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Teachers' ICT Competence, Techno-Efficacy, School Support, and Attitude Towards Digital Use in Teaching: A Mediation and Moderation Study

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In the modern era of education, there is a greater emphasis on technology, and teachers are required to have a high level of digital proficiency. This study investigated the mediating and moderating role of techno-efficacy and school support in the relationship between teachers' ICT competence and attitude towards digital use in teaching among secondary schools in Cagayan, Philippines. It employed a correlational research design. The respondents were 118 teachers, and the results were calculated using the Lynch formula. The study found that teachers' techno-efficacy mediates the positive relationship between ICT competence and attitude towards digital use in teaching. In addition, school support moderates the strength of the relationship between ICT competence and attitude towards digital use in teaching. This implies that techno-efficacy intervenes in the relationship between ICT competence and attitude towards digital use in teaching and that school support influences the strength of this relationship. These findings highlight the importance of providing adequate ICT tools, robust infrastructure, continuous professional development, collaborative opportunities, innovative teaching methods, supportive leadership, and regular evaluation of training programs.

Introduction

In the 21st century, teachers are expected to possess strong digital skills, often referred to as being tech-savvy, as technology plays a central role in modern education. This reflects their ability to effectively use ICT tools and processes as resources for teaching and learning. Integrating ICT in the classroom enhances access to quality education, fosters inclusivity, empowers learners and supports sustainable development.

When schools started utilizing the Internet, computers, and other telecommunications tools in the early 1990s, the term "information and communication technology" (ICT) gained popularity. Information and communication technology is referred to as "ICT." The ability to use digital technology, communications tools, and networks to acquire, integrate, manage, analyze, and report information was described by the ICT Literacy Panel in 2002 (Ogunjimi et al., 2022). Johnston (2021) claimed that digital literacy promotes the development of

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modern academic competencies, including information, media, and technology.

Based on previous studies, teachers should be aware of the benefits of ICT, remain up to date on technological issues, prepare themselves to teach tech-savvy students, and, most importantly, incorporate technology into the classroom to improve students' academic performance (Bond et al., 2018; Hashim, 2018; Tursunalievich & Rahmat, 2021). Teachers should embrace an era in which multimedia technological expansion and digital literacy are prevalent.

Furthermore, it has been demonstrated that digital technology in education can benefit from various information, communication, and technological tools. The application of information and communications technology has been elevated to the status of a worldwide education strategy, which has a considerable impact on the transformation of educational systems in various nations at the forefront of technological innovation (Amhag et al., 2019).

The integration of ICT into the classroom supports multiple Sustainable Development Goals (SDGs). It improves education quality (SDG 4) by providing access to information and personalized learning experiences. In addition, ICT integration reduces inequalities by assuring equal access to educational resources and opportunities (SDG 10). It also contributes to sustainable conditions and communities (SDG 11) by facilitating innovative education systems and reducing physical infrastructure requirements. Moreover, ICT integration promotes responsible consumption and production (SDG 12) by utilizing digital resources and open educational materials. Lastly, ICT integration facilitates partnerships (SDG 17) by connecting teachers and learners globally, fostering collaboration and knowledge sharing. Thus, schools can make significant progress toward attaining these SDGs and creating a more equitable and sustainable future by incorporating ICT into education (Ferrer-Estévez & Chalmeta, 2021).

Incorporating information and communications technology (ICT) in the classroom is a relatively new method that encourages students to engage in learning activities that are more productive and relevant to today's world. By providing students with current information, real-world examples, and interactive instruments for application, ICT may make learning more engaging and applicable. ICT may also teach learners vital skills for success in the contemporary environment, such as critical thinking, problem-solving, and collaboration. Many schools and students adopt this method to improve digital literacy (Otterborn et al., 2018; Zhao et al., 2021).

Also, proficiency in information and communication technologies (ICT) has been recognized as one of the most critical aspects of teaching skills. Consequently, according to Treceñe (2021), it has been incorporated as one of the learning goals and objectives in the Philippines' educational curriculum. It was also cited that most of the day-to-day responsibilities assigned to teachers are completed with the assistance of various technical platforms, including but not limited to computers, laboratories, the Internet, and teaching. Despite this, there are still issues with inexperience, integration, and access to information and communication technologies.

ICT implementation in education in the Philippines has several challenges and concerns. First, the availability of ICT resources is a crucial concern. Schools do not have enough ICT resources to accommodate the number of students enrolled. Many educational institutions, specifically small schools, cannot cover the costs of their purchase, maintenance, and other expenses. With this, there is a failure to integrate technology into the teaching and learning

process effectively, and a lack of expertise follows (Parinasan et al., 2024). Another problem facing the educational society in the 21st century is a lack of proficiency in using ICT. Also, insufficient funding for ICT devices poses a challenge in developing nations, as effective technology integration requires accessible devices, software, and infrastructure, while high costs and maintenance issues further hinder educational progress.

Furthermore, it was also cited by Parinasan et al., (2024) that teachers are the most important predictors of how innovative technologies are utilized in the classroom. ICT is just one of the concerns in the teaching and learning process. Thus, many teachers are overloaded, which leads to a lack of time to develop and use technology in the classroom. The teacher needs adequate school support, proper training, and ample time to work with other teachers and learn to use the equipment and software. Similarly, another significant problem with using information and communication technology is the means of change. Through the advent of technology, some teachers are not able to cope with the trends in ICT integration. These issues and challenges sometimes relate to teacher's techno-efficacy, competence, and skill in using ICT in the educational setting.

Despite these issues and challenges in ICT integration, DepEd has developed several programs to address these problems. The department implemented both the DepEd Computerization Program and the Digital Rise Program. To improve teaching and learning and prepare students for the challenges of the 21st century, these projects provide public schools in the Philippines with the appropriate technology. The programs aimed to improve students' ICT literacy and provide K–12 curriculum-aligned ICT packages to public schools (DepED, 2023).

Besides, prior studies on teachers' attitudes toward integrating technology in teaching have found that most teachers believe that technology is essential and valuable for teaching various subjects; however, the practices teachers employ in the classroom contradict this conviction (Lai et al., 2022; Antonietti et al. 2022). Even though most educators have a positive outlook on the growth of information and communication technology for teaching and learning, they do not possess the ICT pedagogy that is required to successfully deploy it in their classrooms due to poor school pedagogical support (Roussinos & Jimoyiannis, 2019; Ali, 2020; Rana & Rana, 2020; Bolaji & Adeoye, 2022).

In addition, other researchers found that the school support improved both the teachers' technological skills and their understanding of ICT's role in enhancing the quality of education. Most research concurs that training is necessary to boost teachers' knowledge and proficiency with classroom information and communication technology (Hafifah & Sulistyo, 2020; Beardsley et al., 2021; Sprenger & Schwaninger, 2021). Nevertheless, prior studies have established that a teacher's level of techno-efficacy substantially impacts the consistency with which they use various forms of technology and their level of success when doing so (Mitchell, 2021). It is feasible to anticipate that attitude towards digital use in teaching is related to their confidence in their ability to work effectively with these tools. Because of this, techno-efficacy is a helpful predictor of how effectively teachers are prepared to use instructional technology.

In addition to teachers' technical experience and skill, various other factors impact how effectively they can integrate technology into lesson plans. A good attitude toward technology, training, access to the Internet at home, and enough time to integrate the curriculum all play a part in incorporating technology inside the classroom (Barton & Dexter,

2019; Schmid et al., 2021). The longer they use technology, the more literate they become. Thus, there is a correlation between teachers' time utilizing computers in the classroom and their technological confidence in teaching (Mahdum et al., 2019).

For educators to integrate technology successfully into their pedagogical methods, they must be self-reliant in its application. On the other side, it has been demonstrated that low techno-efficacy among teachers is associated with ineffective use of technology in the classroom. Although enhanced techno-efficacy does not immediately convert into actual technology use by teachers, a more positive attitude toward digital use in education is essential (Rohwer et al., 2022).

In light of this, the study investigated the mediating and moderating role of techno-efficacy and school support on the relationship between teachers' ICT competence and attitude towards digital use in teaching. Techno-efficacy and school support are crucial in enhancing a teacher's ICT competence and digital use in the classroom. The study highlights the critical role of teachers' techno-efficacy and the availability of institutional support in fostering their ability and willingness to effectively incorporate ICT in the classroom, ultimately enhancing teaching practices and student outcomes.

Research Model and Hypotheses

Based on the scrutinized prior studies, the following hypotheses were formulated:

(1) ICT competence is related to the techno-efficacy of secondary school teachers.
(2) Techno-efficacy is related to the attitude towards digital use in teaching of secondary school teachers.
(3) Techno-efficacy mediates the relationship between ICT competence and attitude towards digital use in teaching of secondary school teachers.
(4) School support moderates the relationship between ICT competence and attitude towards digital use in teaching of secondary school teachers.

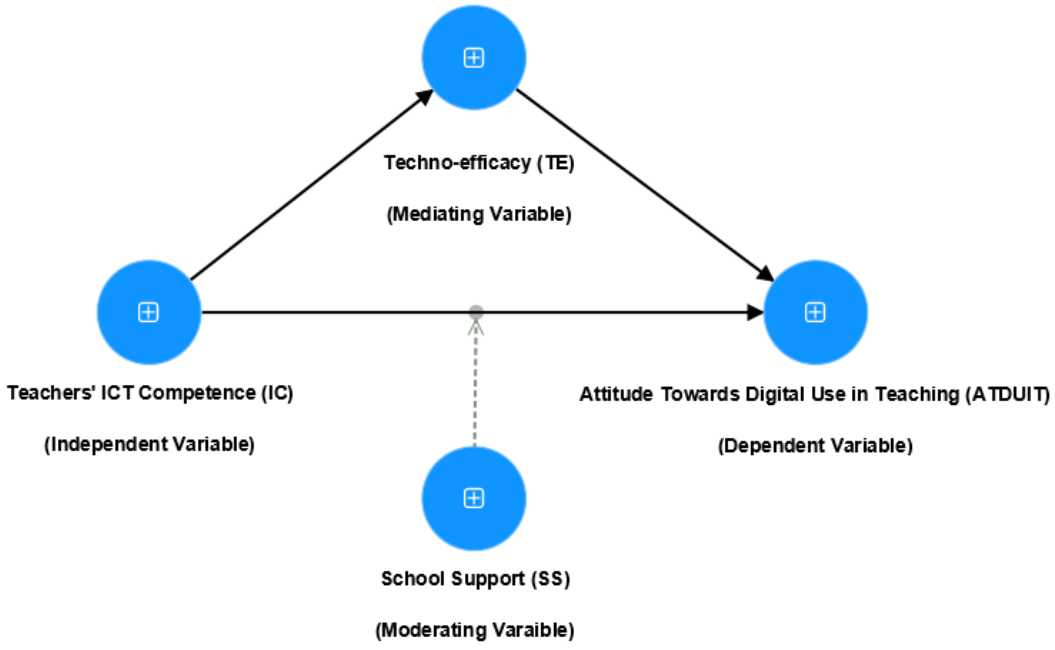

Figure 1. The Proposed Mediation and Moderating Models

Prior studies have established a significant relationship between teachers' ICT competence and their attitudes toward digital use in teaching. While this direct relationship is well-documented in the literature, the current study suggests that this connection could be indirect, offering an opportunity to investigate additional factors that influence it. Specifically, the study proposes that techno-efficacy mediates the relationship, suggesting that as teachers enhance their ICT competence, their efficiency in using technology improves, thereby fostering a more positive attitude toward digital integration in teaching. Furthermore, the study highlights school support as a moderating variable, emphasizing that even ICT-competent teachers require adequate pedagogical and technical support to effectively incorporate technology into the teaching and learning process. Thus, the research framework positions ICT competence as the independent variable, and attitude toward digital use in teaching as the dependent variable, with techno-efficacy and school support serving as mediating and moderating variables, respectively.

Method

This study employed a correlational research design. This research design integrates modern quantitative techniques in a specific sequence to thoroughly comprehend the role of techno-efficacy and school support on the relationship between teachers' ICT competence and attitude towards digital use in teaching among public secondary school teachers.

On the other hand, the mediation approach was used to investigate the mediating effect of techno-efficacy on the relationship between ICT competence and attitude towards digital use in teaching. A mediator explained the independent-dependent relationship (MacKinnon & Valente, 2019). Consequently, this study utilized Preacher and Hayes's most recent mediation approach.

The moderation approach was also used to examine the moderating effect of school support on the relationship, as mentioned above. Moderation tests if a third variable affects the strength or direction of an independent-dependent relationship. Mediation and moderation established how these third variables related to the problem (Kock, 2021).

Participants

The study's respondents were teachers from three public secondary schools employed in the Division of Cagayan, Philippines. The total number of the population was 169. To avoid biases in the analysis and equal chances to form part of the study, they were all selected through proportionate stratified random sampling. According to Iliyasu and Etikan (2021), this sampling technique is choosing a unit from a stratum correlated with the relative size of that stratum in the population. Hence, the size of the sample strata is proportionate to the size of the population.

Lynch's formula was applied to 118 respondents to obtain the following table, which shows the respondents' distribution according to school assignments.

Table 1. Distribution of the Respondents

School	Population	Sample
School A	105	73
School B	44	31
School C	20	14
Total	**169**	**118**

Research Instrument

The study's primary data collection instrument was a four-part survey questionnaire. The first section of the questionnaire determines the participant's demographic profile regarding the position, educational attainment, school assignment, specialization, designation, years in teaching, ICT devices, digital tools, and video conferencing platforms already used in teaching, and the number of ICT-related seminars and training attended.

The second section of the questionnaire was also used to investigate the techno-efficacy of the teachers. An adapted questionnaire was developed and localized based on the findings of Laver et al. (2011). In their investigation, the modified computer self-efficacy scale had a standardized alpha coefficient of 0.94, indicating a high internal consistency. The construct consists of ten five-point Likert scale statements.

Meanwhile, the third section of the questionnaire investigated the teachers' level of school support towards digital use in teaching. The scale was adapted from the study of Dong et al. (2019) with an alpha coefficient of 0.95, indicating a high internal consistency. The construct comprises ten statements on a five-point Likert scale.

Furthermore, the fourth section of the questionnaire scrutinized teachers' attitudes towards digital use in teaching. The scale was adopted based on the research conducted by Semerci and Aydın (2018), with an alpha coefficient of 0.74. On a five-point Likert scale, the construct comprises 11 statements.

Ensuring the validity and reliability of the research instrument was crucial for developing the research model. To achieve this, face and content validity were employed, with the instrument being evaluated by experts. According to Binti Daud (2021), face and content validity provides a straightforward and effective method for assessing the overall validity of a test or instrument through expert review.

After that, the research instrument underwent pilot testing and a Cronbach's alpha test for reliability. Cronbach's alpha was a measure of internal consistency, or how closely a set of statements relates to one another as a group. It was considered a measure of the trustworthiness of scales. A Cronbach's alpha of 0.70 or higher was considered acceptable, 0.80 or higher is preferable, and 0.90 or higher is ideal (Taber, 2017; Kock, 2021).

The calculated Cronbach's alpha coefficients below confirmed that the research instrument used for techno-efficacy, school support, and attitude towards digital use in teaching was fit for the study participants and reliable for hypotheses testing.

Table 2. Scale Reliability Test Results

Variables	Cronbach's Alpha	Interpretation
Techno-efficacy	0.961	Reliable
School Support	0.958	Reliable
Attitude Towards Digital Use in Teaching	0.908	Reliable

Separately, teacher-made performance criteria were used to assess the ICT competence of teachers with a total of 20 performance indicators. The instrument was constructed based on the National ICT Competency Standards for Teachers (NICS) issued by the Commission of Information and Communication Technology Philippines. NICS measures teachers' literacy and ICT competencies using six indicators: ICT fundamentals, word processing, spreadsheets, presentation, information and communication, and computer ethics and security.

Data Analysis

The data were analyzed using mediation and moderation analysis to examine the roles of techno-efficacy and school support in the relationship between teachers' ICT competence and their attitudes toward digital use in teaching. The analysis was conducted at a 0.05 level of significance, ensuring statistical consistency and reliability. The statistical software Jamovi 2.2.1 was utilized for this purpose, offering advanced analytical tools for exploring complex interactions and indirect effects. Mediation analysis was employed to determine whether techno-efficacy explains the link between ICT competence and attitudes toward digital use, while moderation analysis assessed whether school support influences the strength of this relationship. This combined analytical approach provided a detailed understanding of the factors affecting ICT integration among teachers, contributing to a deeper insight into how personal efficacy and institutional support shape digital teaching practices.

Results

Mediation and Moderating Model Results

Figure 3 illustrates the results of the mediation and moderation model. The mediation effect indicates that Path A and B are positively significant, whereas Path C is also positive and significant. On the other hand, the moderating effect of school support on the relationship between teachers' ICT competence and attitude towards digital use in teaching is significant. The components and interactions of the mediation and moderation models are shown in the tables below for a more detailed discussion.

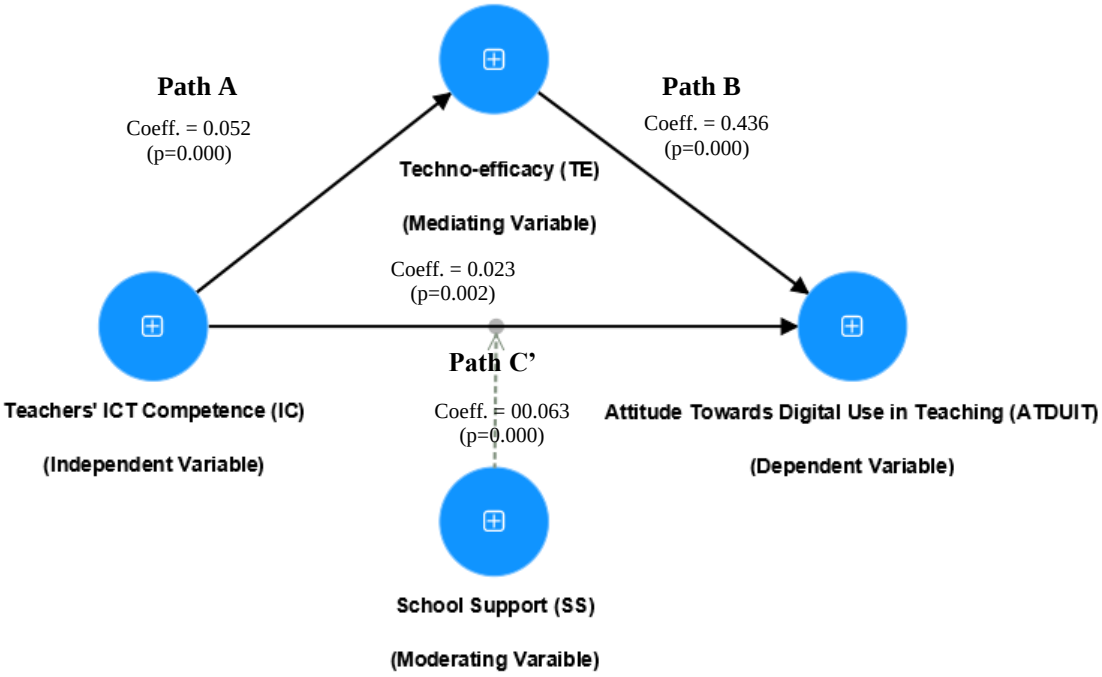

Figure 3. Effects of the Mediation and Moderating Models

Mediation Results

Mediation analysis was employed to examine the mediating effect of techno-efficacy on the relationship between ICT competence and attitude towards digital use in teaching. Table 3 indicates that path A, the relationship between teachers' ICT competence and techno-efficacy, is positively significant (β=0.052, p=0.000), while path B, the relationship between techno-efficacy and attitude towards digital use in teaching, is also significant and positive (β=0.436, p=0.000). Moreover, path A*B, the indirect effect of the relationship between ICT competence and attitude towards digital use in teaching through techno-efficacy as the mediator, is significant (β=0.023, p=0.002).

Preacher and Hayes (2008) asserted that three requirements must be satisfied to claim a mediation effect. Firstly, path A must be significant for the mediator (M) and independent variables (X) to be significantly correlated. Secondly, in path B, the mediator (M) must also significantly influence the dependent variable (Y). Thirdly, in path C', the indirect effect measured by the product of the coefficients linking X and M and M and Y must be significant. Therefore, after confirming all of Preacher and Hayes' (2008) requirements, it could be concluded that techno-efficacy mediates the relationship between teachers' ICT competency and attitude toward using technology in the classroom.

Nevertheless, the results of path C', the direct effect of the relationship between teachers' ICT competence and attitude towards digital use in teaching, is also significant (β=0.069, p=0.000). Preacher and Hayes (2008) established a framework for analyzing the mediating effects of a variable in a causal relationship involving an independent variable (IV) and a dependent variable (DV). This framework distinguishes between partial and full mediation. Partial mediation occurs when the IV influences the DV both directly and indirectly. In other words, even though the mediator, the third variable, explains the relationship between the IV and DV, the IV still has a significant direct effect on the dependent variable that is not

accounted for by the mediator. On the other hand, full mediation occurs when the mediator explains thoroughly how the IV and DV are significantly related. When the mediator is considered, the direct effect of the IV on the DV is no longer significant.

In short, mediation would occur if the mediator had a significant indirect effect on the DV due to the IV. Partial mediation exists if the direct effect of the IV on the DV remains significant after controlling for the mediator in the model. Full mediation occurs if the indirect effect is significant, and the direct effect is no longer significant.

Therefore, it could be resolved that there is a partial mediation in the relationship between teachers' ICT competence and attitude towards digital use in teaching. This implies that techno-efficacy partially mediates the relationship between teachers' ICT competence and attitude towards digital use in teaching. It further suggests that there are other mediators as well that would influence the relationship between these two variables.

Table 3. Indirect and direct effects of the mediation model

Type	Path	Effect	Coeff.	p-value	Statistical Inference
Indirect	Path A*B	IC ⇒ TE ⇒ ATDUIT	0.023	0.002	Significant
Component	Path A	IC ⇒ TE	0.052	0.000	Significant
	Path B	TE ⇒ ATDUIT	0.436	0.000	Significant
Direct	Path C'	IC ⇒ ATDUIT	0.069	0.000	Significant

Moderation Results

Moderation analysis was utilized to gauge the moderating effect of school support on the relationship between ICT competence and attitude towards digital use in teaching. Table 4 reveals that the direct effect between ICT competence and attitude towards digital use in teaching is positive and significant (β=0.095, p=0.000). Meanwhile, the direct effect between school support and attitude towards digital use in teaching is also positive and significant (β=0.370, p=0.000). This suggests that ICT competence and school support in ICT integration predict attitudes towards digital use in teaching.

Memon et al. (2019) stated that a moderating effect occurs when a third variable modifies the correlation between two variables. The amount or value of the third variable mainly influences the intensity or direction of the relationship between the two initial variables. The interaction between the independent variable (IV), dependent variable (DV), and moderator must be statistically significant to be regarded as a statistical moderating effect. The analysis reveals that the moderating effect of school support on the relationship between ICT competence and attitude towards digital use in teaching is positive and highly significant (β=0.063, p=0.000). Therefore, this implies that school support moderates the relationship between teachers' ICT competence and attitude towards digital use in teaching. The small effect size suggests that other factors could play a more substantial role. This also highlights the need for schools to provide more targeted and strong support, such as tailored training and technical assistance, to better address teachers' needs and maximize the impact of ICT competence on teaching attitudes. To gain deeper insights into the moderation results, a slope analysis was performed, as shown below.

Table 4. Moderating effect of school support on the relationship between teachers' ICT competence and attitude towards digital use in teaching

Type	Effect	Coefficient	p-value	Statistical Inference
Direct	ICT Competence	0.095	0.000	Significant
	School Support	0.370	0.000	Significant
Moderating Effect	ICT Competence * School Support	0.063	0.000	Significant

**Tested at 0.05 level of significance – Moderation Analysis*

Simple Slope Analysis

Simple slope analysis was used to investigate the relationship between ICT competence and attitude towards digital use in teaching at different levels of school support as the moderating variable. Table 5 and Figure 4 reveal that if school support is at an average level, the relationship between teachers' ICT competence and the attitude towards digital use in teaching is significant (β=0.095, p=0.000). Meanwhile, the relationship between these two constructs is still positively significant (β=0.063, p=0.000) if the level of school support is low. On the other hand, if school support is high, the relationship between teachers' ICT competence and the attitude towards digital use in teaching becomes stronger (β=0.127, p=0.000). This implies that teachers' ICT competence predicts attitude towards digital use in teaching; nevertheless, the relationship between these two constructs becomes stronger with sufficient school support in ICT integration.

Table 5. Strength and direction of the relationship between teachers' ICT competence and attitude towards digital use in teaching depending on the level of school support

Level of School Support	Coefficient	p-value	Statistical Inference
Average	0.095	0.000	Significant
Low	0.063	0.000	Significant
High	0.127	0.000	Significant

**Tested at 0.05 level of significance – Moderation Analysis Slope Analysis*

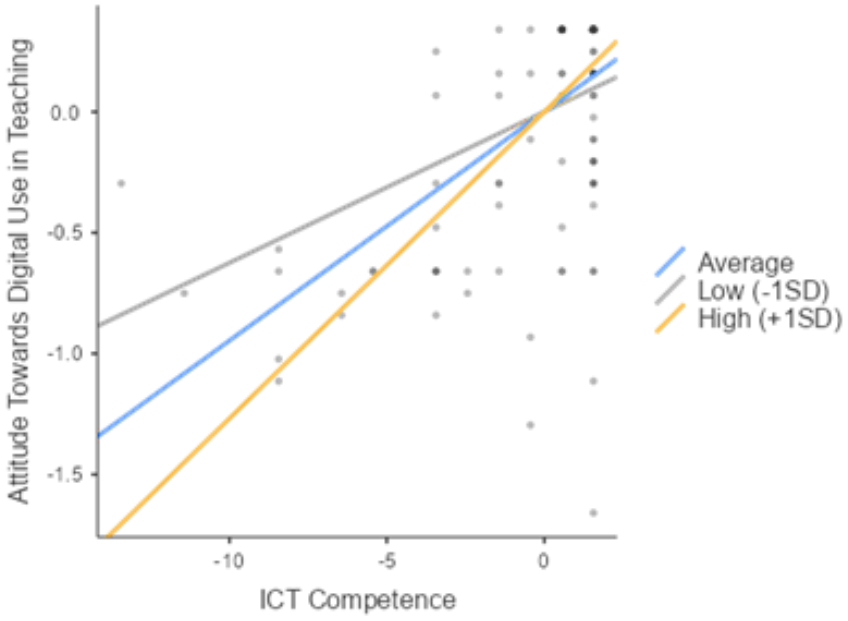

Figure 4. A plot of the Simple Slope Analysis

Discussion, Conclusion, and Recommendation

The mediation analysis suggests that teachers would have a greater level of techno-efficacy if they were more proficient in ICT. If they have remarkable techno-efficacy, they will be more enthusiastic and optimistic about using digital technologies in the classroom. Teachers more proficient in ICT would have higher confidence in their ability to use technology effectively. The level of techno-efficacy among teachers would affect how they feel about incorporating digital technology into their lessons. More techno-effective teachers would be more likely to have positive attitudes toward using digital technologies in the classroom because they believe they can successfully use technology to improve learning outcomes.

In assumption, techno-efficacy is crucial in mediating the relationship between teachers' ICT competence and attitude towards digital use in teaching. With this, school interventions designed to increase teachers' techno-efficacy would effectively promote more positive attitudes about using digital technologies in the classroom, especially among those with higher levels of ICT proficiency.

A growing body of literature examined how techno-efficacy mediates the connection between ICT skills and attitudes toward technology use in education. Below are several examples of relevant investigations:

Rohwer et al. (2022) stated that ICT competency facilitates teachers' use of digital tools and technology. It was mentioned that as teachers' ICT competence increases, their techno-efficacy also increases. ICT competence, on the other hand, influences how positively individuals view digital education. It is mentioned that using digital technologies in the classroom would be more beneficial if teachers believed they could utilize them effectively. On the other hand, teachers with low techno-efficacy would be less inclined to use digital technologies, resulting in a less favorable attitude toward its use in education. The study also cited that ICT competence, techno-efficacy, and attitude towards digital use in teaching

positively influenced one another.

Besides, Yener et al. (2021) investigated the mediating influence of technological self-efficacy, a concept similar to techno-efficacy, in the relationship between ICT competency and attitude toward ICT in education among Korean pre-service teachers. The results showed that technological self-efficacy partially mediated between ICT competence and attitude towards digital use in teaching.

Furthermore, the relationship between teachers' ICT competency and attitudes toward using digital teaching materials was examined by Wang and Zhao (2021). The researchers examined how teachers' technological pedagogical content knowledge (TPACK) mediated the relationship. The results revealed that TPACK partially mediated the relationship between ICT competence and attitude toward digital teaching materials, highlighting the significance of teachers' beliefs about the effective use of technology in the classroom in determining their attitudes toward those materials.

Overall, this finding demonstrates that the correlation between ICT competence and attitude towards digital use in teaching is mediated by techno-efficacy. This implies that initiatives to improve teachers' techno-efficacy would be beneficial in fostering more positive attitudes toward utilizing technology in the classroom.

On the other hand, the moderation analysis suggests that teachers with advanced ICT skills would be more interested in incorporating digital technology into their teaching practices. However, this effect can be strengthened or weakened depending on the level of school support that teachers receive. For instance, teachers' positive attitudes about the use of technology in education will be increased if they are provided with sufficient ICT infrastructure, resources, and training opportunities necessary to integrate it into their teaching methods properly. Contrariwise, a teacher with high ICT competency would still lose interest in implementing technology in the classroom if their school does not provide sufficient support, such as appropriate training or limited access to technology.

Moreover, if teachers collaborate with and learn various digital best practices from their colleagues, teachers are more likely to develop their information and communication technology skills and competence. Peer support can be provided in numerous ways, such as formal training programs, casual conversations, and peer coaching. This type of support from the school could also improve teachers' attitudes toward the use of digital tools in the classroom by enhancing their confidence and comfort with technology inside the classroom.

To put it another way, depending on the level of school support a teacher receives can either strengthen or weaken the positive correlation between their ICT skills and their attitude towards adopting digital technology in the classroom. This is the essence of a moderating influence.

The finding corroborates with Ifinedo et al. (2020) that teachers with high levels of ICT competency were more likely to have positive attitudes toward using digital technology in the classroom if their school and peers provided adequate support. It was shown that teachers' ICT proficiency was not substantially related to their positive attitude toward using digital technology in the classroom when they lacked institutional support. The study also mentioned that if their school does not offer enough technology or training, even a teacher with high ICT abilities may lose interest in digital use in teaching.

Another study conveys the same result. Raygan and Moradkhani (2020) discovered a correlation between teachers' attitudes toward technology use and their technological expertise. This correlation is attributed to the quality of assistance provided by institutions. Teachers with high levels of technical proficiency were more likely to have better attitudes toward incorporating technology when they received high levels of institutional support but not when they received low levels of support. Similarly, Dursun (2019) argued that school support influenced the relationship between pre-service teachers' attitudes and ICT competence and self-efficacy. Pre-service teachers were more likely to prefer ICT when they received considerable institutional support.

Moreover, the slope analysis generally indicates that school support controls the strength of the relationship between ICT competence and attitude towards digital use in teaching. Hence, the level of support a teacher receives from their school can significantly influence the strength and direction of this relationship. School support is required to ensure that teachers with high ICT proficiency also have positive attitudes toward using digital technology.

This further suggests that teachers are more likely to feel empowered and motivated to improve their ICT proficiency in schools with high support for ICT integration. They can access the latest technological tools, training courses, and best practices from experts. These can improve their ICT skills and effectively gain confidence in using digital technologies. Since ICT can enhance student engagement, collaboration, and academic performance, teachers in these institutions could have favorable attitudes toward incorporating it into their classes.

On the other hand, teachers could encounter difficulties obtaining and enhancing their ICT competence in schools where there is low support for ICT integration. There could be insufficient training opportunities, limited access to technological resources, and a lack of guidance regarding successfully incorporating ICT into teaching strategies. Teachers' attitudes toward using technology in the classroom could be negatively affected. As a result, there could be a reduced correlation between ICT competency and attitude toward using technology in the classroom in schools with less support.

Furthermore, the motivation and readiness of teachers to devote time and effort to enhancing their ICT competence can be influenced by the quality of school support. Teachers are more likely to participate in professional development activities and look for opportunities to improve their digital abilities when they believe in their school values and support the integration of ICT. This positive approach to professional development can result in improved ICT competence and, as a result, more favorable attitudes regarding the use of technology in education.

In conclusion, school support is essential in influencing the relationship between teachers' attitudes toward using technology in the classroom and their ICT skills. The development of teachers' ICT competence and the promotion of positive attitudes toward integrating digital technologies into their teaching practices can be facilitated by high levels of school support, including access to technology resources, professional development opportunities, and a supportive school culture. Nevertheless, inadequate assistance could hinder the development of ICT skills and result in less favorable views about the use of technology in education. Therefore, it is essential for educational institutions to recognize the importance of school support in fostering effective ICT integration and to consider providing teachers with the resources and support systems to prepare them for their transitions to digital teaching.

A substantial body of literature supports the claim that a teacher's level of ICT competency can be used to predict their attitude toward using digital technologies in the classroom. For instance, a study by Pongsakdi et al. (2021) indicated that teachers with greater ICT skill levels were more likely to have favorable attitudes regarding the use of digital technology in the classroom.

Additionally, Sailer et al. (2021) mentioned that when teachers receive enough support from their institutions and peers, the association between their attitude toward using digital technologies in the classroom and their ICT competency is increased. Teachers who received peer support and mentoring in integrating ICT were more likely to have positive views toward using digital technology in their classrooms. In a study with similar conclusions, Valverde-Berrocoso et al. (2021) and Borupand and Evmenova (2019) found that training, peer support, and school support were essential for improving teachers' ICT competency and attitudes about using digital technology in the classroom.

In conclusion, the study's findings prove that teachers' ICT competencies substantially influence their attitudes towards digital use in teaching. However, it was discovered that the degree of this relationship is enhanced when teachers receive adequate support from their institutions and peers to incorporate ICT into their teaching practices correctly.

Therefore, these findings underscore the significance of supplying teachers and students with sufficient information and communication technology (ICT) tools and devices, establishing a robust ICT infrastructure and computer laboratories, providing ongoing opportunities for professional development, fostering collaboration among teachers, encouraging the exploration of novel technologies and pedagogical methods, emphasizing supportive leadership, evaluating, and adjusting training programs. In addition, it is recommended that forthcoming studies explore additional variables that impact teachers' ICT competence and attitude towards digital use in teaching.

References

Abdul Hamid, M., Salleh, S., & Laxman, K. (2020). A study on the factors influencing students' acceptance of learning management systems (LMS): A Brunei case study. *International Journal of Technology in Education and Science*, *4*(3), 203-217. https://doi.org/10.46328/ijtes.v4i3.101

Ahmed, V., & Opoku, A. (2021). Technology supported learning and pedagogy in times of crisis: The case of COVID-19 pandemic. *Education and Information Technologies, 27*(1), 365-405. https://doi.org/10.1007/s10639-021-10706-w

AlAjmi, M. K. (2022). The impact of digital leadership on teachers' technology integration during the COVID-19 pandemic in Kuwait. *International Journal of Educational Research*, *112*, 101928. https://doi.org/10.1016/j.ijer.2022.101928

Ali, W. (2020). Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. *Higher Education Studies*, *10*(3), 16. https://doi.org/10.5539/hes.v10n3p16

Al-Mamary, Y. H. (2020). Examining the factors affecting the use of ICT in teaching in Yemeni schools. *Journal of Public Affairs*, *22*(1). https://doi.org/10.1002/pa.2330

Amhag, L., Hellström, L., & Stigmar, M. (2019). Teacher educators' use of digital tools and needs for digital competence in higher education. *Journal of Digital Learning in Teacher Education*, *35*(4), 203-220. https://doi.org/10.1080/21532974.2019.1646169

Anthony Jnr., B. (2021). An exploratory study on academic staff perception towards blended learning in higher education. *Education and Information Technologies*, *27*(3), 3107-3133. https://doi.org/10.1007/s10639-021-10705-x

Antonietti, C., Cattaneo, A., & Amenduni, F. (2022). Can teachers' digital competence influence technology acceptance in vocational education? *Computers in Human Behavior*, *132*, 107266. https://doi.org/10.1016/j.chb.2022.107266

Atanga, C., Jones, B. A., Krueger, L. E., & Lu, S. (2019). Teachers of students with learning disabilities: Assistive technology knowledge, perceptions, interests, and barriers. *Journal of Special Education Technology*, *35*(4), 236-248. https://doi.org/10.1177/0162643419864858

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182. https://doi.org/10.1037/0022-3514.51.6.1173

Barton, E. A., & Dexter, S. (2019). Sources of teachers' self-efficacy for technology integration from formal, informal, and independent professional learning. *Educational Technology Research and Development*, *68*(1), 89-108. https://doi.org/10.1007/s11423-019-09671-6

Beardsley, M., Albó, L., Aragón, P., & Hernández-Leo, D. (2021). Emergency education effects on teacher abilities and motivation to use digital technologies. *British Journal of Educational Technology*. https://doi.org/10.1111/bjet.13101

Bilbao Aiastui, E., Arruti Gómez, A., & Carballedo Morillo, R. (2021). A systematic literature review about the level of digital competences defined by DigCompEdu in higher education. *Aula Abierta*, *50*(4), 841-850. https://doi.org/10.17811/rifie.50.4.2021.841-850

Binti Daud, R. (2021). Face and Content Validity For The Special Education Leadership (Integration) Questionnaire In Malaysia. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(11), 5172-5178.

Bolaji, H. O., & Adeoye, M. A. (2022). Accessibility, Usability, and Readiness Towards ICT Tools for Monitoring Educational Practice in Secondary Schools in Ilorin Metropolis. *Indonesian Journal of Multidiciplinary Research*, *2*(2), 257-264. https://ejournal.upi.edu/index.php/IJOMR/article/download/48247/19584

Bond, M., Marín, V. I., Dolch, C., Bedenlier, S., & Zawacki-Richter, O. (2018). Digital transformation in German higher education: Student and teacher perceptions and usage of digital media. *International Journal of Educational Technology in Higher Education*, *15*(1). https://doi.org/10.1186/s41239-018-0130-1

Borup, J., & Evmenova, A. (2019). The effectiveness of professional development in overcoming obstacles to effective online instruction in a College of Education. *Online Learning*, *23*(2). https://doi.org/10.24059/olj.v23i2.1468

Bowman, M. A., Vongkulluksn, V. W., Jiang, Z., & Xie, K. (2020). Teachers' exposure to professional development and the quality of their instructional technology use: The mediating role of teachers' value and ability beliefs. *Journal of Research on Technology in Education*, *54*(2), 188-204. https://doi.org/10.1080/15391523.2020.1830895

Caena, F., & Redecker, C. (2019). Aligning teacher competence frameworks to 21st century challenges: The case for the European digital competence framework for educators (*<scp>Digcompedu)</scp>* . *European Journal of Education*, *54*(3), 356-369. https://doi.org/10.1111/ejed.12345

Campillo-Ferrer, J. M., & Miralles-Martínez, P. (2021). Effectiveness of the flipped classroom model on students' self-reported motivation and learning during the

COVID-19 pandemic. *Humanities and Social Sciences Communications*, *8*(1). https://doi.org/10.1057/s41599-021-00860-4

Chiu, T. K. (2022). School learning support for teacher technology integration from a self-determination theory perspective. *Educational technology research and development*, *70*(3), 931-949. https://doi.org/10.1007/s11423-022-10096-x

Clemen, I. G., Ali, H., Abdulmadid, A. N., & Jabbar, J. H. (2021). Education During COVID-19 Era: Readiness of Students in a Less-Economically Developed Country for E-Learning. *IMCC Journal of Science*, *1*(2), 94-101. https://www.econstor.eu/handle/10419/234960

DepED. (2016). *Do 35, S. 2016 – The Learning Action Cell as a K to 12 basic education program ScSchool-based continuing professional development strategy for the improvement of teaching and learning*. Department of Education. https://www.deped.gov.ph/2016/06/07/do-35-s-2016-the-learning-action-cell-as-a-k-to-12-basic-education-program-school-based-continuing-professional-development-strategy-for-the-improvement-of-teaching-and-learning/

DepED. (2022). *2022 Brigada Eskwela Implementing Guidelines*. Department of Education. https://www.deped.gov.ph/wp-content/uploads/2022/08/DM_s2022_062.pdf

DepED. (2023, January 23). *DM No. 026, s. 2023 | Microsoft 365 Adoption*. Deped Makati City | Deped Makati City. https://depedmakati.ph/index.php/2023/01/23/dm-no-026-s-2023-microsoft-365-adoption/

Deroncele-Acosta, A., Palacios-Núñez, M. L., & Toribio-López, A. (2023). Digital transformation and technological innovation on higher education Post-COVID-19. *Sustainability*, *15*(3), 2466. https://doi.org/10.3390/su15032466

Dong, Y., Xu, C., Chai, C. S., & Zhai, X. (2019). Exploring the structural relationship among teachers' Technostress, technological pedagogical content knowledge (TPACK), computer self-efficacy and school support. *The Asia-Pacific Education Researcher*, *29*(2), 147-157. https://doi.org/10.1007/s40299-019-00461-5

Dursun, O. O. (2019). Pre-service information technology teachers' self-efficacy, self-esteem and attitudes towards teaching: A four-year longitudinal study. *Contemporary Educational Technology*, *10*(2), 137-155. https://doi.org/10.30935/cet.554478

Eremie, I., & Agi, U. K. (2020). Information and Communication Technology (ICT) Skills and Efficient Management of Educational Resources in Public Secondary Schools. *Journal of the International Society for Teacher Education*, *24*(1), 36-47. https://files.eric.ed.gov/fulltext/EJ1304612.pdf

Ferrer-Estévez, M., & Chalmeta, R. (2021). Integrating sustainable development goals in educational institutions. *The International Journal of Management Education*, *19*(2), 100494. https://www.sciencedirect.com/science/article/pii/S1472811721000434

Fuente, J. A. D., & Biñas, L. C. (2020). Teachers' competence in information and communications technology (ICT) as an educational tool in teaching: An empirical analysis for program intervention. *Journal of Research in Education, Science, and Technology*, *5*(2), 61-76. https://jrest.net/index.php/jrest/article/view/50

Gomez, F. C., Trespalacios, J., Hsu, Y., & Yang, D. (2021). Exploring teachers' technology integration self-efficacy through the 2017 ISTE standards. *TechTrends*, *66*(2), 159-171. https://doi.org/10.1007/s11528-021-00639-z

González-López, Ó. R., Buenadicha-Mateos, M., & Sánchez-Hernández, M. I. (2021). Overwhelmed by Technostress? Sensitive archetypes and effects in times of forced digitalization. *International Journal of Environmental Research and Public Health*, *18*(8), 4216. https://doi.org/10.3390/ijerph18084216

Hafifah, G. N., & Sulistyo, G. H. (2020). Teachers' ICT Literacy and ICT Integration in ELT in the Indonesian Higher Education Setting. *Turkish Online Journal of Distance Education*, *21*(3), 186-198. https://doi.org/10.17718/tojde.762050

Hair, J., & Alamer, A. (2022). Partial least squares structural equation modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, *1*(3), 100027. https://doi.org/10.1016/j.rmal.2022.100027

Hashim, H. (2018). Application of technology in the Digital Era education. *International Journal of Research in Counseling and Education*, *1*(2), 1. https://doi.org/10.24036/002za0002

Hassan, R., & Bin Ismail, A. (2022). The development of Malaysia TVET teacher training (TT-TVET). *Technical and Vocational Education and Training: Issues, Concerns and Prospects*, 255-275. https://doi.org/10.1007/978-981-16-6474-8_16

Hayes, A. F. (2009). Beyond baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, *76*(4), 408-420. https://doi.org/10.1080/03637750903310360

Hidayat, D. N., Lee, J. Y., Mason, J., & Khaerudin, T. (2022). Digital technology supporting English learning among Indonesian university students. *Research and Practice in Technology Enhanced Learning*, *17*(1). https://doi.org/10.1186/s41039-022-00198-8

Hsu, S. (2017). Developing and validating a scale for measuring changes in teachers' ICT integration proficiency over time. *Computers & Education*, *111*, 18-30. https://doi.org/10.1016/j.compedu.2017.04.001

Huang, X., & Mayer, R. E. (2018). Adding self-efficacy features to an online statistics lesson. *Journal of Educational Computing Research*, *57*(4), 1003-1037. https://doi.org/10.1177/0735633118771085

Hwang, E. S., & Kim, J. K. (2023). Success factors of evidence-based training for pilots. *Information Development*, 026666692311591. https://doi.org/10.1177/02666669231159100

Ifinedo, E., Rikala, J., & Hämäläinen, T. (2020). Factors affecting Nigerian teacher educators' technology integration: Considering characteristics, knowledge constructs, ICT practices and beliefs. *Computers & Education*, *146*, 103760. https://doi.org/10.1016/j.compedu.2019.103760

Iliyasu, R., & Etikan, I. (2021). Comparison of quota sampling and stratified random sampling. *Biometrics & Biostatistics International Journal*, *10*(1), 24-27. https://doi.org/10.15406/bbij.2021.10.00326

Johnston, K. (2021). Key skills in the context of twenty-first-century teaching and learning. *Curriculum Change within Policy and Practice*, 85-104. https://doi.org/10.1007/978-3-030-50707-7_5

Karataş, T. Ö., & Tuncer, H. (2020). Sustaining language skills development of pre-service EFL teachers despite the COVID-19 interruption: A case of emergency distance education. *Sustainability*, *12*(19), 8188. https://doi.org/10.3390/su12198188

Kent, A. M., & Giles, R. M. (2017). Preservice Teachers' Technology Self-Efficacy. *SRATE Journal*, *26*(1), 9-20. https://files.eric.ed.gov/fulltext/EJ1134392.pdf

Kock, N. (2021). WarpPLS user manual: version 6.0. Laredo, *TX: ScriptWarp Systems*. https://scriptwarp.com/warppls/UserManual_v_8_0.pdf

Lai, C., Wang, Q., & Huang, X. (2022). The differential interplay of TPACK, teacher beliefs, school culture and professional development with the nature of in-service EFL teachers' technology adoption. *British Journal of Educational Technology*, *53*(5), 1389-1411. https://doi.org/10.1111/bjet.13200

Laver, K., George, S., Ratcliffe, J., & Crotty, M. (2011). Measuring technology self efficacy: Reliability and construct validity of a modified computer self efficacy scale in a clinical rehabilitation setting. *Disability and Rehabilitation*, *34*(3), 220-227. https://doi.org/10.3109/09638288.2011.593682

Lee, Y. (2023). Achieving success in English medium instruction using computer-mediated terminology pretraining under the problem-based learning pedagogy. *Journal of Computer Assisted Learning*. https://doi.org/10.1111/jcal.12777

Lupina, S. P. (2021). A Multiple Case Study on The Implementation of DepEd Computerization Program (DCP): School Heads' Initiatives In Focus. https://www.researchgate.net/profile/shane_lupina/publication/363632204_a_multiple_case_study_on_the_implementation_of_deped_computerization_program_dcp_school_heads'_initiatives_in_focus/links/6325e270873eca0c0094eeff/a-multiple-case-study-on-the-implementation-of-deped-computerization-program-dcp-school-heads-initiatives-in-focus.pdf

MacKinnon, D. P., & Valente, M. (2019). Mediation analysis. *Psychology*. https://doi.org/10.1093/obo/9780199828340-0245

Mahdum, M., Hadriana, H., & Safriyanti, M. (2019). Exploring teacher perceptions and motivations to ICT use in learning activities in Indonesia. *Journal of Information Technology Education: Research*, *18*, 293-317. https://doi.org/10.28945/4366

Mäkiniemi, J., Ahola, S., & Joensuu, J. (2020). A novel construct to measure employees' technology-related experiences of well-being: Empirical validation of the techno-work engagement scale (TechnoWES). *Scandinavian Journal of Work and Organizational Psychology*, *5*(1). https://doi.org/10.16993/sjwop.79

McFarlane, A. E. (2019). Devices and desires: Competing visions of a good education in the digital age. *British Journal of Educational Technology*, *50*(3), 1125-1136. https://doi.org/10.1111/bjet.12764

Memon, M. A., Cheah, J., Ramayah, T., Ting, H., Chuah, F., & Cham, T. H. (2019). Moderation analysis: Issues and guidelines. *Journal of Applied Structural Equation Modeling*, *3*(1), i-xi. https://doi.org/10.47263/jasem.3(1)01

Mitchell, P. (2021). Teacher Technology Self-Efficacy and its Impact on Instructional Technology Integration". *Doctor of Education Dissertations.* 58. https://digitalcommons.gardner-webb.edu/education-dissertations/58

Mittal, S., Mahendra, S., Sanap, V., & Churi, P. (2022). How can machine learning be used in stress management: A systematic literature review of applications in workplaces and education. *International Journal of Information Management Data Insights*, *2*(2), 100110. https://doi.org/10.1016/j.jjimei.2022.100110

Mumbing, L., Abequibel, B., Buslon, J., & Alieto, E. (2021). Digital Education, the New Frontier: Determining Attitude and Technological Competence of Language Teachers from a Developing Country. *Asian ESP Journal*, *17*(4.3), 300-328. https://www.asian-esp-journal.com/volume-17-issue-4-3-may-2021/

Mwapwele, S., Marais, M., Dlamini, S., & Biljon, J. (2019). Teachers' ICT adoption in South African rural schools: A study of technology readiness and implications for the South Africa connect broadband policy. *The African Journal of Information and Communication (AJIC)*, (24). https://doi.org/10.23962/10539/28658

Nikolopoulou, K., Gialamas, V., & Lavidas, K. (2021). Habit, hedonic motivation, performance expectancy and technological pedagogical knowledge affect teachers' intention to use mobile Internet. *Computers and Education Open*, *2*, 100041. https://doi.org/10.1016/j.caeo.2021.100041

Official Gazette. (2013, May 15). *Republic Act No. 10533 | Enhanced Basic Education Act of 2013*. Official Gazette of the Republic of the Philippines. https://www.officialgazette.gov.ph/2013/05/15/republic-act-no-10533/

Ogunjimi, B. E., Eyong, I. U., & Offon, E. U. (2022). Information literacy skills and the utilization of information resources by public health workers in federal neuro-psychiatric hospital Calabar. *Advances in Social Sciences Research Journal*, *9*(3), 84-100. https://doi.org/10.14738/assrj.93.10498

Otterborn, A., Schönborn, K., & Hultén, M. (2018). Surveying preschool teachers' use of digital tablets: General and technology education related findings. *International Journal of Technology and Design Education*, *29*(4), 717-737. https://doi.org/10.1007/s10798-018-9469-9

Özgür, H. (2020). Relationships between teachers' technostress, technological pedagogical content knowledge (TPACK), school support and demographic variables: A structural equation modeling. *Computers in Human Behavior*, *112*, 106468. https://doi.org/10.1016/j.chb.2020.106468

Paciente, J. (2022). Information and Communication Technology (ICT) Knowledge, Skills, And Attitude: Basis for DEPED Support System. *Psychology and Education: A Multidisciplinary Journal*, *3*(2), 125-137. https://zenodo.org/record/6865072

Pan, X. (2020). Technology acceptance, technological self-efficacy, and attitude toward technology-based self-directed learning: Learning motivation as a mediator. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.564294

Parinasan, M. A., Rosal, M. M., Kilag, O. K., Groenewald, C. A., Groenewald, E., & Gepitulan, P. M. (2024). Public Sector Management Education in the Philippines for 21st Century Governance: Challenges, Strategies, and Innovation. *International Multidisciplinary Journal of Research for Innovation, Sustainability, and Excellence (IMJRISE)*, *1*(3), 67-72.

Pongsakdi, N., Kortelainen, A., & Veermans, M. (2021). The impact of digital pedagogy training on in-service teachers' attitudes towards digital technologies. *Education and Information Technologies*, *26*(5), 5041-5054. https://doi.org/10.1007/s10639-021-10439-w

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717-731. https://doi.org/10.3758/bf03206553

Preacher, K. J., & Hayes, A. F. (2008). Contemporary approaches to assessing mediation in communication research. *The SAGE Sourcebook of Advanced Data Analysis Methods for Communication Research*, 13-54. https://doi.org/10.4135/9781452272054.n2

Preacher, K., Rucker, D., & Hayes, A. (2006). Demystifying moderated mediation: A unified framework for investigating conditional mediation effects in psychological research. *PsycEXTRA Dataset*. https://doi.org/10.1037/e633962013-648

Rana, K., & Rana, K. (2020). ICT integration in teaching and learning activities in higher education: A case study of Nepal's teacher education. *Malaysian Online Journal of Educational Technology*, *8*(1), 36-47. https://doi.org/10.17220/mojet.2020.01.003

Raygan, A., & Moradkhani, S. (2020). Factors influencing technology integration in an EFL context: Investigating EFL teachers' attitudes, TPACK level, and educational climate. *Computer Assisted Language Learning*, *35*(8), 1789-1810. https://doi.org/10.1080/09588221.2020.1839106

Rohwer, E., Flöther, J., Harth, V., & Mache, S. (2022). Overcoming the "Dark side" of technology—A scoping review on preventing and coping with work-related Technostress. *International Journal of Environmental Research and Public Health*, *19*(6), 3625. https://doi.org/10.3390/ijerph19063625

Roussinos, D., & Jimoyiannis, A. (2019). Examining primary education teachers' perceptions of TPACK and the related educational context factors. *Journal of Research on Technology in Education*, *51*(4), 377-397. https://doi.org/10.1080/15391523.2019.1666323

Sailer, M., Murböck, J., & Fischer, F. (2021). Digital learning in schools: What does it take beyond digital technology? *Teaching and Teacher Education*, *103*, 103346. https://doi.org/10.1016/j.tate.2021.103346

Sailer, M., Schultz-Pernice, F., & Fischer, F. (2021). Contextual facilitators for learning activities involving technology in higher education: The cь-model. *Computers in Human Behavior*, *121*, 106794. https://doi.org/10.1016/j.chb.2021.106794

Scherer, R., & Teo, T. (2019). Unpacking teachers' intentions to integrate technology: A meta-analysis. *Educational Research Review*, *27*, 90-109. https://doi.org/10.1016/j.edurev.2019.03.001

Schmid, M., Brianza, E., & Petko, D. (2021). Self-reported technological pedagogical content knowledge (TPACK) of pre-service teachers in relation to digital technology use in lesson plans. *Computers in Human Behavior*, *115*, 106586. https://doi.org/10.1016/j.chb.2020.106586

Semerci, A., & Aydın, M. K. (2018). Examining high school teachers' attitudes towards ICT use in education. *International Journal of Progressive Education*, *14*(2), 93-105. https://doi.org/10.29329/ijpe.2018.139.7

Siyam, N. (2019). Factors impacting special education teachers' acceptance and actual use of technology. *Education and Information Technologies*, *24*(3), 2035-2057. https://doi.org/10.1007/s10639-018-09859-y

Sprenger, D. A., & Schwaninger, A. (2021). Technology acceptance of four digital learning technologies (classroom response system, classroom chat, E-lEcturEs, and mobile virtual reality) after three months' usage. *International Journal of Educational Technology in Higher Education*, *18*(1), 1-17. https://doi.org/10.1186/s41239-021-00243-4

Štemberger, T., & Čotar Konrad, S. (2021). Attitudes towards using digital technologies in education as an important factor in developing digital competence: The case of Slovenian student teachers. *International Journal of Emerging Technologies in Learning (iJET)*, *16*(14), 83. https://doi.org/10.3991/ijet.v16i14.22649

Taber, K. S. (2017). The use of Cronbach's Alpha when developing and reporting research instruments in science education. *Research in Science Education*, *48*(6), 1273-1296. https://doi.org/10.1007/s11165-016-9602-2

Thurm, D., & Barzel, B. (2020). Effects of a professional development program for teaching mathematics with technology on teachers' beliefs, self-efficacy and practices. *ZDM*, *52*(7), 1411-1422. https://doi.org/10.1007/s11858-020-01158-6

Treceñe, J. K. (2021). The digital transformation strategies of the Philippines from 1992 to 2022: A review. *Engineering & Technology Review*, *2*(1), 8-13. https://doi.org/10.47285/etr.v2i1.66

Tursunalievich, A. Z., & Rahmat, A. (2021). Challenges in developing a digital educational environment. *Aksara: Jurnal Ilmu Pendidikan Nonformal*, *7*(2), 247. https://doi.org/10.37905/aksara.7.2.247-254.2021

Valverde-Berrocoso, J., Fernández-Sánchez, M. R., Revuelta Dominguez, F. I., & Sosa-Díaz, M. J. (2021). The educational integration of digital technologies precovid-19: Lessons for teacher education. *PLOS ONE*, *16*(8), e0256283. https://doi.org/10.1371/journal.pone.0256283

Wang, Q., & Zhao, G. (2021). ICT self-efficacy mediates most effects of university ICT support on preservice teachers' TPACK: Evidence from three normal universities in China. *British Journal of Educational Technology*, *52*(6), 2319-2339. https://doi.org/10.1111/bjet.13141

Wasserman, E., & Migdal, R. (2019). Professional development- Differences in teachers' attitudes between online and traditional training courses. *Online Learning*, *23*(1). https://doi.org/10.24059/olj.v23i1.1299

Wei, H., & Chou, C. (2020). Online learning performance and satisfaction: Do perceptions and readiness matter? *Distance Education*, *41*(1), 48-69. https://doi.org/10.1080/01587919.2020.1724768

Wilson, M. L. (2021). The impact of technology integration courses on preservice teacher attitudes and beliefs: A meta-analysis of teacher education research from 2007–2017. *Journal of Research on Technology in Education*, *55*(2), 252-280. https://doi.org/10.1080/15391523.2021.1950085

Winwood, J. (2019). Using interviews. In *Practical Research Methods in Education* (pp. 12-22). Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9781351188395-2/using-interviews-jo-winwood

Yener, S., Arslan, A., & Kilinç, S. (2020). The moderating roles of technological self-efficacy and time management in the technostress and employee performance relationship through burnout. *Information Technology & People*, *34*(7), 1890-1919. https://doi.org/10.1108/itp-09-2019-0462

Zhao, Y., Pinto Llorente, A. M., & Sánchez Gómez, M. C. (2021). Digital competence in higher education research: A systematic literature review. *Computers & Education*, *168*, 104212. https://doi.org/10.1016/j.compedu.2021.104212

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