A Study of Preschool Teacher's Self-Efficacy and their Attitudes Towards the Use of Technology in Classroom.

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ENNICE NG TZE YIE

Declaration

I declare that the material contained in this paper is the end result of my own work and that due acknowledgement has been given in the bibliography and references to ALL sources be they printed, electronic or personal.

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This research paper attached here to, entitled “The Relationship Between Preschool Teacher’s Self-Efficacy and their Attitudes Toward the Use of Technology in Classroom” prepared and submitted by Ennice Ng Tze Yie in partial fulfilment of the requirements for the Bacheor of Early Childhood Education (Hons) is hereby accepted.

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Abstract

The COVID-19 pandemic significantly increased the importance of information and communication technologies (ICT) in education, including digital inequality and lack of skills. In early childhood education, integrating technology has become a practical necessity, highlighting the need to understand what shapes teachers' attitudes toward using these tools. However, there is limited research demonstrating the relationship between teacher's self-efficacy and their attitudes towards technology use, particularly in the context of Malaysia early childhood education. The Bandura's Self-Efficacy Theory and Technology Acceptance Model (TAM) was used as the theoretical framework in this study for investigating the research questions and hypothesis. Furthermore, this study employed a quantitative correlational research design with Teacher Self-Efficacy Scale (TSES) and the Scale of Attitudes Toward Using Technological Tools in Preschool Education being used as the research instruments to collect the data. 60 respondents had participated in the current study with the use of convenience sampling method. The research findings revealed a positive signification correlation between efficacy in student engagement ($r = .389$, $p = .002$), instructional strategy ($r = .445$, $p = <.001$) and classroom management ($r = .424$, $p = <.001$). These results indicate teachers with higher self-efficacy are more likely to adopt technology in the classroom, using it to enhance student engagement, employ diverse instructional strategies, and improve classroom management, ultimately creating more effective and interactive learning environments. There are few limitations to the current study which includes the high reliance on self-reported data, limited generalizability and the convenience sampling that is less representative. Hence, it is recommended to consider observational and interviews research design, collect larger samples and employ a random sampling method in future studies.

Key Words: Teacher's Self-Efficacy, Attitudes Towards Technology, Student Engagement, Instructional Strategy, Classroom Management

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List of Abbreviations

ICT Information Communication and Technology

TAM Technology Acceptance Model

TSES Teacher's Self-Efficacy Scale

Chapter I

Introduction

Introduction

This chapter will provide detailed information on the introduction of the topic chosen. Based on the topic, a background of the topic is written, followed by the problem statement focusing on the description of this study's knowledge gap. Research objectives, questions, and hypotheses are included, as well as information about the significance of the study and the definition of terms to clarify the key terms used in this study.

Background of Study

Information and communication technologies (ICT) have always been a debatable topic to be discussed and recently, it had a sharp rise in value during the COVID-19 epidemic, which had an impact on educational perspectives and practices (Clipa et al., 2023). Even while the internet has been appreciated for allowing individuals to maintain normal lives, the pandemic highlighted digital inequality and the lack of skills that many people had, which contributed to the crisis's negative impacts. As for educators, they were introduced to a new chapter where digital skills are a practical need rather than merely an interpersonal development to implement an innovative educational model (Sánchez-Cruzado et al., 2021). This phenomenon is not just seen in elementary, secondary, and higher education only, it is also present in early childhood education as well. In early childhood education, the use of technology presents unique opportunities and challenges, making it essential to understand the factors that influence teachers' attitudes regarding technological integration.

An individual's sense of self-efficacy can be defined as the belief in one's ability to plan and organize capabilities effectively under challenging and unpredictable circumstances (Maddux, 2012). In the context of teaching, teachers' sense of self-efficacy refers to their confidence in their ability to successfully manage the responsibilities, challenges, and tasks

associated with their professional activities (Barni et al., 2019). This self-efficacy plays a crucial role in stress management and job satisfaction. Teachers who believe in their abilities are more likely to cope effectively with the demands of the profession, reducing the likelihood of burnout and enhancing their positive attitudes towards their job (Cansoy et al., 2017). This is particularly important in preschool settings, where teachers often work with young children at a fundamental stage of development, requiring high levels of patience and adaptability. Additionally, high self-efficacy in teachers is linked to greater enthusiasm for teaching, an increased willingness to implement innovative practices, and a higher level of resilience when facing challenges (Zee & Coomen, 2016). Therefore, these teachers are more likely to adopt interactive and engaging educational practices essential for children (Yeşilyurt et al., 2016) while also being better equipped to create learning environments that cater to diverse student needs by proactively seeking and utilizing new teaching methods and technologies to enhance the learning experience for preschool children (An, 2018; Clark & Newberry, 2018; Nordlöf et al., 2017).

Moving on, the attitudes toward the use of technology are the overall emotional response to utilizing technology, which reflects the user's particular emotional experience with the gadget (Pan, 2020). In the context of the education field, teachers' attitudes toward technology play a significant role in understanding whether they will adopt and integrate technological-related methods and tools in their classrooms (Akram et al., 2022). Those who hold positive attitudes often lead to higher acceptance and utilization of technology (Ibrahim & Shiring, 2022), while those with negative attitudes may hinder its potential success. As the advancement of educational technologies is developing at a rapid speed, understanding the factors that influence these attitudes is essential to ensure that educators keep informed about the latest trends (Harell & Bynum, 2019). One such factor is self-efficacy, or the belief in one's ability to execute tasks successfully, which has been identified as a critical determinant of behavior

(Harell & Bynum, 2019; Bandura, 1997). Hence, examining the relationship between teachers' sense of efficacy and their attitudes toward technology in preschool education in crucial.

Problem Statement

Despite the increasing recognition of the importance of technology in early childhood education, there is a significant gap in the research examining the relationship between preschool teachers' sense of efficacy and their attitudes toward the use of technology in classrooms. While extensive studies conducted within local settings have explored self-efficacy in general educational settings, such as teacher commitment and job satisfaction (Mokhtar et al., 2023;), school organization climate (Mansor et al., 2021), mental well-being (Guoyan et al., 2021), educators' professional qualifications (Zainudin & Bakar, 2023); and the integration of technology in education (Bujang et al., 2020 & Kamaruddin et al., 2017), there is limited empirical evidence that specifically addresses how teachers' self-efficacy influences their attitudes towards and effective use of technology. This gap is particularly critical as early childhood education presents unique challenges and opportunities for technology integration, which can significantly impact teaching practices and student learning outcomes (Kara & Cagiltay, 2017). It is important to understand this relationship to plan for programs that promote teachers' competencies in using technology (Xie et al., 2022), hence promoting more effective and innovative educational practices in preschool classrooms and supporting digital tools for enhancing young children's learning experiences.

Nevertheless, there is notable lacking research examining the relationship between preschool teachers' sense of efficacy and their attitudes towards the use of technology in early childhood classrooms. The majority of existing studies in Malaysia on teacher efficacy and technology usage have predominantly focused on primary, secondary, and higher education contexts (Al-Daou, 2016; Clipa et al., 2023; Omar & Noor, 2021). These studies highlight the

critical role of teacher self-efficacy in successful technology integration, yet their findings are not fully applicable to the contexts of early childhood education. Preschool teachers operate in environments that require distinct pedagogical approaches, developmental considerations, and classroom management strategies (Pianta et al., 2016). Thus, their experiences and attitudes toward technology use may differ significantly from those of teachers at higher educational levels, and the gap in this area limits the understanding of how preschool teachers' self-efficacy influences their willingness and ability to integrate technology effectively (Birisci & Kul, 2019). In general, addressing this gap can develop supportive interventions and professional development programs that fulfill the needs of early childhood educators, enhancing the quality of technology-integrated learning experiences for young children.

Research Objectives

The main objective of this study is to examine the relationship between preschool teachers' sense of self-efficacy in 3 dimensions and their attitudes toward the use of technology in the classroom. In general, the objectives of this research are as follows:

1. To investigate the relationship between preschool teachers' self-efficacy in student engagement and their attitudes toward the use of technology in classrooms.
2. To investigate the relationship between preschool teachers' self-efficacy in instructional strategy and their attitude toward the use of technology in classrooms.
3. To investigate the relationship between preschool teachers' self-efficacy in classroom management and their attitudes toward the use of technology in classrooms.

Research Questions

This study focuses on the following questions:

1. Is there a significant relationship between preschool teachers' self-efficacy in student engagement and their attitudes toward the use of technology in classrooms?
2. Is there a significant relationship between preschool teachers' self-efficacy in instructional strategy and their attitudes toward the use of technology in classrooms?
3. Is there a significant relationship between preschool teachers' self-efficacy in classroom management and their attitudes toward the use of technology in classrooms?

Research Hypothesis

The hypothesis is predicted and investigated as follows:

H_A1: There is a significant relationship between preschool teachers' self-efficacy in student engagement and their attitudes toward the use of technology in classrooms.

H_A2: There is a significant relationship between preschool teachers' self-efficacy in instructional strategy and their attitudes toward the use of technology in classrooms.

H_A3: There is a significant relationship between preschool teachers' self-efficacy in classroom management and their attitudes toward the use of technology in classrooms.

Significance of Study

The significance of this study lies in its potential impact on educators, school principals, and educational management. By exploring the relationship between preschool teachers' sense of efficacy and their attitudes toward the use of technology in the classroom, this research offers valuable insights into how teacher confidence and technological attitudes can influence teaching practices in classrooms (Clipa et al., 2023). For educators, the findings of the study highlight how critical it is for them to foster a profound sense of self-efficacy and acceptance

of technology, as these qualities can significantly enhance their teaching strategies and general self-confidence in the classroom (Clipa et al., 2023; García-Martín et al., 2023). It provides guidance for the development and implementation of professional development programs that not only boosts teachers' self-efficacy but also improve their proficiency with technology related use (Williams et al., 2023). By supporting such programs, preschools can ensure that educators are better equipped to integrate innovative teaching methods and new technologies, eventually leading to more effective and engaging learning experiences for the children. Additionally, the insights gained from this research also help school principals and management make decisions about investing in professional development and technological resources, thereby creating a more supportive and technologically integrated educational environment (Johnson et al., 2016).

Moving on, by exploring this relationship, the research aims to provide valuable insights into how teachers' confidence in their own abilities influences their openness to adopting and integrating technological tools into their teaching practices. Therefore, understanding this dynamic is important for designing targeted professional development programs that address specific areas where teachers may lack confidence or competence in technology. It guides these preschool principals and educational management in creating a more supportive work environment that fosters self-efficacy and promotes technological innovation (Johnson et al., 2016). As a result, this leads to enhanced teaching practices and improved learning outcomes for preschool children. By aligning professional development with the identified needs and attitudes of teachers from the insights of this study, leaders can better support teachers in their efforts to effectively incorporate technology, contributing to the advancement of quality early childhood education.

Definition of Terms

Conceptual Definition

Self-efficacy: Self-efficacy describes an individual's subjective view of themselves and their capacity to flexibly structure their social, cognitive, and behavioral abilities and overcome challenges in a way that provides good outcomes (Bandura, 1984; Galvez-Nieto et. al, 2023).

Attitudes Towards Technology Use: The attitudes towards technology use refer to a person's subjective response of negative or positive, that reflects their emotional experience when using technology (Pan, 2020)

Preschool Teacher: A preschool is referred to as a structured learning environment or a premises that provides early childhood education to children from 0 to 6 years old before they enter into primary school's curriculum (Sattar & Taimur, 2019). Hence, preschool teachers are defined as the person providing early childhood education to these children.

Operational Definition

Preschool Teachers' Self-efficacy: In this study, Teacher Self-Efficacy Scale (TSEC) is used to describe this term. It shows how teachers feel about their abilities in the classroom and how that confidence influences their teaching methods in its three subscales of student engagement, instructional strategy, and classroom management (Tschannen-Moran & Hoy, 2001).

Efficacy in Student Engagement: The operational definition for this term is the teacher's confidence in their capacity to actively engage students in learning as an educator. It reflects their belief that engaging students, maintaining their interest, and encouraging meaningful engagement are essential methods to help children perform their tasks appropriately, demonstrating confidence and appreciating own skills (Tschannen-Moran & Hoy, 2001).

Efficacy in Instructional Strategy: The extent to which a teacher's teaching techniques provide the desired educational results is referred to as instructional strategy efficacy. It involves using efficient methods that improve comprehension, participation, and performance of students and are tailored to fit a range of requirements and learning preferences (Tschannen-Moran & Hoy, 2001).

Efficacy in Classroom Management: The operational definition for the term Efficacy in classroom management is a teacher's skill in guiding students to follow rules while supporting their emotional and behavioural self-control. It involves setting clear expectations, applying consistent discipline, and creating a positive learning environment that encourages students to manage their own behaviour and engage effectively in class (Tschannen-Moran & Hoy, 2001).

Preschool Teachers' Attitudes Towards Technology use: In this study, the Scale of Attitudes Toward using Technological Tools in Preschool Education are used to define preschool teachers' attitudes towards the use of technology classroom while teaching preschoolers (Kol, 2012).

Preschool Teacher: In this study, preschool teachers refer to early childhood educators who are teaching children from 4 to 6 years old in Selangor, Malaysia.

Conclusion

In conclusion, Chapter One has introduced the foundation of this study by providing a comprehensive overview of the topic, which is examining the relationship between preschool teacher's self-efficacy and their attitudes toward the use of technology in classroom. It includes the background of the study that established the context and relevance, while the problem statement highlights the knowledge gap this research aims to address. Then, the research objectives, questions, and hypotheses were outlined as guidance for the research. Additionally,

the significance of the study was discussed to emphasize its potential contributions to educators, principals and management. Also, key terms were defined to ensure clarity throughout the research. This chapter sets the stage for the subsequent exploration and analysis of the topic.

Chapter II

Literature Review

Introduction

This chapter presents an overview of previous research relevant to understand the topic of this study and to identify the research gap. It then covers a theoretical framework under the sense of self-efficacy and attitudes toward the use of technology and ends by formulating a conceptual framework for the study.

Subtopics

Teachers' Self-Efficacy

According to Bandura (1997), an individual's self-efficacy is the belief that they are capable of performing task successfully and achieving their gaols. It plays an important part in Bandura's Social Cognitive theory, suggesting that it have impact on one's motivation and behaviour (Williams & Rhodes, 2014; Tan et al., 2021). Hence, a teacher's self-efficacy can be referred as their confidence in their own ability to organize, plan and carry out necessary professionalism to complete every teaching responsibility (Barni et al., 2019). There are several factors studied and found to have influenced a teacher's self-efficacy, including their personal characteristics (Wray et al., 2022; Klassen & Tze, 2014), the necessary knowledge and skills to use technology in classrooms (Shukri & Matore, 2023), the degree of support received through principal and management leadership (Xie et al., 2022; Zainal & Matore, 2021) and more. These factors shape teacher's self-efficacy, which will then influence their confidence in their skills to manage the classroom, engage students, and implement effective instructional strategies (Tschannen-Moran & Hoy, 2001).

Highly efficacious teachers, which is those who believe in their own abilities, seem more likely to take on challenges and preserve in difficult situations (Clark & Newberry, 2018; Klassen & Tze, 2014). This can imply that these teachers are better able to perceive challenges

as an opportunity for further development, learning and advancement as they continue to thrive as an early childhood educator (Rodríguez et al., 2015). They tend to push through setbacks, and keep trying on new approaches and tools, such as the use of technology in classrooms. According to Rodríguez et al. (2015), these teachers' positive attitudes shaped by high self-efficacy advocates continuous development and innovation in their teaching practices, leading to beneficial outcomes for both teachers and students in classrooms. On the contrary, low self-efficacy teachers who have doubts about their own skills, tend to walk away from difficulties and remain their status quo without desiring for improvements (Clark & Newberry, 2018; Klassen & Tze, 2014). Instead of seeking solutions to problems, they prefer to stick to what they know as they are afraid of changes that might bring risk of failure. Hence, they rarely take on risk or improvements, which leads to lowering the potential of positive changes (Zee & Koomen, 2016).

As introduced by Tschannen-Moran & Hoy (2001), teachers' self-efficacy can be examined through three key dimensions, that is student engagement, instructional strategy, and classroom management. Teachers' efficacy in student engagement can be refer to a teacher's belief in their ability to involve and motivate their students in the learning process (Gálvez-Nieto et al., 2023). Various research from the past states that teachers who demonstrate high level of efficacy in student engagement are more willing to enhance their student's curiosity and participation, making classrooms more engaging (Gomez et al., 2021). For instance, incorporating group discussions, hands-on activities, interactive tools and so on. They're not just merely delivering the content but also focused on making learning experiences relevant and fun, allowing their students, leading to successful academic performance and attitudes (Bakar et al., 2016; Kareem et al., 2022). According to Kuorelahti et al., (2014), teachers who are low efficacy in student engagement are shown to be less interactive as they feel unsure on how to motivate their students. Same researchers also mentioned that without the confidence

needed to engage their students, these teachers may rely more on teacher-cantered teaching method and hesitate to use new strategies. As a result, limiting their potential in creating an engaging learning environment.

Moving on, teacher's efficacy that focused on instructional strategy is their belief that they can effectively employ various kinds of teaching strategies to help students learn in classrooms (Gálvez-Nieto et al., 2023). These teachers are more adaptable and innovative in their approaches, which means that they are more likely to try out new teaching strategies to meet the diverse learning needs of their students and continuously enhance their methods for better student outcomes (Poulou et al., 2018; Kurosh & Yousefi, 2020). However, teachers who are low efficacious is this area are shown to be less adaptive, sticking to their original methods even though it might now be working well for their students to thrive (Bedir, 2015). Research by Kim and Seo (2018) has stated that this resistance of using innovative tools that might improve classroom outcomes are due to the lack of relevant skills and confidence required to utilize them properly. As a result, their students will have fewer opportunities to experience diverse teaching strategies that might suit to their individual needs and learning styles, potentially leading to negative learning outcomes such as lower engagements in classrooms, unmanageable behaviours and so on (Kim & Seo, 2018).

Furthermore, a teacher's confidence in themselves to effectively maintain control and handle student behaviours in classroom is referred to as efficacy in classroom management (Gálvez-Nieto et al., 2023). Teachers with a high classroom management efficacy feel that they are capable of having control over their classroom structure, which strengthen their idea to adopt new tools without worrying about disruptions (Coban & Atosy, 2019). In other words, these teachers view new tools as supportive tools that assist them in classroom management skills rather than risk of distraction for students. Therefore, their positive mindset will lead to

an advanced, well-managed classroom environment where both teacher and student can thrive positively. In contrast, a low classroom management efficacy teacher will demonstrate fearfulness and struggleless when it comes to maintaining control in classroom (Aloe et al., 2014). Without the confidence they need to control a classroom, such teachers are less likely to adopt innovative methods because they feel secure without change (Coban & Atosy, 2019; Ghavifekr & Rosdy, 2015). They may perceive new tools as a potential source of chaos, bringing distractions and disruptions into the classroom that will lead to unmanageable situations.

Attitudes Towards the Use of Technology

A person's negative or positive response when using technological tools is defined as their attitudes towards using technology (Pan, 2020). As an educator, it is important to examine their attitudes towards the use of technology in classrooms because it determines how well they will integrate technology or digital tools into their teaching practices. When a person has a positive attitude toward technology, it will usually link with a higher likelihood of incorporating it into lessons to enhance educational outcomes (Dhendup & Sherab, 2022).

Several researchers had studied the factors that affects a teacher’s attitude towards using technology, including demographic characteristics (Tran et al., 2023; Islahi & Nasrin, 2019), previous experience with digital tools (Martínez et al., 2020), access to technology (García-Martín et al., 2023), perceived usefulness and perceived ease of use (Alharbi & Drew, 2018), and more. Some past research revealed that teachers who experienced positively with technology or who feel confident in their ability to use it tend to have more favourable attitudes. These teachers usually perceive technology as a supportive resource that can promote learning, facilitate student engagement, and support individualized instruction (Lixia, 2024). In other words, they have more intention to explore with new tools, adapting technologies to meet the

needs of their students, clearly understanding that it is an essential component of modern teaching (Lixia, 2024; Cutajar, 2018). However, having negative attitudes toward technology can be trailed from feeling inadequacy to fear of disruption (Papadakis, 2022). Teachers with insufficient digital competence or lack access to reliable technological resources may feel overwhelmed and resist to use technology in the classroom. Not to mention that those who perceive technology as difficult to manage or disruptive to classroom order may avoid integrating it into their teaching, even when resources are available (Papadakis, 2022). This resistance can lower the chance of exposure for students to innovative and interactive learning experiences, which limits the potential benefits technology can bring to education practices (D'Angelo, 2018).

Also, teacher self-efficacy has been examined in several research that it plays a significant role in affecting one's attitudes toward technology (Alharbi & Drew, 2018). Teachers with higher self-efficacy, particularly in areas like classroom management, student engagement, and instructional strategies, are more likely to have positive attitudes toward technology (Reyes & Del Valle, 2023; Alharbi & Drew, 2018; Nordlöf et al. 2017; Tschannen-Moran & Hoy, 2001). These teachers feel confident that they can manage any challenges that come with integrating technology, and they are more likely to view digital tools as assets rather than distractions. Conversely, teachers with lower self-efficacy may be less inclined to use technology, viewing it as an additional hurdle they are ill-equipped to handle (Klassen & Tze, 2014). The literature also suggests that teacher training and professional development play a crucial role in shaping teachers' attitudes and self-efficacy toward technology integration. Providing constant support and training regarding the effective use of technology in the classroom can help increase teachers' confidence and willingness to incorporate technology into their teaching practices (Williams et al., 2023; Johnson., 2016)

Diving into the context of early childhood education, their attitudes toward technology can have a direct impact on how they adopt and use technological resources to create engaging and developmentally appropriate learning experiences for young children (Lixia, 2024). Preschool teachers with positive attitudes are more likely to use technology in ways that align with developmentally appropriate practices, such as interactive play, supporting early literacy, and promoting social skills through collaborative digital activities (Erdoğmuş, 2021). In contrast, those with negative attitudes may limit or avoid using technology, taking away valuable opportunities from children to develop digital literacy skills at an early age.

In general, teachers' attitudes toward technology showed evidence to be influenced by their experiences, perceptions of usefulness and ease of use, and self-efficacy. Since positive attitudes can lead to more effective technology integration in classrooms by enhancing student engagement and learning outcomes, it is crucial to understand the role of teacher's attitudes towards the use of technology and the factors contributing to it. As technology continues to become a more integral part of education, fostering supportive attitudes among preschool teachers is key to maximizing its potential in early childhood education.

The Relationship between Self-efficacy and Attitudes Towards the use of Technology

There are several studies that have investigate into the relationship between teachers' self-efficacy and their attitudes toward the use of technology. A significant study done by Nordlöf et al. (2017) in Swedish had examined technology and teachers, which results shown a significant positive correlation between teachers' self-efficacy and their attitudes toward using technology in classrooms. The Pearson correlation analysis method indicates a medium, almost high positive relationship ($r = .45$, $p < .001$), representing that the teachers in the study with a high self-efficacy in student engagement and classroom management are more likely to view technology as a beneficial tool for engaging students, creating a learning environment

that facilitates their student's experiences (Nordlöf et al. 2017). This study had emphasized the importance of self-confidence in influencing teachers' perspectives toward the use of technology in education practices. Similarly, Reyes & Del Valle (2023) conducted another research to investigate how preschool teachers' self-efficacy impacts their use of technology in teaching and engaging students in the subject of English. Their study found that teachers with higher self-efficacy were more likely to integrate technology effectively into their teaching practices, which increases their abilities in instructional practices. Reyes & Del Valle (2023) had used Pearson correlation analysis, revealing a statistically significant positive correlation ($r = .58$, $p < .01$) between teachers' self-efficacy and their use of technology. Supporting the study done by Nordlöf et al. (2017), one's increased confidence in technological skills can be associated with more positive attitudes towards technology and its application in learning environment.

Moving on, research done by Hartell et al. (2015) had investigate the attitudes of teachers in high schools using technology in terms of assessment tools. Their studies discovered that those with high self-efficacy in classroom management were more likely to adopt new technological tools. Briefly explained, Hartell et al. (2016) study emphasized that teachers who feel confident and capable of aligning the assessment with the curriculum and maintain control in classrooms, tend to show higher willingness in using technology ($r=.45$, $p<.01$). This finding reinforces the idea from Nordlöf et al. (2017) and Reyes & Del Valle (2023)'s research that higher self-efficacy is associated to more favourable attitudes toward technology, which can lead to adopting innovative teaching practices.

To add on, a significant study by Kurosh and Yousefi (2020) explored the relationship between teachers' self-efficacy and their instructional strategies across different kinds of disciplines, including soft sciences, hard sciences, and EFL teaching. The research employed a

Pearson correlation analysis to investigate these relationships, resulting a strong positive correlation between self-efficacy and instructional practices among soft and hard science teachers, ($r = .65$, $p < .001$). This finding indicates that teachers with high self-efficacy are more likely to adopt effective instructional strategies, such as technological tools, thereby improving classroom teaching practices. However, for EFL teachers, the correlation was weaker and not statistically significant, suggesting that other factors that may have influence their attitudes toward using innovative tools in their instructional practices (Kurosh & Yousefi, 2020).

In addition, there is also past research context done in Malaysia that explores the role of self-efficacy in affecting attitudes toward using technology. A key study by Zainal and Matore (2024) looks into how self-efficacy and transformational leadership influence teachers' innovative behaviour, which provides valuable insights into the broader context of technology use in education. Their research highlights that self-efficacy significantly impacts teachers' willingness to engage in innovative practices, including the adoption of new technologies. Teachers who have a strong belief in their own abilities to engage students, employ effective instructional strategies and maintain sense of control in classrooms are more likely to embrace and integrate technology into their teaching practices (Zainal and Matore, 2024). Another research also conducted in Malaysia, focus on how organizational climate have impact on teacher’s efficacy. Mansor et al. (2021) explored how school climate in different dimensions can affect teachers' self-efficacy, finding the result of positive school climate significantly enhances teachers' self-efficacy, which in turn influences their attitudes towards adopting technology. The study revealed that supportive administrative practices and positive collegial relationships foster a conducive environment for building self-efficacy, which correlates with more favourable attitudes towards integrating technology in the classroom (Mansor et al., 2021).

Besides, looking through a different angle, researchers such as Fernández-Batanero et al. (2024) conducted an important literature review on educational technology's impact on teacher stress and anxiety, which indirectly illustrates how an individual's self-efficacy had influenced their attitudes towards technology use. The key findings of the study found that teachers who have a higher self-efficacy in using technology tend to experience less stress, which means that they were more likely to have positive attitudes towards using technology in their classrooms to motivate their students and enhance their instructional practices. The researchers from this study also indicated that increased self-efficacy helps to sooth teacher's technology-related stress, contributing to more favourable attitudes towards its use (Fernández-Batanero et al., 2024).

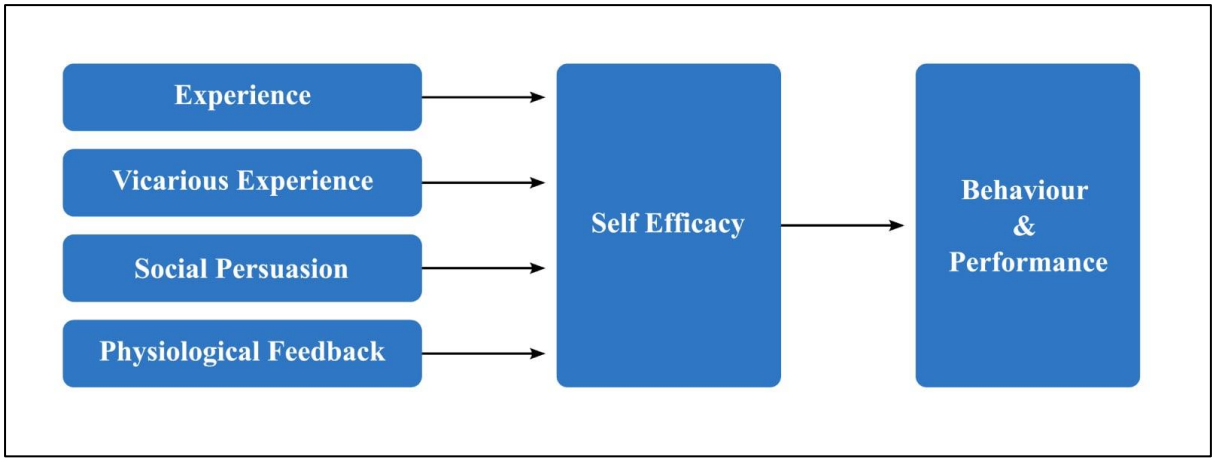
Furthermore, these studies examined how self-efficacy can impact one's attitudes towards technology, applying with the Technology Acceptance Model (TAM). Holden and Rada (2024)'s study shown how teacher's perceived usability and technology self-efficacy influence their technology acceptance level. It is found out that technology self-efficacy significantly influences teachers' attitudes towards technology use. Teachers with higher self-efficacy, or confidence in their ability to incorporate technology, demonstrated more positive attitudes. As evidence, the study revealed a high positive relationship ($p < .001$) between self-efficacy and positive attitudes towards technology, indicating that increased self-confidence enhances teachers' acceptance to technology (Holden & Rada, 2014).

In general, these studies collectively emphasized the positive relationship between teachers' self-efficacy and their attitudes toward technology in classrooms. Teachers who feel confident in their teaching abilities are more likely to embrace technology as a valuable tool for improving student learning outcomes, while professional development plays a crucial role in enhancing both self-efficacy and attitudes toward technology integration.

Theoretical Framework

Figure 1

Albert Bandura's Self-Efficacy Theory



Note: Source form Simply Psychology. *https://www.simplypsychology.org/self-efficacy.html*

The framework above shows the Bandura's Self-Efficacy Theory, which is a key component of his broader Social Cognitive Theory. This theory of his emphasizes the role of belief in personal abilities as a major factor influencing behaviour and motivation (Lopez-Garrido, 2023), which provides a theoretical framework for understanding the relationship between preschool teachers' sense of efficacy and their attitudes toward the use of technology in the classroom. According to Albert Bandura, self-efficacy refers to an individual's belief in their capability to perform specific tasks successfully (Bandura, 1984). This theory emphasizes that individuals with high self-efficacy are more likely to engage in tasks, persist in the face of challenges, and adapt to new demands (Artino, 2014). This belief in personal competence affects not only behaviour but also emotional reactions, such as how much stress or anxiety a person experiences in challenging situations.

In this theory, Bandura had identified 4 primary sources for efficacy, including ***mastery experiences, vicarious experiences, social persuasion and psychological feedback*** (Lopez-

Garrido, 2023). First and foremost, the most influential source is the ***mastery experiences***, which is an individual's personal experience of success. When one succeeds in a task, it boosts their confidence to take on similar challenges. Conversely, repeated failures can undermine self-efficacy (Artino, 2014). Then, ***vicarious experiences*** source refers to the process of gaining self-efficacy from observing other people, meaning that an individual's confidence in their ability to perform a task can be strengthened when they witness someone else complete it, particularly if they think the other person is more capable than they are ***feedback*** (Lopez-Garrido, 2023). The following source of ***social persuasion*** is the positive reinforcement or feedback that people receive from others that could make individuals feel more capable of succeeding (Kundu, 2020). People's self-efficacy is strengthened when they are convinced that they can complete a task by peers or trustworthy adults, especially if this is associated with mastery experiences (Borgert et al., 2024). For the last source, ***psychological feedback*** can be determined as the emotional and physical responses, such as stress, anxiety, or excitement, that individuals experience when engaging in tasks (Kundu, 2020). These responses influence a person's belief in their ability to succeed, with positive emotions enhancing self-efficacy and negative emotions, like high stress, potentially weakening it (Beattie et al., 2015). Managing these emotional and physiological states can help boost self-efficacy.

Application of Bandura's Self-Efficacy Theory into Current Study

According to Bandura's self-efficacy theory, an individual's self-efficacy, or the belief in their abilities, is a key factor in determining how they feel about performing tasks. It's not only about whether an individual dual can do a task, rather, it's about believing that they can use those abilities to perform those tasks in a variety of settings (Bandura, 1997). This belief directly impacts individuals' views to handle difficulties, how persistent they are in the face of failures, and how resilient they are overall. Therefore, self-efficacy has significant impacts

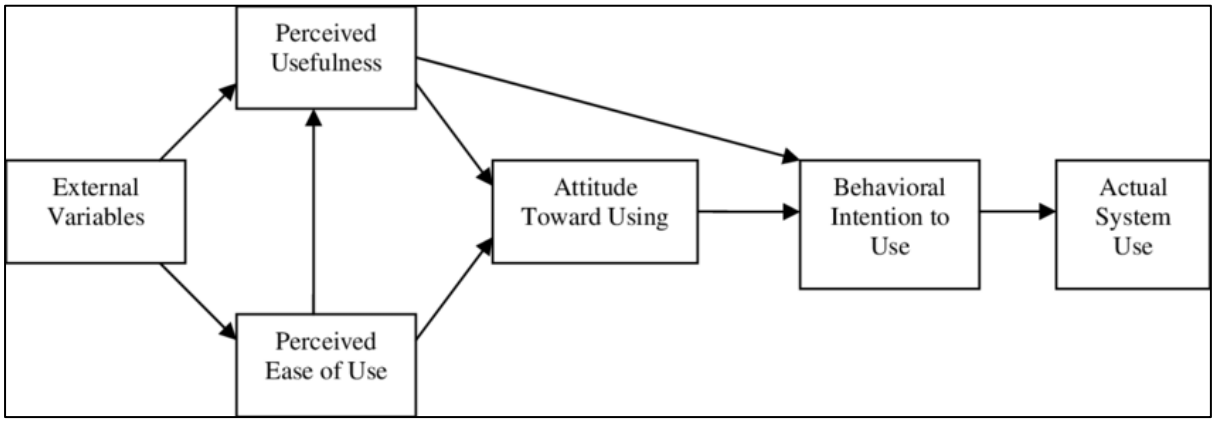
on motivation, behavior, and general attitude towards a task, influencing both their ability to carry out and their desire to continue regardless of difficulties (Schwarzer & Warner, 2012).

In the context of teaching, Bandura's theory suggests that teachers with high self-efficacy are more likely to have positive attitudes toward complex or challenging tasks (Shahzad & Naureen, 2017). This belief can be agreed upon based on past literature, in which high-efficacy teachers show positive attitudes toward inclusive practices (Yada et al., 2022; Meidrina et al., 2017), and curriculum change (Gordon et al., 2022). Thus, teachers with high self-efficacy are more inclined to see technology as a useful tool to enhance learning and engage students in new ways (Emiru & Gedifew, 2024). They are willing to invest time and effort into learning how to use technology effectively, believing they can master it and make it work for their students. In contrast, teachers with lower self-efficacy may view technology as overwhelming or unnecessary, leading to resistance in adopting it in their teaching practices (Clark & Newberry, 2018; Klassen & Tze, 2014). This attitude stems from a lack of confidence in their ability to adapt their teaching style to incorporate new digital methods. In preschool education, teachers' sense of efficacy directly influences how confident they feel in managing children and incorporating new tools and technology into their teaching methods (Keser et al., 2015). Those with high self-efficacy view technology integration as an opportunity, believing they can effectively adapt it to developmentally appropriate activities (Birisci & Kul, 2019). They are also more likely to seek professional development opportunities and experiment with various tools to foster creativity and engagement in the classroom. On the other hand, preschool teachers with low self-efficacy may demonstrate a negative attitude towards technology, perceiving it as too complex for young students or requiring skills they lack (Keser et al., 2015). As a result, they tend to avoid using technology, relying more on traditional teaching methods due to their lack of confidence in exploring and implementing digital tools (Birisci & Kul, 2019).

Furthermore, research such as Capa-Aydin et al. (2018) and Srisupawong et al. (2017) has mentioned that teachers' efficacy can be strengthened to improve their attitudes towards technology through mastery experiences, vicarious experiences, social persuasion, and emotional regulation. In terms of mastery experiences, preschool teachers who are provided with opportunities to succeed in using technology are likely to build confidence in their skills, thereby developing a more positive attitude towards using technology (Capa-Aydin et al., 2018). Also, observing other teachers who successfully integrate technology into their teaching can also motivate teachers, showing them that they too can overcome challenges and improve their technological competence, which is the source of vicarious experiences (Capa-Aydin et al., 2018). Next, social persuasion, such as encouragement from school leadership or positive feedback from colleagues, can reinforce a teacher's belief in their ability to effectively use technology (Srisupawong et al., 2017). Emotional regulation also plays a role, as teachers who feel less stressed or anxious about technology will be more open to using it. Therefore, a supportive work environment that provides teachers with the resources and reassurance they need can enhance their self-efficacy and, in turn, foster a more positive attitude towards the use of technology in the classroom (Capa-Aydin et al., 2018; Srisupawong et al., 2017).

Figure 3

Technology Acceptance Model (TAM)



Note: Source from The Electronic Journal of Information Systems in Developing Countries, 40(1), 1–19. https://doi.org/10.1002/j.1681-4835.2010.tb00288.x

Framework 2 above shows the Technology Acceptance Model (TAM), originally developed by Fred Davis, which examines and explains the factors influencing users' willingness to accept technology (David, 1989). In TAM, two primary factors are introduced that influence technology acceptance: *perceived usefulness (PU)* and *perceived ease of use (PEOU)*, which will then affect an individual's overall attitudes and intention to use a particular system that determines their actual usage of the system (Alharbi & Drew, 2018). This model has been widely applied in studies of various fields, including the political aspect of E-voting (Aljarrah et al., 2016), the educational context of student's perception of E-learning (Salloum et al., 2019) and web-based technologies (Ibrahim & Shiring, 2022), the healthcare domain in health information services (Rahimi et al., 2018) and telemedicine services (Kamal et al., 2020), and many more. Hence, focusing on TAM provides insights into the key factors of how an individual forms acceptance toward technology use.

Perceived Usefulness (PU) is the potential user's subjective chances that, in an organizational setting, adopting a certain application system will improve his or her work performance. If an individual feels that technology will provide visible benefits, they are more likely to develop a positive attitude toward using it (Alharbi & Drew, 2018). *Perceived Ease of Use (PEOU)*, on the other hand, refers to the level of effortlessness with which the user anticipates using the system. Simply said, it means if the system is easy to learn and implement, users are more likely to adopt it (Alharbi & Drew, 2018). Before that, there are distinct external factors or moderators of the two primary belief structures (PU, PEOU), which is the *External Variables,* such as personality and demographic traits (Marangunić & Granić, 2014). Together, perceived usefulness and ease of use shape the *Attitude Toward Using the technology*. If the

attitude is positive, it leads to a strong *Behavioral Intention to Use* the technology, which directly affects the *Actual System Use*.

Application of Technology Acceptance Model (TAM) Theory into Current Study

This study applies TAM to examine how individuals, particularly teachers or users in a specific context, interact with and adopt new technological tools. The central constructs of TAM—Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)—are critical to understanding the acceptance of technology in this setting. By focusing on these components, the study aims to show how teachers' perceptions of a technology system's utility and simplicity influence their intention to incorporate it into their practices.

External variables play a significant role in shaping teachers' perceptions of technology. In this study, these variables include the factor of self-efficacy, which affects how easy or useful technology appears to teachers. Studies from past literature have mentioned that self-efficacy has proven to influence Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (; Kulviwat et al., 2023; Alharbi & Drew, 2018; Marangunić & Granić, 2014; Holden and Rada, 2014). Hence, The TAM theory is applied in this study by associating the external influences of teachers' self-efficacy to explain a system use, specifically by assessing how it shapes attitudes toward using technology in classroom. For instance, teachers with higher self-efficacy may perceive educational technology as easier to use, thereby increasing their likelihood of adopting it in the classroom (Kulviwat et al., 2023).

The TAM framework also helps the study investigate how these attitudes translate into behavioural intention and actual system use (Liu et al., 2019). The current study extends TAM by not only examining teachers' perceptions but also testing the link between these perceptions and real-world classroom setting technology adoption. In doing so, the study seeks to illustrate the practical relevance of TAM in understanding technology implementation in classrooms,

offering insights into how technology acceptance can be facilitated through targeted interventions like training, increasing self-efficacy, and improving system usability.

Conceptual Framework

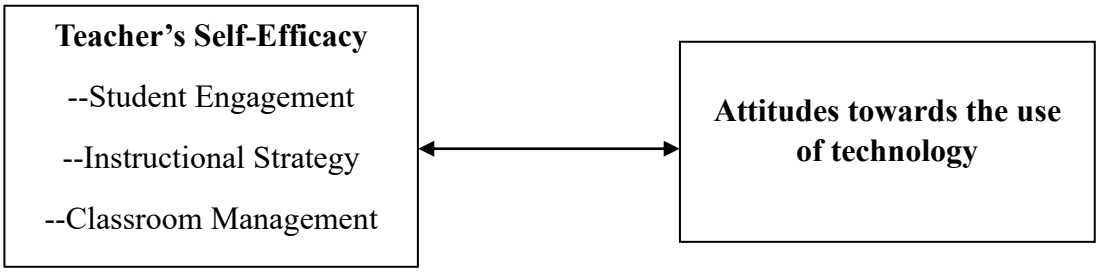


Figure 3: Conceptual Framework

Figure 1 shows the conceptual framework of this study, which shows that this study was carried out to examine whether preschool teachers' sense of efficacy in 3 dimensions has a relationship with preschool teachers' attitudes toward using technology in the classroom. Based on the theoretical framework employed in this study, this study had hypothesized that there is a significant relationship between preschool teachers' self-efficacy in the dimension of student engagement, instructional strategy, classroom management and their attitudes toward the use of technology in classrooms. Previous studies conducted in Malaysia and foreign countries shows that there is a significant relationship between self-efficacy and attitudes toward technology use (Clipa et al., 2023; Omar & Noor, 2021; Bakar et al., 2018), showing evidence that there is a correlation between self-efficacy and attitudes toward technology use in classroom.

Conclusion

To conclude, this chapter offers an essential context to understand the study's focus and identify existing research gaps, including teacher's self-efficacy in student engagement, instructional strategies and classroom management, the attitudes toward the use of technology and their relationships exists. It also discussed the theoretical framework cantered on self-efficacy and attitudes toward technology use, namely Bandura's Self-Efficacy Theory and Technology Acceptance Model (TAM). The conceptual framework of current study was developed to guide the study, synthesizing the theoretical perspectives and highlighting the relationship between teachers' self-efficacy and their attitudes toward using technology in educational settings.

Chapter III

Research Methodology

Introduction

This chapter discussed the research design, the sampling and respondents, a description on the research instruments used in this study, an explanation of the research analysis method and a description of the research procedure.

Research Design

A quantitative research method is employed by the researcher to examine the objectives in this study. Quantitative research is an approach that collects and analyse numerical information, finds trends and averages, generates hypotheses, examines correlation, and applies findings to larger groups (Bhandari, 2020). Generally, quantitative research involves the use of structured instruments such as surveys, questionnaires, or tests to gather data from a large sample, which is then analysed using statistical methods to draw conclusions or generalize about the population. The primary goal of quantitative research is to produce reliable and valid results that can be replicated and generalized to other settings or groups. In this survey, the instruments used to collect and analyse data are questionnaires that include the “Teacher Sense of Efficacy Scale” and “Attitudes Towards the Use of Technological Tools in Preschool Education”.

As for correlational research, it is a type of research design in which the researcher used in this study to measure two variables and evaluate the statistical relationship between them independent from external variables (Chiang et al, 2015). The correlational coefficient is a statistical measure that is used in this research design to express the strength and direction of the relationship between the two variables (Teacher sense of self-efficacy, attitudes towards the use of technology) (Bhandari, 2023). Its values range between -1 and 1. A complete negative, or inverse, correlation is expressed by a correlation coefficient of -1, where values in one series

increase while those in the other series decrease and vice versa. Then, a straight association, or complete positive correlation, is shown by a coefficient of 1; and when the correlation coefficient is 0, a linear link is absent (Fernando, 2024).

Sampling and Respondents

Population refers to the entire group of units or individuals consist of the characteristics being studied, and to which the research findings can be generalized (Shukla, 2020). The population in this research includes preschool teachers who are being employed in early childhood settings, such as public and private preschools, withing the state of Selangor. This includes areas such as Shah Alam, Sungai Long, Klang, Puchong and so on. A sample is a particular set of people chosen to represent the population; they are used in research to gather data and draw conclusions about large populations (Ahmad et al., 2023). Based on the population in this study, the researcher used a sample of 60 preschool teachers who are working in Selangor preschools.

To obtain the sample selected, a non-probability—Convenience sampling method is used by the researcher. This sampling technique chooses participants based on their availability and desire to participate instead of selecting them randomly from the whole population (Golzar et al., 2022). This sampling method is employed in this study as it allows the researcher to gather data quickly and more efficiently from participants who are readily available and willing to contribute (Andrade, 2020). It is useful in situations where the time or resources are limited, making it an accessible and cost-effective option.

Research Instruments

The research instrument used to collect the data for this study consists of 3 sections: Section A, Section B, and Section C. The questionnaire will be carried out online through Google Surveys, and physically through printouts.

Section A of the questionnaire reviewed the demographic details of the respondents who voluntarily took part in this study, which was created to collect information on their gender, age, educational level and teaching experiences. It also examines the availability of digital tools (DT) used in the classroom and if they had attended to any ICT training before. The possibilities for the age range include "below 20," "20-30," "31-40," "41-50," and "beyond 50,"; the gender range is "male" and "female."; whereas the options for teaching experiences are “0-5 years”, “6-10 years”, “11-20 years” and “over 20 years”.

Concurrently, to examine the respondents’ sense of self-efficacy, the Scale of Teacher Efficacy is used in Section B. This scale was designed and developed by Tschannen-Moran M. and Woolfolk Hoy A. (2001), aiming to evaluate the respondents' views of their likelihood of succeeding as teachers, with a particular emphasis on their ability to perform the tasks assigned and meet the goals of the class (Gálvez-Nieto et al., 2023). This scale is based on 12 items questions with 3 subscales, including student engagement (items 2, 3, 4, 11), instructional strategy (items 5, 9, 10, 12), and classroom management (items 1, 6, 7, 8), on a 9-point Likert-scale from 1=nothing to 9=a great deal. The level of self-efficacy can be calculated by adding up all the scores: The higher average scores indicate a stronger sense of teaching efficacy. The overall reliability confirmed a Cronbach alpha value of 0.90, while each subscale had a Cronbach alpha of: 0.81 for student engagement, and 0.86 for instructional strategies and classroom management (Tschannen-Moran & Hoy, 2001). The high reliability implies that the Teacher Sense of Efficacy Scale is consistent for data collection.

The Scale of Attitudes Toward the Use of Technological Tools in Preschool Education, developed by Kol (2012), is used in Section C of the questionnaire, to measure early childhood teachers’ attitudes toward using technology in teaching young children (Kol, 2012). It is a 5-point Likert scale that contains of 20 items questions in one dimension. Each item was scored by assessing to 1=totally disagree to 5=totally agree. There are 6 reversed questions items

(items 3, 6, 9, 11, 1, 16) and the score must be scored reversely before calculating the total scores (1=totally agree to 5=totally disagree). As a result, the score evaluation indicates that the applicable attitude towards the use of technological tools increases as the scale's total score rises. This scale is divided into distinct categories that group items according to various dimensions of teacher attitudes, which a score range of 1 to 2.33 indicates a lower attitude; 2.34 to 3.67 having a medium attitude; and 3.68 to 5 is considered to have a high attitude towards the use of technological tools (Konca et al., 2016). Furthermore, the reliability of the Attitude Scale Towards the Use of Technological Tools in Preschool Education confirmed a Cronbach alpha value of 0.92, demonstrating its dependability (Kol, 2012).

Data Analysis Method

In this study, the researcher uses two types of analysis methods to analyze the data collected, which include descriptive and inferential analysis. The descriptive analysis method produces brief summaries that highlight the key features of the research's data (Mishra et al., 2019), hence it is used by the researcher to analyze the descriptive statistics of the respondents' demographic profile, and the basic distribution of the two variables—teacher sense of efficacy and attitudes scale towards the use of technological tools in preschool education. This includes measuring the frequency, such as frequency and percentage of the demographic profile of gender, age, educational level, teaching experiences, availability of digital tools used in classrooms, and whether there is participation in any ICT training; and measuring the central tendency and variability, such as mean and Standard Deviation (SD). The measure of the mean is the mathematical average that calculates the sum of all the values and dividing it by the number of values in the dataset. While the Standard Deviation (SD) is used to calculate each score's average distance from the dataset, a greater data variability is demonstrated by a higher standard deviation (Hayes, 2024).

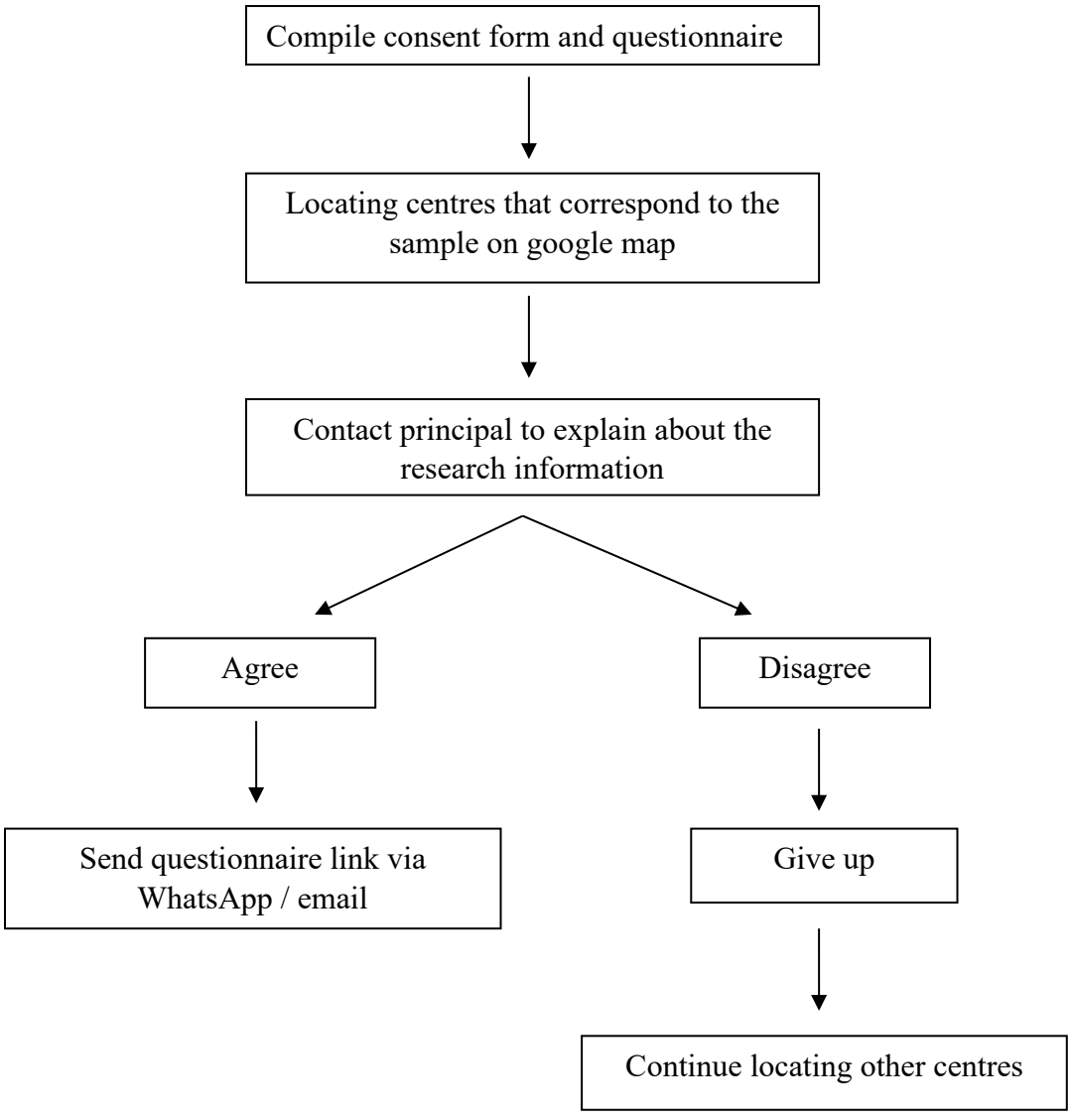
By understanding the based distributions from descriptive statistics, the researcher then utilizes inferential analysis—Pearson product-moment correlation coefficient (PPMCC) to measure the relationship between preschool teachers' sense of efficacy (IV) and their attitudes towards the use of technology in classrooms (DV). To measure the direction of the linear relationship between the two variables, the correlation coefficient (r) is used, with values ranging from -1 to 1 (Schober et al., 2018). A value of 1 indicates a positive correlation, meaning that the variables change in the same direction; while a -1 indicates a negative correlation, where the variables change in opposite manner. A value of 0 suggests that there is no relationship at all between the variables (Turney, 2024). As to quantify the strength of it, Cohen (1988, 1992) stated that a r value of ±.1 to ±.3 shows a small effect size; ±.3 to ±.5 shows a medium effect size; and ±.5 or greater shows a high effect size (McLeod, 2023). Also, a measurement of the p-value is used to verify the hypothesis of the research. When a p-value is less than .05, the relationship of the variables is significant and thus the hypothesis is not rejected.

Research Procedures

The research procedure begins by compiling a consent form and a detailed questionnaire, which are used for gathering data for this study. The next step involves locating early childhood education centers or preschools that align with the sample criteria using Google Maps, which is preschool teachers who are currently teaching 4 to 6-year-old children in the Selangor district. Once the potential centers are identified, the researcher will contact the principals of these centers to explain the details of this research, including research objectives, methods, and the significance of their participation. If the principals or centres agree to participate, the consent forms will be shared, and upon receiving their approval, the questionnaire link is sent to them via WhatsApp or email for distribution among the relevant participants. The consent forms include addressing the participant's privacy and confidentiality

to ensure they are informed consent when participating in the study. If any center declines participation, the researcher proceeds to locate and contact other suitable centers, repeating the process until the required sample size is met. This systematic approach ensures that the research is conducted efficiently while maintaining ethical standards and clear communication with all participants.

The data collection duration will take about 2 to 3 weeks, and after all 60 respondents is collected, the researcher will close the link for accepting any respondents in Google Survey. With the collected data, the researcher will complete the data analysis through IBM SPSS Statistics to summarize and report the key findings.



Conclusion

To summarize, this chapter has outlined the essential components of the research methodology. It began by discussing the research design employed in current study, which is a quantitative, correlational design. The selection of the sample and respondents was then explained, with 60 preschool teachers within Selangor area. The chapter also highlighted the research instruments of Teacher Self-Efficacy Scale (TSES) and Scale of Attitudes Toward Using Technological Tools in Preschool Education that were used to gather data. Additionally, this study will utilize a Pearson product-moment correlation coefficient (PPMCC) to demonstrate how the data will be interpreted. Lastly, the research procedure was described, offering an illustration on how the data were collected within the duration.

Chapter IV

Findings and Analysis

Introduction

This chapter of the research presents a detailed description of the descriptive and inferential statistics and analysis. The Statistical Package for Social Science (SPSS) was used to analyse the data. In this study, the researcher used the Pearson correlation data analysis method to test the hypothesis stated in study.

Descriptive Statistics and Analysis

The descriptive statistics shown in this study includes the frequency and percentage of the respondents' demographics value (gender, age, educational level, teaching experiences, availability of digital tools in classrooms and the attendance of any ICT training). Also, the mean and standard deviation of IV and DV will also be included.

Table 1

Respondents' Gender

Gender	Frequency (n)	Percentage (%)
Female	56	93.3%
Male	4	6.7%
Total	60	100.0

Table 1 presents the respondents' gender who had participated in this study. A total of 60 respondents are involved while 56 (93.3%) of them are females, followed by only 4 (6.7%) are males. This shows that majority of the respondents are female.

Table 2

Respondents' Age

Age	Frequency (n)	Percentage (%)
20 or below	2	3.3%
21-30	29	48.3%
31-40	22	36.7%
41-50	6	10.0%
51 or above	1	1.7%
Total	60	100.0

Table 2 displays the distribution of the respondents' age group. Majority of the respondents are aged 21 to 30 years old, which had a total of 29 (48.3%). It is then followed by the age group of 31 to 40 with 22 (36.7%); and 41 to 50 with 6 (10%) respondents. There are 2 (3.3%) of the respondents who are aged 20 years or younger, and only 1 (1.7%) respondent are 51 years old or older.

Table 3

Respondents' Educational Level

Educational Level	Frequency (n)	Percentage (%)
Diploma	13	21.7%
Postgraduate Degree	4	6.7%
SPM / STPM / UEC	8	13.3%
Undergraduate degree	35	58.3%
Total	60	100.0

Table 3 shows the educational level of the 60 respondents who participated in this study. According to the table, Degree holder preschool teacher respondents take up the most frequent percentage, which is 35 (58.3%) of them. Furthermore, 13 respondents (21.7%) have graduated with Diploma, while 8 (13.3%) respondents graduated with an SPM/STPM/UEC certificate. In addition, there are 4 (6.7%) respondents who have a post-graduate degree, either of Master or PhD. In general, the highest percentage group is Degree holder preschool teacher while the lowest percentage group is post-graduate holder.

Table 4

Respondents' Teaching Experience

Teaching Experiences	Frequency (n)	Percentage (%)
1-5 years	30	50.0%
6-10 years	21	35.0%
11-20 years	7	11.7%
Over 20 years	2	3.3%
Total	60	100.0

Table 4 shows the teaching experiences of the respondents, which 30 respondents (50%) had 0 to 5 years of teaching experience which hold the highest percentage in this study. In addition, 21 respondents (35%) had 6 to 10 years of teaching experience. Then, a total of 7 (11.7%) respondents had work as a preschool teacher for 11 to 20 years old. Similarly, there were only 2 respondents (3.3%) who had over 20 years of teaching experience. This group represents the lowest percentage of respondents in the study.

Table 5

Respondents' Opinions on the Availability of Digital Tools used in ECE classroom

ICT Training	Frequency (n)	Percentage (%)
Computer	44	73.3%
DVD	18	30.0%

According to table 5 above, it shows the respondents' Opinions on the Availability of Digital Tools used in early childhood classrooms. The results presented the digital tools with the highest score and lowest score, which computer having 44 respondents and DVD having only 18 respondents in total. This indicated that computers are highly available to use in classrooms, while the availability of DVD are low during teaching in classrooms.

Table 6

Respondents' self-evaluation towards the attendance ICT training

ICT Training	Frequency (n)	Percentage (%)
No	23	38.3%
Yes	37	61.7%
Total	60	100.0

Table 6 above displays the respondents' self-evaluation towards the attendance for any ICT training, which includes workshops, programmes, training and so on. The respondents can evaluate "yes" or "no", which 23 (38.3%) of them responded "No" as in they have not attended any ICT related training before. The rest of the respondents, which have 37 (61.7%) of the responded "yes" indicating that they had attended to ICT trainings before.

Table 7

Mean and Standard Deviation (SD) of Teacher's sense of Efficacy Scale and its subscales

		Mean	Std Deviation (SD)	Frequency (n)
Total TSES		7.1583	1.03433	60
Subscale	Student Engagement	7.1958	1.01794	60
	Instructional Strategies	7.1345	1.17118	60
	Classroom Management	7.1417	1.16022	60

Table 7 demonstrate the mean (M) and Standard Deviation (SD) of the individual variable (IV), which is teacher's sense of self-efficacy including its three subscales of "Student Engagement", "Instructional Strategies" and "Classroom Management". The sample size is N=60, which results showing that the mean and std. deviation of teachers' sense of self-efficacy are M=7.1583 and SD=1.03433. Among the three subscales, student engagement had the highest mean and lowest standard deviation (M=7.1958, SD=1.01794), followed by instructional strategies (M=7.1345, SD=1.17118) and finally classroom management with lowest mean but highest standard deviation (M=7.1417, SD=1.16022). These results indicates that the respondents in this study responded with similar scores.

Table 8

Grouping the points of Teachers' Attitudes towards the use of Technological Tools in Preschool Education.

Range	Group	Frequency (N)	%
1 – 2.33	Low	0	0
2.34 – 3.67	Moderate	19	31.7
3.68 – 5	High	41	68.3

Table 8 above shows the grouping points of teachers' attitudes towards the use of technological tools in preschool education. Based on the table above, most of the respondents falls on the score range of moderate group 3.68 to 5, which is 41 of them (68.3%). Then, it was followed by the remaining 19 respondents (31.7%) distribute in the score range of high group 2.34 to 3.67. There are no respondents at all who is in the low group of score 1 to 2.33.

Inferential Statistics and Analysis

To answer the hypothesis of the study stated, the inferential statistics include the correlation between efficacy in student engagement, instructional strategy, classroom management and the attitudes towards the use of technology in classroom.

Table 9

Correlation Between Teachers' Sense of Efficacy in Student Engagement and their attitudes towards the use of technology in classrooms.

	Frequency (n)	*p*	*r*
Total SE	60		
Total A	60	.002	.389**

Table 9 displays the correlation between sense of efficacy in the Student Engagement and their attitudes towards the use of technology in classrooms, which there is a significant positive relationship between the two variables (p=.002, N=60, r=.389). McLeod (2023) states that a p-value less than .005 calculate that the relationship is statistically significant, indicating that the hypothesis is accepted with a p-value of .002. Also, the result indicates an r-value of .389, which falls within the positive range of .3 to .5, indicating a medium effect size. This means that a preschool teacher with higher sense of efficacy in student engagement is associated with more positive attitudes towards the use of technology in classrooms.

Table 10

Correlation Between Teachers' Sense of Efficacy in Instrumental Strategies and their attitudes towards the use of technology in classrooms.

	Frequency (n)	*p*	*r*
Total IS	60		
Total A	60	<.001	.445**

Table 10 shows the correlation between efficacy in Instructional Strategies and the attitudes towards the use of technology in classrooms. The result indicates that there is a significant positive relationship between preschool teachers' sense of efficacy in instructional strategies and their attitudes towards the use of technology in classrooms (p=<.001, N=60, r=.445). McLeod (2023) states that a p-value less than .005 calculate that the relationship is statistically significant, indicating that the hypothesis is accepted with a p-value of less than .001. Also, the result indicates an r-value of .445, which falls within the positive range of .3 to .5, showing a medium effect size. This means that preschool teachers who evaluate in higher sense of efficacy in instructional strategies are linked with more positive attitudes towards the use of technology in classrooms.

Table 11

Correlation Between Teachers' Sense of Efficacy in Classroom Management and their attitudes towards the use of technology in classrooms.

	Frequency (n)	*p*	*r*
Total CM	60		
Total A	60	<.001	.424**

Table 11 shows the correlation between the the efficacy in Classroom Management and attitudes towards the use of technology in classrooms. The result displayed that there is a significant positive relationship between preschool teachers' sense of efficacy in instructional strategies and their attitudes towards the use of technology in classrooms (p=<.001, N=60, r=.445). McLeod (2023) states that a p-value less than .005 will result in a statistically significant relationship, indicating that the hypothesis is accepted with a p-value of less than .001. Also, the result indicates an r-value of .424, which falls within the positive range of .3 to .5, showing a medium effect size. This means that preschool teachers who evaluate in higher sense of efficacy in instructional strategies are more likely to have positive attitudes towards the use of technology in classrooms.

Summary

Summary of Findings

Hypothesis	*Result*	*Correlation*
H1: There is a significant relationship between preschool teachers' sense of efficacy in student engagement and their attitudes towards the usage of technology in classrooms.	r= .389, N= 60, p= .002	Accepted
H2: There is a significant relationship between preschool teachers' sense of efficacy in instructional strategies and their attitudes towards the usage of technology in classrooms.	r= .445, N= 60, p= <.001	Accepted
H3: There is a significant relationship between preschool teachers' sense of efficacy in classroom management and their attitudes towards the usage of technology in classrooms.	r= .424, N= 60, p= <.001	Accepted

Based on the summary above, it shows that there is a positive significant relationship between self-efficacy in all 3 subscales: student engagement, instructional strategy, classroom management and the attitudes towards the use of technology in classroom. Therefore, all the hypothesis of the study is accepted.

Chapter V

Discussion and Conclusion

Introduction

This chapter overview the discussion of the findings from descriptive and inferential analysis presented in chapter 4. Furthermore, an implication of the findings to broader population in covered and discussed, followed by the limitations of the study and the recommendations to improve.

Descriptive Analysis

According to the results and findings of the research, a total of 60 preschool teachers in Selangor area had participated in the current study. As presented in Chapter 4, most of the respondents' gender are female (93.3%), with majority of them falls to the category age of 21 to 30 years old (48.3%). It can be suggested that these teachers are young fresh graduates with a less than 5 years of teaching experiences (50%) in early childhood field. Speaking of teaching experiences, only a number of 9 teachers (15%) who have the experience of above 10 years. Furthermore, all o the respondents indicated that there were at least one technological tools available in their classrooms, with computer (73.3%) being the most accessible and DVDs have the least (30%). Also, findings also revealed that surprisingly more than half of the respondents have attended to any forms of ICT training (61.7%), although there is 38.3% of respondents have not.

Inferential Analysis and Discussion

Pearson correlation coefficient is used to examine the relationship between preschool teacher's self-efficacy and their attitudes towards the use of technology in classrooms. Preschool teacher's self-efficacy was tested separately based on three subscales, namely student engagement, instructional strategy and classroom management. The findings indicates that there is a medium effect positive significant correlation between teacher's self-efficacy and their attitudes towards the use of technology in classrooms, with student engagement ($r = .389$,

p= .002), instructional strategy (r= .445, p= <.001) and classroom management (r= .424, p= <.001).

HA1: There is a significant relationship between preschool teachers' self-efficacy in student engagement and their attitudes toward the use of technology in classrooms.

The findings from this study reveal a positive significant relationship between preschool teachers' sense of efficacy in student engagement and their attitudes toward the use of technology in classrooms in a medium effect size. These results align with previous studies that indicate that teachers who are confident in their ability to engage students are more likely to view new tools or technology that enhances learning experiences (Bakar et al., 2018; Kareem et al., 2022; Rasalingam et al., 2014). Teachers who possess high efficacy in student engagement often see technological tools as innovative methods for creating interactive and engaging learning environments (Gomez et al., 2021). These educators may recognize that technology provides new opportunities for motivating students and fostering a dynamic classroom atmosphere. By using technology, they believe they can introduce fresh ideas that stimulate curiosity and involvement, further aligning with their goal of maximizing student engagement (Kareem et al., 2022; Rasalingam et al., 2014). For instance, Rasalingam et al. (2014) and Rahmah and Aishah (2019) states that technological tools like Argumentation Reality (AR), digital games can serve as a mean to motivate students, creating an involving and engaging learning environment for all students.

Based on Bandura's Self-Efficacy Theory, teachers with high efficacy believe they are effective in engaging students (Tschannen-Moran & Hoy, 2001), and this confidence extends to their view of technology as a means to further stimulate interest and interaction in the classroom (Bakar et al., 2018). Teachers who have mastered traditional methods of student engagement may feel more comfortable experimenting with technology, believing it can

enhance their ability to capture students' attention and improve learning outcomes (Baroudi & Shaya, 2022). This sense of mastery, derived from past successes in engaging students, could motivate teachers to integrate technology as a way to amplify their teaching strategies. Furthermore, the Technology Acceptance Model (TAM) provides an additional framework for understanding this relationship. According to the TAM, perceived usefulness (PU) plays a critical role in teachers' attitudes toward technology (Alharbi & Drew, 2018). In this context, their high efficacy acts as a catalyst for their willingness to embrace technology, as they perceive it as an extension of their teaching abilities and an opportunity to foster more interactive and stimulating learning experiences (Kulviwat et al., 2023).

HA2: There is a significant relationship between preschool teachers' self-efficacy in instructional strategy and their attitudes toward the use of technology in classrooms.

The findings of this research indicate a significant relationship between preschool teachers' sense of efficacy in instructional strategies and their attitudes toward the use of technology in classrooms. This correlation suggests that teachers who feel confident in their teaching strategies are more likely to adopt and integrate technology into their classrooms. These results align with prior studies, such as Khanshan and Yousefi (2020), and Mayantao and Tantiado (2024), which have demonstrated that teachers with a strong sense of efficacy are more inclined to introduce innovative tools and technologies into their educational practices. Teachers with high self-efficacy are also more likely to perceive themselves as capable of incorporating new methods and tools into their teaching strategies (Mayantao & Tantiado, 2024). A sense of confidence in their instructional abilities translates into a greater level of comfort in using technology. As Johnson et al. (2016) found, when teachers feel confident in their overall teaching skills, they are more comfortable using technology to support and enhance those skills. This confidence allows teachers to view technology not as a challenge but as a tool that can enrich their classroom experience.

The findings are supported by Bandura's Self-Efficacy Theory, which posits that an individual's belief in their ability to succeed significantly influences their motivation to embrace innovation. As Lopez-Garrido (2023) explains, teachers with high instructional efficacy are motivated to take on new challenges, overcome obstacles, and apply innovative strategies in their classrooms. The availability of digital tools also plays a role in strengthening teachers' confidence, particularly through vicarious experiences. Baroudi and Shaya (2022) noted that observing other teachers successfully use technology in their classrooms can boost teachers' belief that they too can incorporate technology effectively. Furthermore, the Technology Acceptance Model (TAM) helps explain this relationship between instructional efficacy and attitudes toward technology use. Teachers with higher instructional efficacy are more likely to perceive technology as a useful tool (Perceived Usefulness, PU) that enhances their teaching (Alharbi & Drew, 2018). These teachers are also more likely to find the integration of technology into their instructional methods easier to accomplish (Perceived Ease of Use, PEOU), as they feel confident in their ability to master new tools and approaches (Alharbi & Drew, 2018). Therefore, teachers with high efficacy in instructional strategies are better equipped to embrace technology as an effective aid to their teaching, enhancing both their instructional methods and students' learning experiences (Marangunić & Granić, 2014).

H_A3: There is a significant relationship between preschool teachers' self-efficacy in classroom management and their attitudes toward the use of technology in classrooms.

The findings of this study reveal a significant relationship between preschool teachers' sense of efficacy in classroom management and their attitudes toward the use of technology in the classroom. This aligns with previous research, which has shown that teachers who have high efficacy in classroom management tend to view technology more favorably and agree that it improves their ability to manage classrooms (Coban & Atosy, 2019; Ghavifekr & Rosdy, 2015). Teachers with strong classroom management skills are likely to feel confident in their

capacity to maintain order and create a productive learning environment, even when introducing new tools like technology. This sense of competence appears to shape their attitudes, making them more open to integrating technology into their routines (Coban & Atosy, 2019). One explanation for this relationship is that teachers with high classroom management efficacy may not view technology as a disruptive force. Studies indicate that teachers who excel in managing classrooms are less likely to perceive technological tools as potential threats to their routines (Lazarides et al., 2020). Instead of seeing technology as something that could interfere with their established practices, these teachers tend to view it as an additional resource that supports their teaching objectives and improves classroom dynamics. Reyes and Del Valle (2023) suggest that these educators see technological tools as supportive resources that can enhance classroom management rather than challenge it.

The theoretical frameworks of Bandura's Self-Efficacy Theory and the Technology Acceptance Model (TAM) offer insight into these findings. Bandura's Self-Efficacy Theory posits that individuals' belief in their ability to succeed in specific situations influences their behavior and attitudes (Bandura, 1997). In the context of classroom management, teachers who believe in their ability to manage student behavior effectively are more likely to respond positively to changes in the learning environment, such as the incorporation of technology (Lopez-Garrido, 2023). Emiru and Gedifew (2024) found that these teachers feel capable of maintaining control, even when technology is introduced. Consequently, their strong sense of self-efficacy allows them to view potential classroom challenges associated with technology as manageable, leading them to see technology as an asset rather than a burden. Subsequently, the Technology Acceptance Model (TAM) also helps explain this relationship. According to TAM, perceived ease of use (PEOU) is a key factor in determining whether individuals adopt new technologies (Alharbi & Drew, 2018). If teachers perceive technology as a tool that enhances their classroom management, they are more likely to adopt it. Teachers with high

efficacy in classroom management are likely to view technology as easy to use and beneficial for their practice, further solidifying their positive attitudes toward its integration (Marangunić & Granić, 2014).

Implications

The implications of the findings strongly suggest that educators must take an active role in their own professional development, particularly when it comes to integrating technology into their teaching practices (Barton & Dexter, 2019). Based on the findings of the study, it is found out that half of the respondent teachers (38.3%) have not attended or involved themselves in any ICT related training before. Hence, these workshop or training learning opportunities provide educators with the technical skills needed to effectively implement digital tools in their classrooms (Willliams et al., 2016). Also, studies had mentioned that one's training knowledge should be renewed from time-to-time to follow up the rapid changing trends of society (Guerriero, 2017). Therefore, the continuous engagement in professional development that focused on technology integration can also significantly enhance educators' self-efficacy by building both competence and confidence Kiili et al. (2016). Through workshops and training sessions, educators gain hands-on experience with digital tools, allowing them to develop the technical skills necessary for effective classroom implementation. This direct engagement with technology not only increases their proficiency but also reduces the fear or hesitation that may come with using unfamiliar tools. As educators become more comfortable and adept at incorporating technology, their confidence grows, positively impacting their sense of self-efficacy. Feeling capable of navigating and applying digital tools in teaching allows educators to approach technology with a proactive and positive attitude, enabling them to use it more effectively to enhance student engagement and learning outcomes (An, 2018). Over time, this increased confidence leads to a greater willingness to experiment with new technologies, adapt

to changes, and integrate digital resources into their daily teaching practices (Banas and York, 2014).

Moreover, developing a growth mindset is critical in this context. A growth mindset involves recognizing that technology is not just an additional layer of complexity but a powerful tool that can transform teaching and learning. Educators who adopt this mindset view technology as a resource that can significantly boost student engagement and facilitate deeper learning experiences, rather than perceiving it as an obstacle or a burden (Porter et al., 2022). This positive outlook helps educators approach technological integration with enthusiasm and openness, which is crucial for exploring and implementing innovative teaching methods (Jacovidis et al., 2020). By embracing technology as an opportunity for innovation rather than a challenge, educators can foster a more dynamic and interactive classroom environment (Sahagun et al., 2021). This approach not only enhances their teaching practices but also creates a more engaging and stimulating learning experience for students. As educators become more adept at integrating technology and develop a positive attitude toward its potential, they are better positioned to leverage digital tools to meet diverse student needs and enrich the educational experience (Porter et al., 2022).

Moreover, the findings also provide insights for principals and educational leaders in facilitating the effective integration of technology into preschool settings. One key implication is the need for tailored professional development that specifically addresses the unique challenges faced by preschool teachers (Hennessy et al., 2022). Unlike older grades, early childhood education requires technology integration to be both developmentally appropriate and seamlessly incorporated into play-based learning environments. This means that training programs must be designed to address these specific challenges, such as selecting age-appropriate digital tools and integrating technology in a way that complements rather than disrupts developmental milestones (Williams et al., 2023). Effective professional development

should provide educators with not only an understanding of the latest technological advancements but also practical, actionable strategies for applying these tools in their daily teaching practices (Bowman et al., 2020). This approach ensures that educators can confidently use technology in ways that are beneficial and relevant to their students' needs.

In addition to professional development, educational leaders must also focus on investing in technological infrastructure. This investment goes beyond simply purchasing new devices; it involves creating a supportive environment that enables regular and effective use of technology. Providing access to technology is only part of the solution; ongoing support is crucial. This includes ensuring that teachers have opportunities to experiment with new tools and receive technical assistance as needed. Regular, hands-on use of technology helps educators build familiarity and confidence, allowing them to effectively integrate digital tools into their teaching (Johnson et al., 2016). By establishing a robust support system that includes both training and infrastructure, principals and leaders can help educators overcome technological barriers and harness the full potential of digital tools to enhance student learning experiences (Banas & York, 2014). This comprehensive approach fosters an environment where technology becomes an integral part of teaching and learning, ultimately contributing to a richer and more dynamic educational experience for young learners.

Limitations

However, despite the positive outcomes, there is few limitations for the current study, namely the reliance on self-reported data, limited generalizability and sampling method. First, one of the notable limitations in this study is its high reliance on self-reported measurement, which can eventually lead to bias and affect the accuracy of the findings. Self-reported data can introduce bias in many forms, including the most common social desirability bias (Pozas et al., 2022). In this study, this form of bias might have happened when the respondents overestimate their perceptions of self-efficacy or attitudes towards technology use to present

themselves as positive (Sharma & Nazir, 2021; Aesaert et al., 2017). Conversely, some of the respondents may underestimate their stregth or attitudes because they lack confidence or self-awareness (Aesaert et al., 2017), although it might now be true. This reliance on subjective self-assessments tends to lower the objectivity of the data, causing the accuracy for reflecting the respondents' actual competence or beliefs to decrease (Pozas et al., 2022). As a result, it can be difficult for the researcher to draw conclusions regarding teacher's self-efficacy and their attitudes toward the use of technology without accounting to bias results.

Furthermore, another important limitation found in this study is its limited generalizability. This issue happens due to the small size of its sample, which only includes a particular group of preschool teachers (60 respondents) from Selangor area (Borodovsky, 2022). Despite the findings had provided valuable insights into these teachers' beliefs and attitudes toward technology, it might still unbale to fully represent the variety of difficulties and practices faced by early childhood educators across Malaysia (Tyrer & Heyman, 2016). There are several factors such as the differences in socio-economies, the degree of accessible technological resources, regional educational policies, school infrastructure, and more can significantly influence how technology can be incorporated into early childhood education in different locations (Lee, 2021). Therefore, the study will result in a less representative findings to the broader population of early childhood educators.

Besides that, the use of convenience sampling as the sampling method of this study is also another limitation, which will also impact the generalizability of the findings (Murchland et al., 2019). This sampling method involves selecting participants based on their availability or the ease to recruit, rather than using a more randomized or stratified approach for a broader representation (Andrade, 2020). Although this method is convenient and practical, especially when there is limited time, it will create a sample that is not fully representative of the broader population (Murchland et al., 2019). As participants are chosen by the researcher based on

accessibility rather than by chance, the sample can over-represent certain traits while also under-presenting others, such as demographic characteristics, attitudes, or teaching experiences (Andrade, 2020). This lack of consideration in variety can caused a biased result, which again making it challenging to generalize the findings to larger population studied (Rupe et al., 2022).

Recommendations

To address the limitations of this study, there are few recommendations that can further optimise related research fields, which include utilizing a different research method, collecting a larger and diverse sample, and employ a random sampling method. The first recommendation to be made is to consider employing a different research design in future study. As mentioned, self-reported data can provide valuable insights, but it is often subject to biases (Pozas et al., 2022). Thus, to further improve the reliability and depth of the findings, future research could integrate an observational research designs or interviews to validate the self-reported data (Yong et al., 2021). By using observations in a real classroom setting, it would provide a more real and detailed understanding on how teachers shape their attitudes towards integrating technology and respond to the various challenges (Faez & Karas, 2017). Similar to this, interviewing teachers can provide researcher with a deeper understanding of their attitudes and to collect details that could be overlooked in surveys (Kosiol & Ufer, 2024). In short, using these qualitative approaches with self-reports, future research could present a more thorough understanding of the ways in which early childhood educators use technology in classrooms (Faez & Karas, 2017).

Moving on, aim for larger and more diverse samples is another recommendation to improve the limitations of limited generalizability. This can particularly include teachers from various types of schools, such as public and private institutions. This approach can further enhance the generalizability of the findings, allowing for a more accurate, and broader understanding of how different organization climate can influence its teacher’s self-beliefs,

their attitudes towards technology integration, and its actual application in early childhood education (Beeler, 2018). In other words, a more diverse sample can look through the experiences and challenges faced by teachers from different educational settings, providing a more comprehensive view of the factors affecting technology use in classrooms (Adams et al., 2018). In addition to reducing biases and guaranteeing that the study's results are applicable to a larger audience, increasing the sample size and diversity would also increase the research's validity and relevance.

Moreover, future researchers can consider the use of random sampling in research to address the limitations of convenience sampling employed in current study. A random sampling method ensures that each and every individual in the population has access to an equal chance to being selected, which is important the representativeness of the sample (Setia, 2016). By include a range of demographics, experiences, and backgrounds, this sampling method can help convey the variety of the overall population and reduce the potential of selection bias. (Edwards & Edwards, 2024). The findings would be significantly more relevant and broadly generalisable if the sample was representative of the larger population (Andrade, 2020). Not to mention that an increased understanding of the study issue would result from this greater variety, providing grater possibilities to more sophisticated concepts and conclusions (Alvi & Moshi, 2016). Therefore, recommending the employment of random sampling would greatly improve the study's validity and reliability as it increases its applicability to a variety of educational settings.

Conclusion

To conclude, this study examines the relationship between preschool teacher's self-efficacy in student engagement, instructional strategy, classroom management and their attitudes toward the use of technology in classrooms, among Selangor area. The current study seeks to fill a gap in local literature, which has largely focused on teacher's self-efficacy and attitudes toward technology use with other context, while also overlooking the local context and different educational levels such as primary, secondary, and higher education. Without addressing this gap, there may be sufficient understanding of how local early childhood educational contexts and varying factors influence teachers' attitudes, potentially leading to limited strategies for incorporating technology effectively in classrooms. Bandura's Self-Efficacy Theory and Technology Acceptance Model (TAM) is utilized to deeper understand and investigate the relationship between teacher's self-efficacy and their attitudes toward technology. Furthermore, this quantitative correlational research had used Teacher's Self-Efficacy Scale (TSES), developed by Tschannen-Moran & Hoy (2001); and Scale of Attitudes towards Using Technological Tools in Preschool Education, introduced by Kol (2012) to collect data from respondents to examine the two variables. As a result, the findings demonstrated that preschool teacher's self-efficacy in all three subscales, which includes student engagement, instructional strategy and classroom management were positively correlated with their attitudes toward the use of technology, in a moderate medium effect. The findings have some crucial implications toward the field of early childhood education, particularly for educators, and principals and educators' leaders. By understanding how one's self-efficacy can influence their positive attitudes, and the importance of continuously updating one's knowledge and skills, educators and educational leaders can be prompt to take initiative to enhance their self-efficacy and digital confidence and competence. However, the current study has several limitations that should be noted. Firstly, there is a significant reliance on self-reported data, which can

introduce biases and affect the accuracy of the findings. Additionally, the limited generalizability of the results is a concern, as the sample size is worrisomely small, and the convenience sampling method used may not accurately represent the broader population. To address these issues in future research, it is recommended to incorporate research design such as observational studies and interviews as these methods can provide richer data. Furthermore, collecting larger sample sizes and employing a random sampling approach would enhance the representativeness of the findings and strengthen the overall validity of the research.

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Appendix

Appendix A: Questionnaires

Informed Consent Letter

You are invited to participate in a study conducted by the researcher, titled as above. You are required to answer a series of questions, which covers.

1. Demographic Questions
2. Teacher's Sense of Efficacy Scale
3. Scale of Attitudes Towards the Use of Technological Tools in Preschool Education.

Purpose: The purpose of this study is to further establish the relationship between preschool teacher's sense of efficacy in 3 dimensions of student engagement, instructional strategy, and classroom management and their attitudes towards using technological tools in classroom among Malaysian preschool teachers.

Procedure: This is a self-reported questionnaire. It will take 30 minutes of your time. Your participation in this study is voluntary and you have the right to not answer any of the questions that you do not like answering.

Potential risks and benefits: There are no anticipated risks associated with participating in these studies beyond those encountered in daily life.

Confidentiality: All the information you have given will be kept private and confidential. Your information will be stored only by code, with personal details kept secured in files and computer with access only by the immediate research team. The results of this study will be presented at conferences and written up in journals. In this event of publication, no personal identification will be disclosed.

Informed consent: I have read and understood all the information stated above. I have my questions answered satisfactorily. I, hereby consent to voluntarily participate in this research.

- Yes, I agree
- No, I disagree

Demographic Questions

Gender

- ◯ Male
- ◯ Female

Age

- ◯ 20 or below
- ◯ 21-30
- ◯ 31-40
- ◯ 41-50
- ◯ 51 or above

Educational Level

- ◯ SPM / STPM / UEC
- ◯ Diploma
- ◯ Undergraduate degree
- ◯ Postgraduate Degree
- ◯ Other: _____

Teaching experiences

- ◯ 1-5 years
- ◯ 6-10 years
- ◯ 11-20 years
- ◯ Over 20 years

Availability of Digital Tools (DT) used in the ECE classroom

- [ ] Computer
- [ ] TV
- [ ] Internet Access
- [ ] DVD
- [ ] Projector
- [ ] Smartphone
- [ ] Digital Camera
- [ ] Tablet PC

Have you ever attend to any ICT training before *

- ◯ Yes
- ◯ No

Teacher Sense of self-efficacy scale

How much can you do to control disruptive behavior in the classroom? *

	1	2	3	4	5	6	7	8	9	
Nothing	◯	◯	◯	◯	◯	◯	◯	◯	◯	A Great Deal

How much can you do to motivate students who show low interest in school work? *

	1	2	3	4	5	6	7	8	9	
Nothing	◯	◯	◯	◯	◯	◯	◯	◯	◯	A Great Deal

How much can you do to get students to believe they can do well in school work? *

	1	2	3	4	5	6	7	8	9	
Nothing	◯	◯	◯	◯	◯	◯	◯	◯	◯	A Great Deal

How much can you do to help your students value learning? *

	1	2	3	4	5	6	7	8	9	
Nothing	○	○	○	○	○	○	○	○	○	A Great Deal

To what extent can you craft good questions for your students? *

	1	2	3	4	5	6	7	8	9	
Nothing	○	○	○	○	○	○	○	○	○	A Great Deal

How much can you do to get children to follow classroom rules? *

	1	2	3	4	5	6	7	8	9	
Nothing	○	○	○	○	○	○	○	○	○	A Great Deal

How much can you do to calm a student who is disruptive or noisy? *

	1	2	3	4	5	6	7	8	9	
Nothing	○	○	○	○	○	○	○	○	○	A Great Deal

How well can you establish a classroom management system with each group of students? *

	1	2	3	4	5	6	7	8	9	
Nothing	○	○	○	○	○	○	○	○	○	A Great Deal

How much can you use a variety of assessment strategies? *

	1	2	3	4	5	6	7	8	9	
Nothing	○	○	○	○	○	○	○	○	○	A Great Deal

To what extent can you provide an alternative explanation or example when students are confused? *

	1	2	3	4	5	6	7	8	9	
Nothing	○	○	○	○	○	○	○	○	○	A Great Deal

How much can you assist families in helping their children do well in school? *

	1	2	3	4	5	6	7	8	9	
Nothing	○	○	○	○	○	○	○	○	○	A Great Deal

How well can you implement alternative strategies in your classroom? *

	1	2	3	4	5	6	7	8	9	
Nothing	○	○	○	○	○	○	○	○	○	A Great Deal

Scale of attitudes towards the use of technology tools in preschool education

Technological tools are indispensable tools for me. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The use of technological tools contribute to preschool education. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Using technological tools and materials in the activities is a waste of time. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools facilitate the work of preschool teachers considerably. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools make the quality of preschool education improved. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools reduce the role of the teacher in the classroom. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools highly motivate preschool children. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools make preschool activities more enjoyable. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools break preschool child's concentration. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

My technical knowledge is adequate to use technological tools. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

It is unnecessary to use technological tools in preschool education. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools are suitable for teaching methods used in preschool. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

In order to provide a quality education, experienced teachers do not need the technological tools. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

In terms of visuality, it is important to use technological tools in the preschool activities. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools make the preschool teachers more effective in education. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools reduce the teacher-student interaction. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools make the information more permanent. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The level of development of preschool children are increased by the help of the activities carried out with the technological tools. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools contribute to the development of the child positively. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Technological tools are highly effective on materializing abstract concepts in the activity process. *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Back Submit Clear form

Appendix 2: Original data

Table A1

SPSS output of descriptive statistics - Respondents Gender

Gender

	N	%
Female	56	93.3%
Male	4	6.7%

Table A2

SPSS output of descriptive statistics - Respondents Age

Age

	N	%
20 or below	2	3.3%
21-30	29	48.3%
31-40	22	36.7%
41-50	6	10.0%
51 or above	1	1.7%

Table A3

SPSS output of descriptive statistics - Respondents Educational Level

Educational Level

	N	%
Diploma	13	21.7%
Postgraduate Degree	4	6.7%
SPM / STPM / UEC	8	13.3%
Undergraduate degree	35	58.3%

Table A4

SPSS output of descriptive statistics - Respondents Teaching Experiences

Teaching experiences

	N	%
1-5 years	30	50.0%
11-20 years	7	11.7%
6-10 years	21	35.0%
Over 20 years	2	3.3%

Table A5

SPSS output of descriptive statistics - Respondents Opinions on the Availability of Digital Tools used in ECE

Availability of Digital Tools (DT) used in the ECE classroom

	N	%
Computer	1	1.7%
Computer, Digital Camera	1	1.7%
Computer, DVD, Smartphone, TV, Tablet PC	1	1.7%
Computer, Internet Access, DVD, Projector	1	1.7%
Computer, Internet Access, Projector	1	1.7%
Computer, Internet Access, Projector, Smartphone, Tablet PC	2	3.3%
Computer, Internet Access, Projector, Tablet PC, Smartphone, DVD	1	1.7%
Computer, Internet Access, Smartphone	1	1.7%
Computer, Projector	1	1.7%

Computer, Projector, Internet Access, TV, Digital Camera, Smartphone	1	1.7%
Computer, Projector, Smartphone	1	1.7%
Computer, Projector, Smartphone, Digital Camera	1	1.7%
Computer, Smartphone, Tablet PC	1	1.7%
Computer, Tablet PC, TV	1	1.7%
Computer, TV, Digital Camera, Tablet PC	1	1.7%
Computer, TV, Internet Access	1	1.7%
Computer, TV, Internet Access, DVD, Projector, Smartphone	1	1.7%
Computer, TV, Internet Access, DVD, Smartphone	1	1.7%
Computer, TV, Internet Access, Projector, Smartphone, Digital Camera	1	1.7%
Computer, TV, Internet Access, Projector, Smartphone, Digital Camera, Tablet PC	3	5.0%
Computer, TV, Internet Access, Projector, Smartphone, Tablet PC	2	3.3%
Computer, TV, Internet Access, Projector, Tablet PC	2	3.3%
Computer, TV, Internet Access, Smartphone, Digital Camera, Tablet PC	1	1.7%
Computer, TV, Internet Access, Smartphone, Tablet PC	1	1.7%
Computer, TV, Tablet PC	1	1.7%
Digital Camera	1	1.7%
Digital Camera, Computer, Projector, TV, Tablet PC, DVD, Smartphone, Internet Access	1	1.7%
Digital Camera, DVD, Tablet PC, Projector, TV, Internet Access, Smartphone	1	1.7%

Digital Camera, Internet Access, Projector, Computer, Tablet PC, DVD, Smartphone, TV	1	1.7%
Digital Camera, Smartphone	1	1.7%
Digital Camera, Tablet PC, Projector, TV, Internet Access, DVD	1	1.7%
DVD, Internet Access, TV, Digital Camera, Smartphone, Projector, Computer, Tablet PC	1	1.7%
DVD, TV	1	1.7%
Internet Access	2	3.3%
Internet Access, DVD	1	1.7%
Internet Access, DVD, Smartphone	1	1.7%
Internet Access, Projector, Smartphone	1	1.7%
Internet Access, Tablet PC, Projector, TV, Digital Camera, Smartphone, Computer	1	1.7%
Projector, Computer, TV	1	1.7%
Projector, Internet Access, Digital Camera, TV, DVD, Computer, Smartphone, Tablet PC	1	1.7%
Projector, Internet Access, Smartphone, Computer, TV	1	1.7%
Projector, Smartphone, Computer, Internet Access, Tablet PC, Digital Camera	1	1.7%
Projector, Tablet PC, Internet Access, DVD, TV, Smartphone, Digital Camera, Computer	1	1.7%
Smartphone	1	1.7%
Smartphone, Digital Camera, Projector, Computer, DVD, TV	1	1.7%
Smartphone, Tablet PC	2	3.3%
Smartphone, Tablet PC, Computer, TV, Projector, DVD	1	1.7%

Smartphone, TV, Digital Camera, Internet Access, Projector, Computer, Tablet PC	1	1.7%
Tablet PC, DVD, Internet Access, Computer, Smartphone, TV, Projector	1	1.7%
Tablet PC, Projector, TV	1	1.7%
TV	1	1.7%
TV, Computer	1	1.7%
TV, Internet Access, Smartphone	1	1.7%

Table A6

SPSS output of descriptive statistics - Respondents Self-evaluation for the attendance of ICT training

Have you ever attended to any ICT training before

	N	%
No	23	38.3%
Yes	37	61.7%

Appendix C: Result

Table A7

SPSS output - Mean and Standard Deviation of Total Teachers' Sense of Efficacy Scale (TSES) and its Subscales

Statistics

		TotalE	TotalSE	TotalIS	TotalCM
N	Valid	60	60	60	60
	Missing	0	0	0	0
Mean		7.1583	7.1958	7.1375	7.1417
Std. Deviation		1.03433	1.01794	1.17118	1.16022

Table A8

SPSS output – Grouping the points of Teachers' Attitudes towards the use of Technological Tools in Preschool Education.

TotalA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.75	1	1.7	1.7	1.7
	3.00	1	1.7	1.7	3.3
	3.05	1	1.7	1.7	5.0
	3.10	2	3.3	3.3	8.3
	3.20	2	3.3	3.3	11.7
	3.25	2	3.3	3.3	15.0
	3.30	1	1.7	1.7	16.7
	3.35	1	1.7	1.7	18.3
	3.40	3	5.0	5.0	23.3
	3.50	1	1.7	1.7	25.0

	3.55	1	1.7	1.7	26.7
	3.60	2	3.3	3.3	30.0
	3.65	1	1.7	1.7	31.7
	3.70	2	3.3	3.3	35.0
	3.80	6	10.0	10.0	45.0
	3.85	1	1.7	1.7	46.7
	3.90	1	1.7	1.7	48.3
	3.95	1	1.7	1.7	50.0
	4.00	5	8.3	8.3	58.3
	4.05	2	3.3	3.3	61.7
	4.15	1	1.7	1.7	63.3
	4.20	1	1.7	1.7	65.0
	4.25	1	1.7	1.7	66.7
	4.30	5	8.3	8.3	75.0
	4.35	2	3.3	3.3	78.3
	4.40	2	3.3	3.3	81.7
	4.45	1	1.7	1.7	83.3
	4.50	2	3.3	3.3	86.7
	4.55	2	3.3	3.3	90.0
	4.60	1	1.7	1.7	91.7
	4.65	2	3.3	3.3	95.0
	4.70	1	1.7	1.7	96.7
	4.75	1	1.7	1.7	98.3
	4.95	1	1.7	1.7	100.0
	Total	60	100.0	100.0	

Table A9

SPSS output – Pearson correlation between teachers' self-efficacy in student engagement and their attitudes toward the use of technology in classrooms

Correlations

		TotalSE	TotalA
TotalSE	Pearson Correlation	1	.389**
	Sig. (2-tailed)		.002
	N	60	60
TotalA	Pearson Correlation	.389**	1
	Sig. (2-tailed)	.002	
	N	60	60

**. Correlation is significant at the 0.01 level (2-tailed).

Table A10

SPSS output – Pearson correlation between teachers' self-efficacy in instructional strategy and their attitudes toward the use of technology in classrooms

Correlations

		TotalA	TotalIS
TotalA	Pearson Correlation	1	.445**
	Sig. (2-tailed)		<.001
	N	60	60
TotalIS	Pearson Correlation	.445**	1
	Sig. (2-tailed)	<.001	
	N	60	60

**. Correlation is significant at the 0.01 level (2-tailed).

Table A11

SPSS output – Pearson correlation between teachers' self-efficacy in classroom management and their attitudes toward the use of technology in classrooms

Correlations

		TotalA	TotalCM
TotalA	Pearson Correlation	1	.424**
	Sig. (2-tailed)		<.001
	N	60	60
TotalCM	Pearson Correlation	.424**	1
	Sig. (2-tailed)	<.001	
	N	60	60

**. Correlation is significant at the 0.01 level (2-tailed).