions.

The participants of the study were (1) 4th-year undergraduate students from a state university in Metro Manila and (2) specialized in early childhood education. The population of the target participants is 85, and only 30 of them responded and voluntarily participated in this study. It is worth mentioning that the conduct of this research coincided with other academic and practical responsibilities of the target participants, which affected the target participant's availability to take part in the study. Moreover, the researchers also collected data on the frequency of GenAI usage, the purposes for GenAI usage, and knowledge of GenAI among the participants.

2.2 Research Instrumentation

This study used a survey questionnaire that was adapted from existing formats of TAM (Davis, 1987; Lewis, 2019) and was modified to fit the objective of the study. The open-ended questions were constructed with regards to TAM variables, such as PU, PEU, and BI. To establish the validity of the research instrument, it was validated by two early childhood professionals with the assistance of the research adviser. After going through revisions, the instrument was disseminated and administered for three weeks through Google forms. The survey questionnaire was divided into seven sections: (1) demographics of participants, use, purpose, and knowledge of GenAI; (2) a 4-point Likert scale for PU of GenAI; (3) three open-ended questions about the participants' PU of GenAI; (4) a 4-point Likert scale regarding PEU of GenAI; (5) three open-ended questions about PEU of GenAI; (6) a 4-point Likert scale for BI with GenAI; (7) three open-ended questions about the BI with GenAI of the participants.

2.3 Data Analysis

Descriptive statistics were employed for data analysis such as finding the frequency, mean, and standard deviation of quantitative data from the scaled questionnaire in order to present a clear and informative summary of numerical and categorical data (Green et. al., 2023). Specifically, the analysis utilized Jeffrey's Amazing Statistic Program (JASP) software to find the mean and the standard deviation between the data collected, and verifying the reliability of the

measurements and results as the basis for the conclusion of the study.

Correspondingly, the thematic analysis of Braun and Clarke (2013) were used to analyze qualitative data by identifying recurring codes and themes that emerged from the answers of the participants. Specifically, the analysis followed a six-step procedure: 1) familiarization of data; 2) generation of codes; 3) combining codes into themes; 4) reviewing themes; 5) determining significance of themes; and 6) reporting of findings (Dawadi, 2020; DeMarco, 2023).

3. RESULTS AND DISCUSSION

3.1 Use, purpose, and knowledge of GenAI

The findings of the study revealed that the pre-service ECE teachers are frequent users of GenAI, as shown in Table 1. In terms of its purpose, Table 2 indicates that the participants use GenAI to improve their academic writing and generate materials and activities for classroom use. The participants also expressed high self-rating of their knowledge of GenAI in Table 3, insinuating their familiarity with its functions and capabilities.

Table 1. Frequency of GenAI usage

Indicator	Description	Frequency
Frequent usage	Daily or weekly use	26
No usage	Not using	3
Infrequent usage	Rarely or monthly use	1
Total		30

Table 2. Purpose of GenAI usage

Indicator	Description	Frequency
Writing Assistance	Improve academic writing	13
Activity and Content Generation	Generation of class activities, content, and visual materials	12
Teaching and Learning Support	Acquire, clarify, and expand on an information	3
No purpose given	Lack of GenAI experience	2
Total		30

Table 3. Self-rating of GenAI knowledge

Indicator	Mean	S.D.
GenAI knowledge	3.13	0.776

3.2 Perceived Usefulness (PU) of GenAI

The pre-service ECE teachers' PU of GenAI is directed towards it being useful for them in various ways, as shown in Table 4. They perceived their performance to be more efficient with the use of GenAI. Relating to the stated use of GenAI to K-12 teachers, the pre-service ECE teachers specified how their usage of GenAI focused on designing, preparing, and improving classroom interactions which encompasses coming up with ideas for lessons and activities for students tailored to their specific needs (Cheah et. al., 2025; Senechal et. al, 2023).

Table 4. PU of GenAI

Indicator	Mean	S.D.	Verbatim Sample
GenAI aids in quick accomplishment of tasks.	3.40	0.855	P25 It improves my efficiency and I can get things done faster.
GenAI aids in improving performance.	3.27	0.828	P24 Somehow, my teaching performance improved.
GenAI aids in accomplishing more tasks.	3.33	0.758	P27 It allows me to do much more work.
GenAI aids in obtaining desired results.	3.03	0.756	P25 It helps me come up with [content] tailored for my students' grade level.
GenAI makes tasks easier.	3.23	0.858	P22 [Working] becomes easier.
GenAI is beneficial.	3.40	0.814	P6 It is more efficient, interactive, and creative with GenAI.
GenAI is reliable in doing tasks.	2.57	0.858	P8 I can generate ideas which are helpful when needed.

Evidently, pre-service ECE teachers perceived that GenAI is best used for creating personalized learning materials that encourage student engagement. For some, it is useful in acquiring useful information and for improving technicalities of writing, such as when correcting grammar. However, the participants had

notable reservations in using GenAI due to its inability to consistently provide accurate information and tendency to generate inaccurate content. As mentioned by P28, *“Sometimes, the results GenAI provides are inaccurate.”* The results of this section proved that while pre-service ECE teachers acknowledged the capability of GenAI to be a companion in creating materials and enhancing teaching practices for better classroom experiences (Chan and Tsi, 2024) by assisting in the creation of different contents such as audio, texts, images, and videos (Kılınc & Keçecioglu, 2024), their potential risks need to be understood and addressed (UNESCO, 2023) to be better utilized in teaching and learning. Although GenAI can accommodate teachers in efficiency, it evidently requires interventions and adjustments to fit the instruction and content of specific classroom contexts. Findings show that pre-service ECE teachers account for the accurate and secure utilization of a tool, such as GenAI, to be absolute despite its usefulness in teaching and learning processes.

3.3 Perceived Ease of Use (PEU) of GenAI

Table 5. PEU of GenAI

Indicator	Mean	S.D.	Verbatim Sample
GenAI is simple to operate.	2.93	0.828	P15 Simple to use but you need to be specific when asking for help.
GenAI can do what needs to be done.	2.67	0.758	P30 It is easy[,] I need to be detailed and concise.
GenAI interactions are clear and understandable.	2.93	0.740	P19 Getting the best responses can be tricky. It requires a bit of trial and error.
GenAI functions are easy to use and understand.	3.00	0.743	P23 It is helpful when you want to achieve data in [the] easiest [manner] and [with] less effort.
GenAI knowledge can gradually improve over time	3.03	0.850	P17 It takes practice. I have to try different ways of asking to get the best response.
GenAI is accessible.	3.03	0.756	P21 Using GenAI is easy because it is user-friendly, [and] accessible.

Table 5 shows the PEU of the pre-service ECE teachers towards GenAI. It is revealed that they found its complexity, experience, and accessibility fairly easy to use. This is reflected in the relatively small standard deviation showing the fairly consistent opinions of the participants towards using GenAI with moderate ease. They perceived GenAI to be user-friendly, but reported that more effort was required for appropriate use in teaching and learning. They expressed the need to know how to ask the right questions to get the best possible answers from GenAI. Skepticism on the generated data of GenAI was also a common theme among the participants. This—similar to the findings of Kohnke and Moorhouse (2025)—asserts the need for support in upskilling educators with the appropriate use of GenAI. In terms of accessibility of GenAI as a tool for teaching and learning, pre-service ECE teachers perceived it to be widely available online, although there are mentions of instances where using GenAI requires specific resources for access, such as the need for a subscription and internet connectivity. P29 specified, *“There are [GenAI] websites or applications that are free but [have] limited use. The ones that generate better outputs ask for subscriptions.”* This provides context as to how the more rational and coherent use of GenAI is bounded by economical differences among its users. According to Zhao et. al. (2024), satisfaction in a tool is commonly expressed by users when their specific needs are met. Following this, the results showed positive perception of GenAI among the participants following its deemed efficiency for teaching and learning. This positive PEU of GenAI among pre-service ECE teachers also reflects their attitude and intention as end-users of technology (Lu et al., 2024).

3.4 Behavioral Intention (BI) with GenAI

Table 6. BI with GenAI

Indicator	Mean	S.D.	Verbatim Sample
Interest in using GenAI.	3.47	0.629	P5 It allows the teacher to ease the burdens of teaching preparations.
Intention to know more about the use of GenAI.	3.47	0.629	P18 I am interested to know how far it can accommodate my questions or requests.

Confidence in using GenAI.	3.00	0.695	P19 I feel less confident because it gives inaccurate information[.]
Intended duration of using GenAI.	2.80	0.664	P16 I believe I can use GenAI for as long as technology continues to grow and advance.

The indicators of the BI of the pre-service ECE teachers suggested positive intentions towards GenAI, as shown in table 6. Results showed that participants are interested in using GenAI to ease and support in preparation and implementation in teaching and learning. Notably, the mean of indicators regarding confidence and frequency of use was noticeably lower despite relatively similar opinions across the group, evidenced by the recorded standard deviations. The relative lack of confidence and actual usage of GenAI from the participants can be attributed to the risks posed by accuracy issues and ethical concerns. P30 stated, “[The] ethical considerations make me less confident. GenAI is really helpful but we need to be careful to avoid plagiarism and copyright infringement.” The concept of risk aversion states that people prefer outcomes with low uncertainty over those with high uncertainty. In the context of the study, the perceived risks of GenAI may delay the adoption of new technologies despite their potential benefits (Sendstad and Chronopoulos, 2021). The perception of these concerns as threats to academic integrity and accuracy may also appeal to a fear response as discussed in the Protective Motivation Theory (Rogers, 1975), manifesting as an observable gap in a receptiveness towards the concept and actual usage (Alhelaly et al., 2023).

Implications of stagnation or degradation may also be inferred from statements of the pre-service ECE teachers such as that from P30 “As long as it is helpful and not harmful for me.” When asked about which aspects of GenAI makes them more or less confident in using it, P11 answered, “On how quickly it will replace actual teachers,” indicating concerns over a potential paradigm shift in the field of education due to common GenAI usage in recent years. The reluctance of the pre-service ECE teachers in using GenAI could reflect a desire to maintain the existing professional standards and situation of teachers, as shown in a study on the effects of a bias for the status quo in organizational change (McLaren et al., 2025). The concept of digital

natives and digital immigrants may also factor into this, as those who grew up with GenAI technology would likely accept its existence due to their familiarity with it (Milutinović, 2022). Conversely, those who witnessed its creation are less likely to accept it due to a desire to maintain pre-AI practices.

4. CONCLUSIONS

Pre-service ECE teachers are generally receptive towards the use of GenAI in ECE. The primary factors for this include their perceived increased efficiency due to GenAI’s quick response time and easier personalization of learning due to the ability to influence GenAI’s output to generate content or ideas fit for specific classroom needs. They regard GenAI to be useful in supporting and enhancing their performance, although skepticisms are manifested due to the likelihood of GenAI-generated content to be inaccurate and unreliable. Most of them identify GenAI to be user-friendly and accessible but may still require additional effort to garner desired results. Finally, the pre-service ECE teachers show firm intentions of using GenAI for teaching and learning, but with reservations due implied effects of overreliance, lack of confidence, and inconsistencies in its usage.

Given the findings of the study, the researchers suggest that developing a context-specific framework for the integration of GenAI in ECE would greatly alleviate GenAI’s drawbacks. This would allow for the identification of appropriate GenAI tools and platforms suitable for ECE, establish clear guidelines and best practices for GenAI’s usage in the ECE context, offer scaffolding techniques to avoid overreliance, encourage critical thinking for both teachers and learners, and provide opportunities for professional development.

Additionally, the researchers also suggest designing more structured training programs to address the skepticism and reservations expressed by the participants of the study. Essential inclusions would likely include building confidence with GenAI usage, critical evaluation of GenAI output, managing risks and inconsistencies of GenAI material, and promoting collaborative activities where GenAI supports human creativity and pedagogical decision-making rather than replacing it entirely.

Moreover, the researchers also suggest that other studies conduct a more thorough investigation on the effects of external variables, as they may provide further insights on the integration of GenAI in ECE.

Further research ventures into this topic may also find value in broader and more varied data-collection methods. Since homogenous purposive sampling was used and the sample size was limited, the representativeness and generalizability of data was decreased.

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