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Socio-Cognitive Factors Affecting the Behavioral Intention of Preservice Teachers to Use Educational Technology

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Abstract. In today's fast-changing educational settings, technology integration offers the opportunity to enhance mathematics instruction. This study determines the significant socio-cognitive factors among preservice mathematics teachers (PMTs) affecting their behavioral intention toward the use of technology. A descriptive-correlational research design was employed with 130 participants. Revised UTAUT construct items and behavioral intention scales were utilized through survey forms. Findings revealed that the participants were more inclined to use technology in their pedagogical approach. The only socio-cognitive factors significantly affecting the participants' positive inclination to utilize educational technology were performance expectancy, effort expectancy, and social influence. However, when controlling for the effects of the participants' willingness to use technology, social influence became insignificant. Developing favorable impressions of technology's effectiveness and ease of use may encourage greater technology integration in mathematics education.

Keywords: cognitive benefits; mathematics education; prospective teacher; technology integration

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1. Introduction

Researchers have long understood the importance of behavioral intention in empowering teachers to better utilize those learning resources which will substantially affect their pedagogical approaches. Behavioral intention *(BI)* refers to the degree to which an individual has formed an intentional plan to perform a specific action (Humida et al., 2021). This intention reflects a positive inclination to undertake certain activities, based on the current active goal of the individual (Ajzen & Kruglanski, 2019). Thus, the predictive power of *BI* can indicate teachers' classroom preferences toward adopting various educational technologies (Sun & Zhou, 2023). The preference for choices as a reinforcer has been the predictive nature of *BI* in decision-making processes, which can be applied to educational settings (Kestner et al., 2023). Since educators should employ innovative teaching methods (Pentang et al., 2023), several factors could be considered when determining the willingness and strength of teachers' *BI* towards adopting technology.

Particularly when incorporating technology, an individual's *BI* can be significantly determined by socio-cognitive factors (Dalinger & Asino, 2021). A broad set of constructs including behavioural patterns, environmental influences, and personal factors influence a person's intention to use technology (Govindaraju, 2021). Accordingly, performance expectancy (*PE*) describes individuals' perceptions of the disadvantages and benefits of a piece of technology (Wulandari et al., 2020). This relates to the way in which individuals intend to utilize digital tools to enhance their job performance (Ramos & Queiroz, 2022). Similarly, effort expectancy (*EE*) emphasizes the individual's perception of the degree of effort required to properly integrate and use technology in day-to-day routines (Wahyuni et al., 2021). This component underscores how the ease of using technology can determine an individual's intention to adopt various technologies.

On the other hand, social influence (*SI*) refers to the influence of different people's views and ideas on an individual's intention to utilize a specific technology or system (Nur & Panggabean, 2021). Social influence incorporates peer endorsement, social norms, image, and other social factors that may influence an individual's *BI* regarding the use of technology (Elshafey et al., 2020). Facilitating conditions (*FC*) describe an individual's perception of the extent to which the existing administrative and technological infrastructure can encourage and support the use of a particular technology (Shambare et al., 2022). This component examines how individuals' intentions are shaped by access to digital tools, organizational support and the training necessary to use various digital tools. This socio-cognitive factor might be considered essential for successfully integrating digital tools, and is therefore particularly relevant for mathematics educators, who seek to strengthen the learning outcomes of students while improving their own teaching approaches.

Furthermore, the Unified Theory of Acceptance and Use of Technology (UTAUT) could explain the connection between *BI* and factors shaping users' *BI* regarding technology adoption (Ghazali et al., 2022). Several studies have demonstrated how

this comprehensive framework models the four pivotal socio-cognitive constructs (*PE, EE, SI, & FC*) in shaping the *BI* of an individual toward the use of technology and the actual usage behavior (Li & Zhao, 2021). Researchers into technology adoption formulated this framework based on various theories regarding the sustained development of technologies in various organizations (Venkatesh et al., 2003). The UTAUT combines elements from the Technology Acceptance Model, the Theory of Reasoned Action, the Theory of Planned Behavior, the Diffusion of Innovation Theory, the Socio-Cognitive Theory, the Motivation Model, and the Model of Personal Computer Utilization (Alkhwaldi & Abdulmuhsin, 2021). Collectively, the framework addresses the limitations of the previous models regarding users' acceptance of technology by incorporating individual and contextual factors, thereby offering a more comprehensive understanding of technology adoption behavior (Nnaji et al., 2023). Moreover, the UTAUT framework was adapted to suit specific research contexts, incorporating additional factors and moderators to understand users' behavior toward technology adoption.

In addition, an individual's willingness thus supports the development of innovative concepts and encouragement in a dynamic setting (Saad et al., 2023). Willingness to adopt new technology offers an invaluable approach to increasing teachers' digital competency, which, in turn, helps to improve their instructional strategies and enhances student learning outcomes (Astuti & Setiawan, 2023). The voluntary adoption of digital tools is essential for educational innovation. However, the need for improvement in this regard persists (Granić, 2022). Resistance to change, relating to the incorporation of new technologies in educational settings, has been linked to educators' comfort and familiarity with traditional teaching methods as well as the extent of their voluntary adoption of technology (Huang & Teo, 2020). Hence, addressing teachers' willingness to utilize technology effectively and promote positive outcomes in educational settings can lead to opportunities to enhance teaching pedagogy, increase student engagement, achieve learning outcomes, use resources more efficiently, and align technology initiatives with academic goals. In order to fully understand the relationship between the socio-cognitive factors of PMTs and their *BI* in utilizing technology, eliminating the negative impacts of willingness to use technology is imperative.

Specifically, this study aims to answer the following questions:

i. What is the level of agreement on the socio-cognitive factors affecting PMTs' use of educational technology in terms of performance expectancy, effort expectancy, social influence, and facilitating conditions?
ii. What are the levels of behavioral intention to use educational technology among PMTs?
iii. Do socio-cognitive factors significantly predict the behavioral intentions of PMTs to use educational technology?
iv. Do socio-cognitive factors significantly predict the behavioral intentions of PMTs when controlling for the effects of their willingness to use educational technology?

This study provides an in-depth analysis and comprehensive discussion of the significant socio-cognitive factors potentially affecting PMTs' behavioral intentions to fully incorporate various educational technologies into their teaching practices. This analysis is based on the UTAUT model, which provides a solid theoretical foundation for exploring these factors. Additionally, this study provides instructive insights for educational institutions and policymakers in Central Luzon to understand the concerns associated with PMTs' adoption of various educational technologies.

2. Literature Review

2.1 Teachers' Behavioral Intention to Use Educational Technology

In recent decades, various theoretical perspectives have been established to explain educators' *BI* regarding technology acceptance. Several studies have pointed out that *BI* has been the direct predictor of usage behavior towards a particular technology (Kalogiannakis & Papadakis, 2019). Adopting technology in the classroom requires the consideration of such factors as organizational support, social influences, and teachers' motivation (Liu et al., 2020). In terms of technology adoption, teachers' perceptions can significantly enhance their teaching methods and competency, offering the potential to keep students engaged in the teaching-learning process (Adhikari, 2021). Related studies have indicated a strong correlation between teachers' attitudes, perceived usefulness, self-efficacy, and social influences regarding technology integration and their *BI* (Wen & Tan, 2020). Consequently, the increasing usage of technology in the classroom confirms the importance of identifying other factors affecting the willingness of educators to adopt technologies (Haleem et al., 2022). The significant predictor of teachers' *BI* to use ICT in teaching highlights several social and cognitive factors, such as performance expectancy, effort expectancy, social influence, facilitating conditions, self-efficacy, and anxiety (Mutisya, 2020).

2.2 Socio-Cognitive Factors Regarding Technology Adoption

The emphasis on the socio-cognitive factors associated with adopting technology highlights the important role of both social and cognitive aspects when predicting individual intentions and willingness to adopt technologies (Perkmen et al., 2023). For example, several studies have revealed that *PE* and *EE* are vital factors, demonstrating that individuals are more likely to adopt technologies in educational environments when they perceive that the technology will enhance their performance and that it will be easy to use (Gupta et al., 2022). Accordingly, *PE* was found to be one of the critical factors that significantly shape teachers' intentions to adopt modern technologies (Wang et al., 2022). Furthermore, a significant positive correlation was found between teachers' performance expectations and their *BI* regarding the adoption of digital technologies, indicating that when teachers' performance expectation increases, they are more eager to incorporate digital technology in their teaching practices, enhancing their effectiveness in teaching (Unasiansari et al., 2024). Additionally, when users perceive technology as being easy to use and the cognitive effort involved in acquiring the skills needed to successfully utilize modern

technologies seems achievable, this *EE* considerably impacts users' willingness to adopt the technology (Mardhiah et al., 2022). Prior studies have reported that effort expectations are closely related to perceived ease of use, ease of learning, and efficacy beliefs, all of which have a positive impact on individuals' *BI* (Dosaya et al., 2020). Hence, the performance and effort expectations are crucial cognitive components for predicting the *BI* of PMTs' willingness to use educational technology.

Furthermore, social factors might also play a substantial part in the adoption of various technologies. For instance, social influence is defined as the degree to which an individual's behavior is influenced by others (Brugger & Henry, 2019). The theory of social influence highlights that various social elements can affect an individual's preference when implementing modern technological features (Rui, 2020). The inclusion of social influence among the relevant socio-cognitive aspects implies that influence from peers and societal norms substantially impacts an individual's decision to adopt a technology (Touil & Jabraoui, 2022). Additionally, technological infrastructure and institutional and organizational support for using a specific technology can allow individuals to embrace and incorporate technology into their workflow (Xue et al., 2021). Moreover, the impact of technological facilities on students' learning experiences has been studied, emphasizing the significance of having adequate resources to support digital education (Timotheou et al., 2022). Hence, a lack of support from school managers and insufficient available devices are significant barriers to the successful implementation of various technologies (Dele-Ajayi et al., 2021).

2.3 Teachers' Willingness Regarding Technology Adoption

Voluntary technology adoption could determine an individual's intention and willingness to integrate various modern technologies (Park et al., 2022). In a classroom setting, it was found that teachers who are more willing to adopt technology in their teaching practices are also more likely to explore distinct innovative methods and materials by incorporating technology into their classroom environments than those who delay the adoption of technology (Puspandari, 2023). In addition, it was revealed that the willingness of higher education tutors to adopt and utilize Learning Management Systems (LMS) for blended and distance learning was mainly influenced by performance expectations (Musa et al., 2022). The perceived usefulness and ease of use regarding technology significantly contribute to favorable intention, implying that when individuals perceive technology as being beneficial and easy to use, they are more likely to voluntarily adopt a specific technology (Gao & Liu, 2023). In cases of voluntary adoption, individuals' expectations regarding a technology's benefits and ease of use become more influential in their decision to use it (Mardhiah et al., 2022). When considering voluntary adoption, individuals carefully assess these factors, centering their decision around their evaluation of the technology's advantages and usability (Zhang & Khachatryan, 2023). Hence, developing an organizational culture that encourages voluntary adoption and presenting new technology in such a way as to promote the

relative advantages and minimal effort required could contribute to a more favorable environment for technology adoption.

3. Methodology

3.1. Research Design

This study utilized a descriptive-correlational research design. The descriptive design can give comprehensive insights into the socio-cognitive factors affecting participants' *BI* to use educational technology for mathematics instruction. Meanwhile, a correlational research design was utilized to determine the relationship between the participants' socio-cognitive factors and their *BI* to use technology.

3.2. Sample and Data Collection

This study was directed toward PMTs, who will be responsible for delivering mathematical lessons. 130 respondents were selected, using simple random sampling, from universities in Central Luzon, Philippines, during the academic year 2022-2023. Central Luzon represents a diverse educational landscape in the Philippines. Such diversity offers a rich background against which to examine the socio-cognitive factors affecting PMTs' *BI* to access and integrate educational technology. All of the participants had experienced using educational technology, with 33 participants having experienced it for fewer than three years and 97 participants having experienced it for more than three years. In terms of willingness to use educational technology, 113 (86.9%) of the participants reported that they were willing to use educational technology, while 17 (13.1%) participants responded negatively.

3.3. Research Instrument

The first part of the instrument determined the PMTs' willingness to utilize educational technology. The second part used a modified 19-item Likert scale research instrument, from Venkatesh et al. (2003), titled UTAUT construct items and *BI* scale, which corresponds to each participant's level of agreement with socio-cognitive factors that could affect their *BI* to use educational technology, denoted as 1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly Agree (see appendix). The instrument comprised of five components: performance expectancy, effort expectancy, social influence, facilitating conditions, and participants' *BI* to utilize technology.

Additionally, a panel of three experts in mathematics education and educational technology reviewed the items. The suggestions made by the panel were incorporated into the questionnaire to ensure that the instrument adequately and relevantly covered the parameters of socio-cognitive factors affecting technology adoption in a classroom setting. Before the primary data collection, the validated instrument was subjected to pilot testing with 60 non-participants across other universities; this yielded a Cronbach's alpha of 0.91 for the overall scale, implying that the items have high internal consistency and are therefore highly reliable.

3.4. Ethics Statement

This study prioritized the participants' rights and well-being during the entire period of data collection. Participation was transparent and voluntary, and the participants' anonymity was rigorously upheld, thereby elevating the trustworthiness and dependability of the research findings. The Ethics Review Committee of the Central Luzon State University approved the research protocol: Science City of Muñoz, Nueva Ecija, Philippines [ERC Code: 2023-504].

3.5. Analysis of Data

The willingness of the participants to use educational technology was described using mean and standard deviation. The computed means for socio-cognitive factors were transmuted to qualitative description: strongly disagree (1.00-1.79) as negative perception, disagree (1.80-2.59) as poor perception, neutral (2.60-3.39) as uncertain perception, agree (3.40-4.19) as moderately positive perception, and strongly agree (4.20-5.00) as positive perception. Multiple regression analysis was used to determine the significant socio-cognitive factors affecting the participants' *BI* to utilize educational technology. Hierarchical regression analysis was used to determine the relationship between the socio-cognitive factors affecting the participants' *BI* while controlling for the effects of willingness to use technology (coded as 0-No, 1-Yes).

4. Results and Discussion

4.1. The Socio-Cognitive Factors Affecting Participants' Use of Technology for Mathematics Instruction

The PMTs exhibited a moderately positive perception of the socio-cognitive factors (M = 3.59, SD = .49) affecting technology usage for mathematics instruction (Table 1). Among these socio-cognitive factors, the participants displayed a moderately positive perception of performance expectancy (M = 3.81, SD = .58), effort expectancy (M = 3.62, SD = .62), and social influence (M = 3.61, SD = .61), indicating that these factors satisfy the contention that they affect the participants' intention to utilize technology. However, the participants showed an uncertain perception of facilitating conditions (M = 3.31, SD = .61), suggesting that this factor did not affect their intention to utilize technology.

Table 1: Socio-Cognitive Factors Affecting the Participants' Use of Technology

Socio-Cognitive Factors	*M*	*SD*	Interpretation
Performance Expectancy	3.81	0.58	Agree
Effort Expectancy	3.62	0.62	Agree
Social Influence	3.61	0.61	Agree
Facilitating Conditions	3.31	0.61	Neutral
Overall Socio-Cognitive Factors	**3.59**	**0.49**	**Agree**

Note: 1.00-1.79 = Strongly Disagree, 1.80-2.59 = Disagree, 2.60-3.39 = Neutral, 3.40-4.19= Agree, 4.20-5.00 = Strongly Agree

A moderately positive perception among PMTs towards socio-cognitive factors could significantly influence their intention to use educational technology for mathematics instruction (Njiku et al., 2023). This indicates that socio-cognitive factors could lead PMTs to utilize various digital tools for enhancing their teaching effectiveness, making learning experiences more engaging and incorporating user-friendly digital tools into their teaching practices (Purwaningtyas et al., 2023). Similar findings have indicated that educators who maintain a positive attitude towards technology are more inclined to adopt teaching methods that enhance the teaching-learning process and to effectively utilize technology (Ibrahim & Shiring, 2022). Moreover, the findings suggest that peer influence, social norms and other social factors could affect the intention of PMTs to incorporate technology (Tran et al., 2023).

Additionally, the participants demonstrated an uncertain perception regarding the sufficiency of technological facilitation and support within their institutions. This indicates that PMTs need to perceive the existing institutional support, access to digital devices, and technological infrastructures in order to utilize educational technology (Persada et al., 2022). Previous findings have similarly indicated that insufficient funding for technological infrastructure and limited access to digital learning tools signify a need for clearer and more cohesive technology implementation in classroom settings (Selialia & Kurata, 2023). Indeed, teachers' resistance to technology adoption in classrooms has mainly been attributed to a lack of support from school management and insufficient numbers of available devices (Lyanda, 2023). Consequently, educational policymakers should strengthen the existing policies and support regarding the utilization of relevant digital tools, making them accessible and equitable for teachers and students to ensure the successful implementation of modern technologies (Foltyn & Polok, 2022).

4.2. The Socio-Cognitive Factors Affecting Participants' Use of Technology for Mathematics Instruction

The levels of *BI* among the participants were categorized into three levels: low intention (1.5%), average intention (32.30%), and high intention (66.20%). This indicates that 86 participants had a high intention to utilize technology for mathematics instruction. Moreover, 42 participants had an average intention of adopting technology in mathematics classrooms, and only two had a low intention to use technology.

The results show that the participants with high intentions illustrated a strong desire to utilize technology, indicating that they were more eager to adopt technological methods to enhance their pedagogical approach. Additionally, participants with an average level of intention to embrace technology had a moderate level of willingness to utilize technology (Bütün & Karakuş, 2021). Although not as pronounced as the high-intention group, a significant portion of participants had a moderate intention to utilize technology to enhance their pedagogy. Conversely, those with low intention to use technology showed reluctance or resistance to integrating technology into their teaching methodologies (Asbulah et al., 2022). This low level of intention underscores

the importance of addressing concerns and supporting teachers' transition towards embracing technology.

Table 2: Participants' Level of Behavioral Intention in Utilizing Technology

Outcome Variable		Frequency	Percentage
Level of Behavioral Intention in Utilizing Technology for Mathematics Instruction	High Intention	86	66.20
	Average Intention	42	32.30
	Low Intention	2	1.50
	Total	**130**	**100.0**

Note: Low Intention (1.00 to 2.33), Average Intention (2.34 to 3.67), High Intention (3.68 to 5.00)

The results reveal that the majority of teachers have a high intention to embrace educational technologies; this aligns with the notion that most educators are motivated to incorporate technology into their forthcoming lessons. Most educators portray a positive inclination toward technology, frequently using digital resources such as smartboards (Yao & Zhao, 2022). Despite the availability of various technological tools, it was revealed that some educators continue to exhibit reluctance toward employing digital technology in their teaching, based on their attitudes (Zainudin & Bakar, 2023). This finding emphasizes that training, mentorship, and curriculum refinement are necessary to support mathematics educators to gain confidence in utilizing technology to achieve effective learning outcomes for their students. Because those teachers with low intention to use technology have negative attitudes and reluctance regarding the utilization of technology (Xu et al., 2020), it would be beneficial for educational institutions in Central Luzon to implement educational technology training courses, in order to support PMTs in utilizing technology.

4.3. Socio-cognitive Factors Predicting the Participants' Behavioural Intention in Utilizing Technology for Mathematics Instruction

The multiple regression analysis revealed that three predictors among the socio-cognitive factors significantly affected PMTs' *BI* in utilizing technology (Table 3). According to the results, *PE* (β = .356), *EE* (β = .326,) and *SI* (β = .284) were statistically significant ($p < .05$) and explain 42.8% of the variance observed in the *BI* among PMTs in utilizing technology. This implies that a unit increase on each predictor corresponds to an increase in the indicated beta score. Thus, the equation of regression analysis is $y = 2.447 + 0.356x_1 + 0.326x_2 + 0.284x_3$, where y = behavioral intention in utilizing technology; x_1 = performance expectancy; x_2 = effort expectancy; and x_3 = social influence, enabling the estimation of the behavioral intention regarding technology use.

Table 3: Multiple Regression Analysis of the Significant Socio-cognitive Factors Predicting Behavioral Intention

Model	β	t	p	R	R^2
Constant	2.447	0.035	0.972	0.654	0.428
Performance Expectancy	0.356	2.345	0.021		
Effort Expectancy	0.326	2.264	0.025		
Social Influence	0.284	2.064	0.041		
Facilitating Conditions	0.116	1.079	0.283		

Note: Dependent Variable (Behavioral Intention)

Socio-cognitive factors play a crucial role in shaping PMTs' intention to utilize technology. The findings reveal that PE emerges as a significant predictor affecting PMTs' *BI* to use technology. Those participants with a higher degree of *PE* have a higher intention to utilize technology (Omar et al., 2022). In other words, PMTs who perceive that utilizing technology will positively influence their teaching practices and will enable their students to successfully meet the learning outcomes in mathematics are more likely to implement new technology.

Furthermore, the findings reveal that motivation to use technology among educators is correlated with a high level of proficiency (Tan & Jiang, 2021), implying that technology could facilitate more engaging, efficient, and effective teaching practices. In contrast, the reluctance of some educators to utilize technology indicates that they do not necessarily perceive that utilizing the technology will enhance their teaching practices or allow the students to successfully meet the learning outcomes in mathematics (Cullen et al., 2020). Thus, the findings suggest that a better understanding of the advantages of utilizing technology could foster a more positive attitude and intention toward using technology in teaching. The perceived benefits of technology in terms of skills development, teacher training programs, and educational initiatives can effectively promote greater acceptance and wider adoption of educational technology (Abbas et al., 2023), suggesting that these advantages of technology use could be used to inspire the intention of PMTs.

Similarly, *EE* has been identified as a significant predictor of *BI* among PMTs with regard to using educational technologies. The results indicate that the participants with a higher degree of *EE* have a higher intention to utilize technology in mathematics classrooms (Almaiah et al., 2019), suggesting that PMTs who perceive educational technology to be user-friendly have a higher intention to use technology in their teaching practices. The acceptance of technology in mathematical pedagogy is correlated to the significance of effort expectancy in enhancing teachers' acceptance and intention to use technology in mathematics education. However, the perception of effort does not consistently predict the importance of effort expectancy in influencing individuals' intentions in utilizing technology (Kaur et al., 2024). This indicates that the necessity of understanding effort expectancy interacts with other variables and plays a crucial role in determining *BI*, which is essential for

implementing effective strategies to promote technology integration in educational settings.

Additionally, *SI* emerges as a significant predictor that affects the *BI* of PMTs in utilizing technology. *SI* affects the level of intention to use technology (Arthur, 2022), implying that PMTs who recognize the opinions and experiences of influential individuals, such as peers, mentors or educational leaders, are more likely to use technology. This finding relates to the notion that the impact of social influence on teachers' *BI* is an essential consideration in designing effective strategies to promote technology integration in an educational context (Botero et al., 2022). *SI,* including subjective norms and social factors, is crucial in shaping teachers' *BI* toward technology adoption and use (Ursavaş et al., 2019). Consequently, it was determined that social dynamics cannot have a substantial positive impact on intention to use technology without adequate support and resources (Al-Rahmi et al., 2019).

On the other hand, the findings reveal that *FC* does not emerge as a significant predictor of the intention of PMTs to use educational technology. This indicates that institutional support, technological infrastructures, and access to digital tools were less influential in terms of PMTs' intention to utilize educational technology (Oguguo et al., 2023). In addition, this factor could be less influential for PMTs who have a higher intention to use technology as several limitations could hinder their adoption of various educational technologies, such as a lack of technological infrastructures, unavailability of digital tools, and inadequate support systems within the institution (Dawadi, 2022). Similar findings have revealed that poor internet connections and limited electronic materials have created barriers for senior high school educators in fully utilizing digital learning tools (Del Mundo, 2022). However, other studies have asserted that extensive support in using educational technology for teachers is a critical factor that can either enhance or hinder the use of ICT by teachers in the classroom (Mariano-Dolesh et al., 2022). Therefore, educational institutions should ensure that access to technological infrastructure and adequate support are continuously provided in order to develop the competency and confidence of future mathematics educators in adopting various educational technologies.

4.4. Socio-cognitive Factors Predicting Participants' Behavioral Intention when Controlling for the Effects of Willingness to Utilize Technology for Mathematics Instruction

In this study, the primary contingency considered was the voluntary engagement of PMTs toward utilizing technology for mathematics instruction. Following the analysis of socio-cognitive factors (see Table 4), the results revealed that *PE* (β = .352) and *EE* (β = .351) continued to be significant predictors when controlling for PMTs' willingness to utilize technology (p < .05) and explained 44% – nearly half – of the variance in terms of the degree of their *BI* in using educational technology. This indicates that each predictor's one-unit increase corresponds to a *BI* increase relative to the stated beta score. PMTs with willingness (β = .326) to utilize technology are likelier to use technology. Correspondingly, the equation of regression analysis is y =

$0.898 + 0.352x_1 + 0.351x_2 + 0.326x_3$, where y = behavioral intention in utilizing technology; x_1 = performance expectancy; x_2 = effort expectancy; x_3 = willingness to use, to enable the estimation of the behavioral intention in utilizing technology.

Table 4. Hierarchical Regression Analysis of the Participants' Behavioral Intention in Utilizing Technology

Model	β	t	p	R	R^2
Constant	0.898	1.726	0.087	0.663	0.440
Performance Expectancy	0.352	2.020	0.004		
Effort Expectancy	0.351	2.424	0.002		
Social Influence	0.270	2.020	0.076		
Willingness to use Educational Technology	0.326	2.060	0.041		

Note: Dependent Variable (Behavioral Intention)

The results revealed that an open willingness of PMTs enhances their intention to utilize technology for mathematics instruction. The findings indicate that PMTs who are more willing to adopt educational technology are more likely to incorporate technology to improve their teaching practices (Sim & Ismail, 2023). In addition, those participants who were open to the idea of voluntarily using technology in their teaching practices demonstrated a higher intention to use it than those who were less receptive (Bervell et al., 2022). Therefore, the positive inclination of PMTs demonstrates that they are more open to employing innovative teaching methods to enhance their competency in utilizing technology. Similar findings have indicated that the intention of college educators to use technology significantly increases when they perceive that they have the freedom to incorporate digital tools in their teaching practices (Lau, 2023). Consequently, this suggests that educational institutions should encourage the voluntary adoption of digital tools to promote the full utilization of digital tools (Ray & Sikdar, 2023) by providing relevant training and ongoing support for teachers. By so doing, the educational institutions in Central Luzon will more likely produce teachers who are able to teach in both traditional and digital learning environments.

In addition, *PE* and *EE* remained as significant predictors of *BI* among PMTs, even when the participants were open to using technology voluntarily (Salleh et al., 2022). This finding indicates that, regardless of willingness to use, PMTs are more likely to utilize digital learning tools that can enhance their teaching performance, as long as they are also user-friendly (Logroño & Costelo-Abrea, 2023). Related studies have indicated that the factors of perceived benefits and perceived ease of use are fundamental in shaping the intention of teachers to incorporate technology into their pedagogical approaches (Menabò et al., 2021). The practical advantages of technology for PMTs and the ease of using technology are the most influential factors in determining PMTs' intention to use the technology (Indalecio, 2022). Hence, educational institutions should focus on promoting the practical advantages and ease of using educational technologies.

On the other hand, *SI* did not emerge as a significant predictor when controlling for the effects of PMTs' willingness to utilize educational technology (Zhou et al., 2022). Indeed, the results reveal that those PMTs with a higher intention to use educational technology were more driven by their personal preference and voluntary choice, rather than considering the perceptions of their colleagues (Alshehri, 2023). Therefore, social factors serve only as a guide and additional support for PMTs in terms of technology adoption (Rahmadi & Lavicza, 2021). According to the results, *SI* becomes less influential when there is greater willingness to adopt new technology. Possibly, this might suggest that PMTs perceive peer recommendations and social factors as causing confusion and ambiguity in terms of utilizing various educational technologies (Adipat et al., 2023). Moreover, a varied range of perceptions and diverse viewpoints regarding digital learning tools could offer mixed outcomes that might affect PMTs' teaching performance (Yin & Mohamad, 2023). Hence, the voluntary adoption of educational technology plays a more significant role in shaping the *BI* of PMTs, allowing them to freely explore various digital learning tools that are contextually appropriate to the content of their subject matter. Thus, PMTs' voluntary approach to technology adoption could foster a greater likelihood of improving their teaching practices and enhancing students' learning outcomes, rather than considering the perceptions and external influences of others. This suggests that educational institutions should foster professional growth among educators to support the voluntary adoption of various educational technologies to achieve better teaching-learning experiences for teachers and students.

5. Limitations

Although the findings of this study will be of significant interest to researchers in this field, the study was not without its limitations. Specifically, the study was limited to the context of PMTs in Central Luzon, Philippines. Hence, the generalizability of the results may vary among other universities or educational institutions. Only four socio-cognitive factors were found to affect PMTs' *BI*, even when controlling for their willingness to use. Thus, extrinsic factors and other aspects influencing technology adoption may be considered for future research.

6. Conclusion and Recommendations

The participants of this study indicated that they were open to utilizing various digital tools voluntarily, since this would enhance their teaching effectiveness. Additionally, their willingness to utilize technology in mathematics classrooms signals a firm foundation upon which educators can maximize their use of technology, regardless of any negative feedback or the differing perceptions of their colleagues. Consequently, this highlights that the success of technology integration in mathematics instruction depends fundamentally on the intention of PMTs. However, social influence may serve as a guide, providing additional support for PMTs' intentions to adopt various educational technologies. In this study, the PMTs had no perceptions regarding the facilitating conditions for utilizing technology since they had yet to be exposed to actual classroom practice.

Educational institutions should establish a specific policy regarding the implementation of new technologies, such as promoting the benefits and ease of utilizing a particular technology. Such strategies may lead to more PMTs implementing technology in their mathematics instruction. Furthermore, other researchers may wish to continue to explore and analyze the factors that contribute to the success of technology adoption in classroom settings. Future studies could investigate the multifaceted nature of willingness, as well as other intrinsic factors, such as motivation and readiness, in relation to utilizing technology.

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Appendix

Research Questionnaire

Revised Unified Theory of Acceptance and Use of Technology Construct Item and Behavioral Intention Scale

Direction: For this part, encircle the number that corresponds to your level of agreement to each statement.

5 = Strongly agree **4** = Agree **3** = Neutral **2** = Disagree **1**= Strongly disagree

Construct Items and Behavioral Intention Scale	SD	D	N	A	SA
Performance Expectancy					
I would find educational technology useful for mathematics classroom instruction.	1	2	3	4	5
Using educational technology will enable me to accomplish more tasks quickly for mathematics classroom instruction.	1	2	3	4	5
The use of educational technology will allow me to have access to more information about mathematics classroom instruction.	1	2	3	4	5
Using educational technology will help me to achieve the intended learning outcomes of my mathematics classroom instruction.	1	2	3	4	5
Effort Expectancy					
My interaction of using educational technology for mathematics classroom instruction would be clear and understandable.	1	2	3	4	5
Learning to operate educational technology for mathematics classroom instruction is going to be easy for me	1	2	3	4	5
I would find educational technology as easy to use for mathematics classroom instruction.	1	2	3	4	5
It would be easy for me to become skillful when using educational technology for mathematics classroom instruction.	1	2	3	4	5
Social Influence					
People who influence my behavior thinks that I should use educational technology for my mathematics classroom.	1	2	3	4	5
People who are important to me thinks that I should use educational technology for my mathematics classroom.	1	2	3	4	5
The faculty at my institution will be helpful when I use educational technology for mathematics classroom instruction.	1	2	3	4	5
In general, the institution of education will support the use of educational technology for classroom instruction.	1	2	3	4	5
Facilitating Conditions					
I have the resources necessary to use educational technology for mathematics classroom instruction.	1	2	3	4	5
I have the knowledge necessary to use educational technology for mathematics classroom instruction	1	2	3	4	5
A help is available when I get problem for using educational technology in mathematics classroom.	1	2	3	4	5
Educational Technology is going to be compatible with other systems I use for mathematics classroom.	1	2	3	4	5
Behavioral Intention					
I intend to use Educational Technology for mathematics classroom instruction in the future.	1	2	3	4	5
I predict I will use Educational Technology mathematics classroom instruction in the future.	1	2	3	4	5
I plan to use Educational Technology in the mathematics classroom instruction future.	1	2	3	4	5