Digital Competence, Attitude, and Technology Utilization in Physical Education: Implication to Instructional Strategy

OMAN ABIERA BELISARIO [1]

[1] Liceo de Cagayan University, Cagayan de Oro City, Philippines
https://orcid.org/0009-0009-5557-4945

Corresponding Author: obelisario50549@liceo.edu.ph

Originality: 100%   Grammarly: 99%   Plagiarism: 0%

ABSTRACT

The digital revolution in education presents formidable challenges for teachers and students, particularly in regions with limited access to comprehensive training and reliable internet connections. This study examined the teachers' level of digital competence, attitude toward digital instruction, and utilization of digital technology as an instructional strategy. It also investigated the relationships between these variables and whether they predict teachers' preparedness for using digital technology in physical education. This descriptive correlational and causal-predictive research was gathered from the randomly selected 300 students in a public senior high school in Bukidnon, Philippines. The results revealed that teachers generally demonstrated a high level of preparedness, positive attitudes,

and extensive technology utilization in physical education. Moreover, the study established significant relationships among digital competence, attitude, and technology use, further revealing attitude as the most influential predictor of teachers' utilization of digital technology as a physical educational instructional strategy. In conclusion, this study emphasizes the crucial role of nurturing positive attitudes and enhancing digital literacy among teachers to facilitate effective technology integration in physical education. It underscores the ongoing need for continuous teacher training and support to improve competence and attitude.

INTRODUCTION

The advancement of digital technology within educational environments presents notable obstacles for educators and students. One key factor necessitating further proficiency and pedagogical knowledge among teachers is the availability of comprehensive training programs to effectively integrate technology into their teaching. Additionally, the lack of reliable internet connections, computers, and devices, particularly in far-flung areas, makes it challenging for teachers to implement technology effectively and limits students' exposure to digital learning opportunities. Thus, this hinders the classroom's development of interactive digital learning experiences. Despite the increasing focus on digital technology in various academic disciplines, there remains a need to explore teachers' preparedness and the implications of utilizing digital technology, particularly in physical education. Hanell's (2018) study findings indicate that a lack of digital competence among educators in Sweden leads to deficiencies inside educational institutions and hampers their capacity to utilize digital resources that significantly benefit learners. The finding is supported by the research conducted by Viberg et al. (2020). According to Abella and Rosa (2023), lacking adequate digital competency among faculty, students, and administrative staff may prevent the Philippines' educational institutions from utilizing digital resources to their full potential.

In the Philippine setting, given that Filipinos are among the most avid internet and social media users in the world (Chua, 2021; Howe, 2023), it may be argued that digital teaching in far-flung areas is feasible (Espinosa et al., 2023). However, educators must have adequate training to use this pedagogical approach effectively. Additionally, the prevailing issues about internet accessibility and the nation's digital infrastructure and technology provide considerable challenges within the educational system. Moreover, many studies indicate that educators perceive incorporating technology into pedagogical approaches as a complex and demanding innovation. One main contributing factor is the need for

more technological proficiency, expertise, and self-confidence (Tanucan et al., 2021). Hence, it is imperative to assess teachers' digital proficiency, instructional strategies, and preparedness in Valencia City, Bukidnon, Philippines, to facilitate incorporating digital technology into physical education.

It is essential to advocate for the integration of digital technology in educational settings (Howard et al., 2021). A teacher's preparedness to use technology in the classroom can be determined by several important variables, including technical skill, practical application, successful technology use, and a desire to participate in transformational instructional activities (Tanucan et al., 2021). Aside from the association of teachers' age and teaching experience with their knowledge of digital technologies, other research also underlines the relationship between teacher preparedness regarding behavioral attitude and the use of information and technological content knowledge in teaching (Harris & Hofer, 2017). Furthermore, a similar study on Filipino physical education teachers' technical knowledge showed a significant association between their basic understanding of technology, its pedagogy, context, and other associated classifications.

Significant research efforts have focused on integrating technology into education. Among these research studies is the research conducted by Taylor et al. (2021), which focuses on the formulation and implementation of digital technology strategies in the context of teaching and learning within the education system of South Australia. A separate investigation was conducted to examine the level of readiness and receptiveness among instructors toward information communication technology and the impact and implementation strategies of ICT integration (Hero, 2020). Nevertheless, within the realm of physical education, the researcher has yet to see any comparable study that delves into the correlation between instructors' level of readiness and the utilization of digital technology as an educational tool. In contrast to the studies mentioned above that primarily examined individual variables and the correlation between teachers' preparedness and ICT, the present study aims to investigate the association between teachers' preparedness and the utilization of digital technology within the context of instructional strategy in physical education. The researcher chose the province of Bukidnon, Philippines, as he is a resident of the said province. Thus, the study results can pave the way for more studies on teachers' preparedness for using digital technology to improve and discover better teaching strategies in physical education and general subjects.

FRAMEWORK

The theoretical foundation of this study is predominantly rooted in Davis's (1989) Technology Acceptance Model (TAM) theory. TAM suggests that external and social factors influence an individual's desire to use technological tools in educational settings, including perceived ease of use, usefulness, and the intention to use them. This theoretical framework emphasizes the need to understand the user's perspective concerning the adoption and utilization of technology. Additionally, Snetselaar and Delehanty (2017) added that TAM considers a person's technological point of view and Internet use, making it a comprehensive framework for understanding technical use.

Digital Competence pertains to individuals' knowledge, skills, and abilities in effectively utilizing digital tools and technologies (Redecker & Punie, 2017). It encompasses a range of components, including technical skills, digital literacy, information management, communication, and problem-solving abilities in a digital framework.

Additionally, an attitude encompasses an individual's viewpoint, cognitive processes, and affective responses about using digital tools and technology within an educational environment.

It includes a person's propensity, preferences, and overall mindset toward using digital technology in teaching and learning (Kay & Greenhill, 2010). Positive attitudes towards digital technology involve recognizing its potential benefits, regarding it as a valuable tool for learning and productivity, and holding a favorable opinion of its impact on various aspects of life and work.

Moreover, this study also includes the Teacher Self-Efficacy (TSE) theory by Tschannen-Moran and Hoy (2001), based on the Social-Cognitive -Theory of Albert Bandura (1986), which focuses on teachers' self-belief in their ability to teach effectively in three domains: classroom discipline, student engagement, and instructional strategies. Incorporating TAM and TSE would support the study's conceptual framework more significantly in determining teachers' preparedness for digital technology in physical education.

The study's independent variables are teachers' preparedness regarding digital competence, including digital skills, citizenship, and attitude. Digital competence encompasses the aptitude to proficiently and ethically use digital tools, whereas digital skills pertain to particular proficiencies associated with digital technology. Digital citizenship includes the conscientious and ethical utilization of digital technology. The study's dependent variable is digital technology as a physical education instructional strategy, which relates to using digital technology in physical education instruction.

Independent Variable

Teachers' Digital Competence
- Digital Skills
- Digital Citizenship

Dependent Variable

Digital Technology as a Physical Education on Utilization of Instructional Strategy

Teachers' Attitude toward Digital Instruction
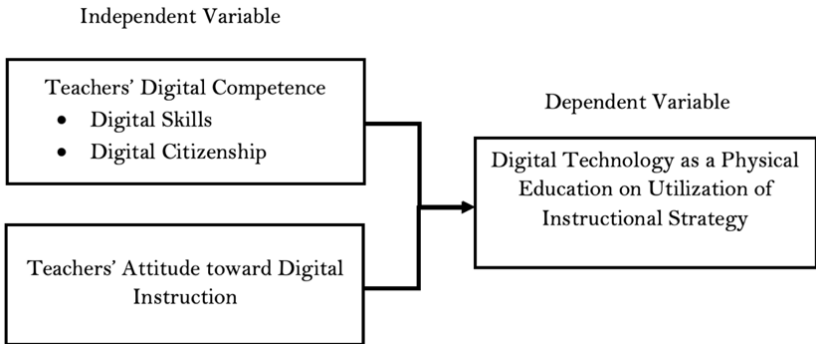
Figure 1. Schematic Presentation of the Variables in the Study

METHODOLOGY

Research Design

A descriptive-correlation research design was used to examine relationships between variables, and causal-predictive research explores cause and effect by comparing groups exposed to different conditions. Quantitative research analyzes numerical data for objective, reliable results applicable to larger populations.

Respondents

The study included 300 Grade 12 students from a public high school in Valencia City, Bukidnon, Philippines, enrolled in physical education classes during the school year 2023–2024. Simple random sampling was employed to ensure equal representation. The Raosoft calculator determined the sample size of 300 out of a population of 1,366 Grade 12 students, aiming for a 95% confidence level, a 5% margin-of-error, and a 50% response distribution.

Instrumentation

The study utilized survey questionnaires adapted from previous research. The independent variable, assessing teachers' digital competence, was derived from a study by Dias-Trindade and Moreira (2020). The questionnaire for attitude assessment was adapted from Osamende and Frederick's (2016) research in Kumasi, Ghana. The dependent variable, evaluating digital technology as a physical education instructional strategy, was adapted from Ghavifekr and Rosdy's

(2015) work on ICT integration in schools. Experts validated the questionnaires and adjusted them for student respondents.

The questionnaire underwent reliability testing to ensure appropriateness and consistency before broader dissemination. Cronbach's alpha was utilized to evaluate the reliability and internal consistency of the data, resulting in a reliability coefficient of 0.763 for teachers' digital competence, 0.880 for teachers' attitude, and a reliability coefficient of 0.824 for digital technology instructional strategy according to Taber (2018), a value of approximately 0.70 or higher is commonly regarded as desirable.

Data Gathering

The researcher followed the University Research Protocol, obtaining clearance from the University Research Ethics Board and approval from the university administration. Ethical protocols were maintained throughout the study, with an orientation for participants, detailed explanations of the Informed Consent Form, and Assent to ensure confidentiality was upheld. Participation was voluntary, and withdrawal was allowed; participants were not compensated. After everything was clear, the modified-adapted questionnaire was floated to participants, and the data gathered were tabulated, analyzed, and interpreted.

Statistical Treatment

For problem numbers 1, 2, and 3, the researcher used descriptive statistics analysis, such as the mean and standard deviation, to measure teachers' preparedness and digital technology effectiveness in physical education. Problem 4 utilized Pearson r to identify the connection between preparedness and technology use. For problem 5, multiple linear regression was employed to accurately predict teachers' preparedness within the specific context of the Physical Educational Instructional Strategy.

RESULTS AND DISCUSSION

Problem 1. What is the teachers' level of digital competence?

Table 1 displays the extent of digital proficiency among the teachers. As depicted in the table, respondents obtained the highest mean score of M=4.62, SD=.602 for item number 8, "The teacher provides reliable information and resources. Checks if the information is reliable and identify fake news," followed by item number 10, "The teacher verifies and evaluates the credibility of information to identify fabricated or fake news" with a mean score of M=4.50, SD=.760. On the other hand, respondents obtained the lowest mean score of

M=3.61, SD=1.31 for item number 6 "The teacher monitors students' behavior and engagement in collaborative digital environments (Google et al. Poll, Zoom, Group Chats, Whiteboard, etc.)" followed by item number 1 "The teacher uses different digital communication channels (Email, Gmail, Google Meet, Zoom, Messenger, etc.) for different purposes" followed by item number" with a mean score of M=3.68, SD=1.27. The overall mean score is M=4.11, SD=1.00, described as often and interpreted as high. The results presented in this study indicate that teachers exhibit a significant level of digital competence, as assessed by the respondents.

Table 1

Teachers' Level of Digital Competence

	Indicators	Mean	SD	Description	Interpretation
1	The teacher uses different digital communication channels, such as email, Gmail, Google Meet, Zoom, Messenger, etc., for different purposes.	3.68	1.27	Often	High
2	The teacher uses different internet sites (Google, Yahoo, Microsoft Edge, etc.) and digital resources (YouTube, Videos, PowerPoint Presentations, Images, Sound, etc.) to employ in teaching.	4.16	.946	Often	High
3	The teacher can do basic digital operations (Microsoft Office, Canva, Camtasia, Online Games, PDF, etc.), create their own digital resources and modify existing ones to adapt them to students' learning needs.	4.35	.941	Often	High
4	The teacher uses digital technologies to solve concrete problems	3.74	1.11	Often	High
5	The teacher addresses the problems of students with digital format and application (technical difficulties and technical errors)	3.73	1.12	Often	High

6	The teacher monitors students' behavior and engagement in collaborative digital environments (Google Classroom, Messenger Poll, Zoom, Group Chats, Whiteboard, etc.)	3.61	1.31	Often	High
7	The teacher effectively protects sensitive content (Racism, LGBTQA+, Pornography, etc.)	4.46	.862	Often	High
8	The teacher provides reliable information and resources. Check if the information is reliable and identify fake news.	4.62	.602	Always	Very High
9	The teacher teaches students how to behave safely and responsibly online or through digital platforms (Twitter, Instagram, Facebook, TikTok, etc.)	4.23	1.08	Often	High
10	The teacher verifies and evaluates the credibility of information to identify fabricated or fake news.	4.50	.760	Always	Very High
	Over-all Mean	4.11	1.00	Often	High

This result corroborates the assertions made by Teo (2011), Darling-Hammond et al. (2017), and Aslam et al. (2021) regarding the variability in teachers' digital competence and its enhancement through ongoing professional development and training sessions. This is due to teachers' recognition of the importance of computer use and internet navigation proficiency. They realize that students enjoy a more productive learning experience when technology is incorporated into the educational process.

In today's educational environment, educators understand the significance of possessing digital competence, particularly as most schools have transitioned to blended learning. It is, therefore, a must for all teachers to level up their digital competence for them to effectively deliver their lessons to the learners. A study conducted by Jelena (2023) stated that integration of digital technology within physical education yields substantial enhancements, notably in elevating educators' expertise, honing competencies in planning, organizing, and evaluating instructional methods, facilitating the monitoring of students' physical advancements and academic progress, and fostering improved communication skills across all stakeholders engaged in the educational realm.

Problem 2. What is the level of teachers' attitude toward digital instruction?

Table 2 presents the teachers' level of teachers' attitude toward digital instruction. As shown in the table, respondents obtained the highest mean score of M=4.56, SD=.712 for item number 1, "The teacher employs digital technology to enhance the quality of learning and teaching," followed by item number 7, "The teacher uses digital technology to make it enjoyable for students" with a mean score of M=4.53, SD=.645.

Table 2

Level of Teachers' Attitude toward Digital Instruction

	Indicators	Mean	SD	Description	Interpretation
1	The teacher employs digital technology to enhance the quality of learning and teaching.	4.56	.712	Always	Very Positive
2	The teacher uses various learning methods for students in physical education using digital technology.	4.28	.920	Often	Positive
3	The teacher has enough technological equipment appropriate for the class size.	4.24	.934	Often	Positive
4	The teacher makes an effort to apply various technology within the class.	4.51	.733	Always	Very High
5	The teacher is knowledgeable in using digital technology.	4.31	.811	Often	Positive
6	The teacher shows confidence in the current ability to use technology for teaching.	4.41	.741	Often	Positive
7	The teacher uses digital technology to make it enjoyable for students.	4.53	.645	Always	Very Positive
8	The teacher shows ease while using digital technology in teaching.	4.35	.793	Often	Positive
9	The teacher embraces challenges positively when troubleshooting or technical problems occur.	4.36	.863	Often	Positive
10	The teacher uses digital technology to promote students' motivation and participation.	4.27	.925	Often	Positive
	Over-all Mean	4.38	0.80	Often	Positive

On the other hand, respondents obtained the lowest mean score of M=4.24, SD=.934 for item number 3, "The teacher has enough technological equipment appropriate for the class size," followed by item number 10, "The teacher uses digital technology in promoting students' motivation and participation" with a mean score of M=4.27, SD=.925. The overall mean score is M=4.38, SD=.80, which is described as often and interpreted as positive. This data revealed that teachers exhibit a positive attitude toward Digital Instruction, as assessed by the respondents.

The data analysis findings indicate that teachers have a notably positive attitude toward digital instruction. This is consistent with the claims made by Fraillon et al. (2014), who suggested that teachers who are well-prepared and possess confidence in their abilities as digital citizens are not only better able to navigate the digital landscape themselves but also excel in teaching their students the values of responsible technology use. This premise can be further elucidated by considering how such teachers serve as exemplary role models, fostering a culture of digital responsibility within the classroom environment.

The present data underscores the vital role that educators' attitudes and competencies play in shaping their students' digital attitudes and behaviors. The positive attitude toward digital instruction among the respondents not only echoes the sentiments of Fraillon et al. (2014) but also reinforces the assertion that well-prepared and confident teachers are indispensable catalysts for cultivating responsible digital citizenship among the younger generation. This paradigm shift signifies a promising future in which educators are not just instructors but also stewards of digital ethics and responsible technology use.

Additionally, it is imperative to emphasize that educators who exhibit a favorable disposition towards digital instruction manifest this attitude within their classrooms and extend it into the broader professional realm. This multifaceted expression of positivity underscores their confidence in imparting knowledge to their students and disseminating their digital expertise to their peers and colleagues, thereby fostering a strong culture of digital learning and collaboration within educational communities.

Furthermore, findings from research by Galaraga and Reynato (2022) show a notably high level of digital competence among teachers and a generally positive attitude toward digitized instruction. Teachers exhibited a very high level of readiness for digitized education. Notably, digital competence and attitude significantly predict teachers' readiness for digitized instruction. Consequently, teachers must enhance their digital and technological proficiency and foster positive attitudes toward information and communications technology, fostering an eagerness for technology-driven teaching.

Problem 3. What is the Teachers' Level of Utilization of Digital Technology as a Physical Education Instructional Strategy?

Table 3 displays the extent to which teachers employ digital technology as a strategy in physical education instruction. As depicted in the table, participants achieved the highest average score with M=4.68 and a standard deviation of SD=.556 for item number 2. "The use of digital technology helps students to find related knowledge and information for learning," followed by item 1, "Digital technology allows students to be more creative and imaginative," with a mean score of M=4.62, SD=.650. On the other hand, respondents obtained the lowest mean score of M=3.81 and SD=1.03 for item number 8, "The students are more behaved and under control with the use of digital technology."

Table 3

Teachers' Level of Utilization of Digital Technology as a Physical Education Instructional Strategy

	Indicators	Mean	SD	Description	Interpretation
1.	Digital technology allows students to be more creative and imaginative.	4.62	.650	Always	Very High
2.	The use of digital technology helps students to find related knowledge and information for learning.	4.68	.556	Always	Very High
3.	The use of digital technology encourages students to communicate more with their classmates.	4.40	.869	Often	High
4.	Digital technology increases students' confidence to participate actively in the class.	4.19	.915	Often	High
5.	Students learn more effectively with the use of digital technology.	4.14	.867	Often	High
6.	The use of digital technology helps to broaden students' knowledge paradigm.	4.23	.817	Often	High
7.	The use of digital technology helps to improve students' ability, specifically in reading and writing.	4.22	.927	Often	High

8.	The students behave better and are under control using digital technology.	3.81	1.03	Often	High
9.	The use of digital technology enables students to express their ideas and thoughts better	4.24	.939	Often	High
10.	Digital technology promotes active and engaging lessons for students' best learning experience.	4.41	.794	Often	High
	Over-all Mean	4.29	0.83	Often	High

Subsequently, item number 5 is succeeded by item number 4. "Digital technology increases students' confidence to participate actively in the class," with a mean score of M=4.14 and SD=.867. The overall mean score is M=4.29, SD=.83, which is described as often and interpreted as high. This data revealed that the teachers highly utilize digital technology as a physical education instructional strategy.

The results show that Physical Education has undergone a transformational revolution because digital technology offers enormous potential to improve teaching methods. Teachers have grown accustomed to utilizing various digital technology in the teaching-learning process. A growing body of research emphasizes the crucial part that digital tools and platforms have played in this transformation, and evidence from reputable sources supports this. It is supported by the vital work of Gamage et al. (2022), which shows Moodle's effectiveness in this situation, demonstrating its ability to increase student involvement, performance, and knowledge of the content covered in class. These platforms enable educators to give students access to multimedia resources that enrich their educational experiences. Integrating Digital Game-Based Learning (DGBL) and Gamification in physical education can enhance academic and motivational outcomes in university learning, extending beyond traditional focus areas like physical performance or health improvement (Camacho-Sánchez et al., 2022).

Furthermore, as emphasized in a study conducted by Coughlin et al. (2015), mobile applications have exhibited the capacity to increase students' comprehension of nutrition and foster the development of healthy behaviors. The incorporation of mobile applications has broadened the scope of physical education beyond conventional classroom environments. The study by Gil-

Espinosa et al. (2022) examines the functionalities of smartphone applications, exploring their capacity to foster students' physical literacy and promote participation in physical activities during leisure time.

The body of research that has already been done emphasizes the value of using digital technology as a teaching tool in physical education. Online tools, gamification, real-time feedback systems, and mobile apps have all been shown to be effective strategies for motivating kids, getting them moving, and encouraging other healthy habits. To properly utilize the potential of digital technology, however, educators must get thorough training and assistance to successfully incorporate these technologies into their educational methods. Continuing research in this field holds the potential to uncover innovative and advanced approaches for leveraging digital technology as an efficient teaching tool in physical education.

Problem 4. Is there a significant relationship between teachers' utilization of digital technology as a physical, educational instructional strategy and digital competence and attitude toward digital instruction?

Table 4 presents the Pearson Correlation Analysis for the significant relationship between teachers' utilization of digital technology as a physical, educational instructional strategy, digital competence, and attitude to digital instruction. As shown in the table, digital competence ($p<.05$) and teachers' attitudes ($p<.05$) have probability values lower than the alpha value of 0.05; thus, the null hypothesis was rejected. It discloses a positive correlation between teachers' digital proficiency, attitude, and utilization of digital technology as an instructional approach in physical education. When teachers enhance their digital competence and develop positive attitudes, they also increase their utilization of digital technology in physical education instruction, alongside improvements in their digital competence and attitude towards digital teaching.

Table 4

Pearson Correlation Analysis for the Significant Relationship between Teachers' Utilization of Digital Technology as Physical Educational Instructional Strategy, Digital Competence, and Attitude to Digital Instruction

Variables	N	R	P-value	Interpretation
Digital Competence	300	.455	.000	Significant
Teachers' Attitude	300	.553	.000	Significant

*Correlation is significant at the 0.05 level (2-tailed).

Integrating digital technology into physical education teaching has become a notable focus in education. This research underscores the intricate connection between teacher readiness, encompassing digital proficiency and mindset, and the effective use of digital technology as an instructional approach. This analysis was built upon empirical evidence from various studies within this domain. Above all, it is essential to recognize that effective teacher training, encompassing digital skills and the right mindset, is a fundamental requirement for incorporating digital technology into physical education, as Martínez-Rico et al. (2021) emphasized. The ability to effectively use digital tools requires knowledge, abilities, and attitudes known as "digital competence," which is becoming recognized as a critical component of successful technology adoption in education. This assertion is supported by research, with studies like Howard et al. (2021) outlining that digital competency involves vital expertise, abilities, and attitudes crucial for the responsible and efficient use of digital tools. It denotes a collection of competencies and practices enabling individuals to adeptly employ new technologies for diverse purposes, encompassing education, work, and leisure. Particularly in education, this digital proficiency proves indispensable for educators aiming to seamlessly integrate technology into their teaching methods, ensuring students can fully leverage the benefits of digital learning (Tondeur et al., 2023).

Teachers' perspectives on digital technologies also play a complementary role in this dynamic. According to Howard et al. (2021), a positive attitude toward technology encourages a positive outlook and inspires educators to experiment and explore digital technologies in their teaching methods. A study by Singh (2021) emphasizes the importance of digital technology in education. It suggests that a positive attitude toward technology can help educators embrace and effectively use digital tools in their teaching.

Professional development initiatives and training programs are crucial for enhancing teacher readiness. In a study by Wu et al. (2013), structured training programs positively improve teachers' digital competence and attitudes toward technology use. Consequently, due to these initiatives, teachers are inclined to incorporate digital resources into their teaching, equipped with fundamental knowledge and skills. This correlation demonstrates that teachers' inclination to utilize digital technology as a pedagogical approach directly corresponds to improving their digital proficiency and positive attitudes through practical training and development programs. The combination of data from these researches highlights the critical importance of teachers' attitudes and digital competence in using digital technology as an instructional strategy in

physical education. The link between the heightened incorporation of digital technologies in educational methods and the enhancement of teachers' digital proficiency and favorable outlooks toward technology is observable. It is crucial to construct professional development programs and training activities that concurrently improve digital proficiency and attitudes to promote a cohesive influence that enhances the incorporation of digital technology into physical education instruction. The aforementioned symbiotic interaction highlights the necessity for a comprehensive approach to teacher preparedness in the digital age.

Problem 5. Do teachers' digital competence and attitude significantly predict teachers' utilization of digital technology as a physical educational instructional strategy?

Table 5 displays the Multiple Regression Analysis results for the variables that significantly forecast teachers' adoption of digital technology as an instructional strategy in physical education. The table shows that the R-value is .570, which implies a moderate positive correlation between the dependent and independent variables. The R^2 value of .324 revealed that the independent variables, namely digital competence and teachers' attitudes, explained 32.4% of the Teachers' Utilization of Digital Technology as a Physical Educational Instructional Strategy variability. In addition, the probability value of .000 ($p<.05$) indicates a significant positive correlation between the dependent and independent variables.

Table 5

Multiple Regression Analysis for the Variables that Significantly Predict Teachers' Utilization of Digital Technology as Physical Educational Instructional Strategy

	Unstandardized Coefficients		Standardized Coefficients			Interpretation
Variables	B	Std. Error	Beta	t	Sig.	
(Constant)	1.61	.226		7.13	.000	
Digital Competence	.158	.056	.174	2.83	.005	Significant
Teachers' Attitude	.463	.064	.443	7.19	.000	Significant
R = .570		R^2 =.324		F=71.33 P-		Value=.000

Furthermore, teachers' attitudes (p<.05) emerged as the best predictor (Beta=.443), followed by digital competence (p<.05), with a beta coefficient value of Beta=.174. The regression equation of the study is $Y= 1.61 + .158X_1 + .463X_2$

Where Y is the Dependent Variable

1.61 is the B Constant

X_1 is the Digital Competence

X_2 is the Teachers' Attitude

This data unveils a significant positive correlation (R-value of .570) between teachers' digital competence, attitudes, and utilization of digital technology as an instructional strategy in physical education. This correlation aligns with established theoretical frameworks such as the Technology Acceptance Model (TAM) and Teacher Self-Efficacy (TSE) theory. These theories emphasize the role of external and social factors in shaping individuals' willingness to adopt technology in education and educators' confidence in effectively integrating it into their teaching practices. The regression analysis further shows that teachers' attitudes (Beta=.443) and digital competence (Beta=.174) significantly influence the utilization of digital technology in physical education, reaffirming the theories underpinning this study.

The analysis reveals that a minor increase in digital competence corresponds to a .158 increase in Teachers' Utilization of Digital Technology as a Physical Educational Instructional Strategy. In contrast, a similar increase in teachers' attitudes results in a more substantial .463 increase in utilization. This observation highlights the growing importance of technology adoption in physical education, reflecting the prevalent digital era across various educational domains. Educators' prioritization of technology integration is understandable, given its potential to transform teaching methods and enhance student engagement.

The multiple regression analysis validates a positive correlation between the independent variables, including digital competence and teachers' attitudes, and the dependent variable, teachers' implementation of digital technology as an instructional strategy in physical education. This connection signifies that as digital proficiency and teachers' attitudes improve, the incorporation of digital technology into physical education also rises. This discovery aligns with previous research, highlighting the importance of teachers' confidence in their digital competence, as Fraillon et al. (2014) emphasized. Teachers with solid digital competence are more inclined to effectively integrate technology into their teaching, leading to heightened student engagement.

Furthermore, the R-squared (R2) value of 0.324 offers valuable insights by revealing that teachers' attitudes and digital competence explain 32.4% of the variance in utilizing digital technology as an instructional strategy in physical

education. This suggests that these two pivotal variables, digital competence and teachers' attitudes, significantly contribute to the variance in teachers' adoption of digital technology. This finding aligns with the idea that these attributes substantially influence technology utilization, as corroborated by Štemberger and Konrad (2021), who found that teachers' digital competency and positive attitudes toward technology use are positively associated with integrating digital technology in instruction.

The p-value, a key indicator in statistical analysis, holds immense importance, with a 0.000 (p<0.05) signifying a robust positive correlation between the dependent and independent variables. This statistical significance underscores the strong association between teachers' attitudes, digital competence, and technology usage in the physical education classroom. Moreover, this study reinforces Hero's (2020) research findings that educators are skilled or highly experienced with technology integration in education. According to him, teachers' technological integration practices are strongly connected with their level of preparedness and acceptability. He also suggests that schools provide teachers with more training and professional development to integrate technology into teaching, which might improve their teaching of technology integration. His study highlights the brief policy of the U. S. Department of Education that provides teacher assistance and training, demonstrating a positive connection between teachers' proficiency in online teaching and their readiness to utilize digital technology (Stokes-Beverley & Simoy, 2016).

Additionally, teachers' attitudes emerge as the more potent predictor (Beta = 0.443, p<0.05), underscoring their pivotal role in determining how digital technology is embraced as an educational tool in physical education. Educators who maintain positive views regarding technology are more likely to incorporate it into their teaching methods, ultimately enriching the educational experience for their students. The research by Ertmer and Ottenbreit-Leftwich (2013), which investigated the connection between teachers' attitudes and technology integration in the classroom, aligns with this idea. It demonstrates a favorable link between teachers' attitudes and the actual use of technology in their teaching.

Furthermore, digital competence is a significant predictor (Beta = 0.174, p<0.05), leading alongside teachers' attitudes. It underscores the importance of equipping teachers with essential digital skills and competencies. Successful technology integration in physical education is primarily attributed to teachers' adept use of digital tools and resources, which enhance student engagement and yield improved academic results. Voogt et al.'s (2015) study on the impact of professional development on teachers' digital skills affirms this, demonstrating

that programs tailored to enhance teachers' digital skills facilitate successful technology integration.

As digital technology permeates physical education instruction in an ever-evolving educational landscape, this research underscores the pivotal significance of digital competence and teachers' attitudes, as established through multiple regression analysis. The beta coefficients and statistically significant positive correlations accentuate the profound impact of these factors on the adoption of technology in teaching practices. Of particular note is the importance of teachers' attitudes, closely followed by digital competence, as determinants of how digital technology is embraced as an instructional strategy in physical education. It is increasingly evident that investments in training programs and support to enhance teachers' digital competence and foster positive attitudes are not merely justifiable but essential. As educational institutions navigate the digital frontier, such investments promise to unlock more effective and engaging physical education activities that harness digital technology for the mutual benefit of teachers and students.

CONCLUSION

The research reveals that physical education teachers demonstrate high levels of preparedness and positive attitudes toward using digital technology as an instructional tool. This positive mindset significantly influences their effective utilization of digital tools. The study emphasizes the interconnectedness of teachers' digital competence, attitude, and technology utilization, highlighting the importance of both digital competence and positive attitudes. This finding aligns with the established theoretical frameworks TAM and TSE, emphasizing the importance of a positive attitude for effective technology adoption in physical education. Notably, teachers' attitudes emerge as the most significant predictor of their use of digital technology, highlighting the need to prioritize both digital skills and positive attitudes. Despite the optimistic outlook, the study suggests ongoing support through training initiatives to enhance teachers' digital literacy and reinforce positive attitudes, serving as a roadmap for the continued integration of digital technology to improve the effectiveness and engagement in physical education.

TRANSLATIONAL RESEARCH

The findings of this study may be translated into a policy paper that spells out an organized, comprehensive training program covering diverse digital tools for teachers. These programs will foster a culture of technological integration and provide continuous support for teachers in the teaching and learning process.

LITERATURE CITED

Abella, J., & Rosa, E. D. (2023). Digital Literacy and Digital Competence of Selected Filipino Teachers: Basis for a Post-Pandemic Pedagogy.

Aslam, R., Khan, N., Asad, M. M., & Ahmed, U. (2021). Impact of Technological Pedagogical Content Knowledge on Teachers' Digital Proficiency at Classroom in Higher Education Institution of Pakistan. *Interactive Technology and Smart Education*, *18*(1), 119-130.

Bandura, A. (1986). Social Foundations of Thought and Action. *Englewood Cliffs, NJ*, *1986*(23-28).

Camacho-Sánchez, R., Rillo-Albert, A., & Lavega-Burgués, P. (2022). Gamified Digital Game-Based Learning as a Pedagogical Strategy: Student Academic Performance and Motivation. *Applied Sciences*, *12*(21), 11214.

Chua, K. (2021). PH remains top in social media, internet usage worldwide–report. *Rappler. https://bit.ly/47rqa4C*

Coughlin, S. S., Whitehead, M., Sheats, J. Q., Mastromonico, J., Hardy, D., & Smith, S. A. (2015). Smartphone applications for promoting healthy diet and nutrition: a literature review. *Jacobs journal of food and nutrition*, *2*(3), 021.

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). Effective Teacher Professional Development. *Learning Policy Institute.*

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.

Dias-Trindade, S., & Moreira, J. A. (2020). Assessment of High School Teachers on Their Digital Competences. *Magis. Revista Internacional de Investigación en Educación*, *13*, 1-21.

Ertmer, P. A., & Ottenbreit-Leftwich, A. (2013). Removing Obstacles to the Pedagogical Changes Required By Jonassen's Vision of Authentic Technology-Enabled Learning. *Computers & Education*, *64*, 175-182.

Espinosa, A. A., Gomez, M. A. C., Miranda, P. A., David, A. P., Abulon, E. L. R., Hermosisima, M. V. C., ... & Gonzales, N. S. (2023). Technology in education: a case study on the Philippines.

Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Gebhardt, E. (2014). *Preparing for life in a digital age: The IEA International Computer and Information Literacy Study international report* (p. 308). Springer Nature.

Galaraga, R. L., & Reynato Jr, C. A. (2022). Competence and attitude as predictors of teachers' readiness for digitized instruction. *Sapienza: International Journal of Interdisciplinary Studies*, *3*(7), 2-13.

Gamage, S. H., Ayres, J. R., & Behrend, M. B. (2022). A systematic review on trends in using Moodle for teaching and learning. *International Journal of STEM Education*, *9*(1), 1-24.

Ghavifekr, S., & Rosdy, W. A. W. (2015). Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools. *International journal of research in education and science*, *1*(2), 175-191.

Gil-Espinosa, F. J., Nielsen-Rodríguez, A., Romance, R., & Burgueño, R. (2022). Smartphone applications for physical activity promotion from physical education. *Education and Information Technologies*, *27*(8), 11759-11779.

Hanell, F. (2018). What is the 'problem'that digital competence in Swedish teacher education is meant to solve?. *Nordic Journal of digital literacy*, *13*(3), 137-151.

Harris, J. B., & Hofer, M. J. (2017). "TPACK Stories": Schools And School Districts Repurposing A Theoretical Construct For Technology-Related Professional Development. *Journal of Research on Technology in Education*, *49*(1-2), 1-15.

Hero, J. L. (2020). Teachers' Preparedness and Acceptance of Information and Communications Technology (ICT) Integration and Its Effect on their ICT Integration Practices. *Puissant*, *1*, 59-76.

Howard, S. K., Tondeur, J., Ma, J., & Yang, J. (2021). What to teach? Strategies for developing digital competency in preservice teacher training. *Computers & Education*, *165*, 104149.

Howe, S. (2023, April 4). Social media statistics in the Philippines [Updated 2023]. Meltwater. https://bit.ly/3NWtnC3

Jelena, M. (2023). Competences of Physical Education Teachers in Education Supported by Digital Technology. *International Journal of Cognitive Research in Science, Engineering and Education*, *11*(2), 331-341.

Kay, K., & Greenhill, V. (2010). Twenty-first century students need 21st century skills. In *Bringing schools into the 21st century* (pp. 41-65). Dordrecht: Springer Netherlands.

Martínez-Rico, G., Alberola-Albors, M., Pérez-Campos, C., & González-García, R. J. (2021). Physical Education Teachers' Perceived Digital Competences: Are They Prepared for the Challenges of the New Digital Age?. *Sustainability*, *14*(1), 321.

Osamende, O. P., & Frederick, A. B. (2016). Physical education teacher's attitudes and practice towards technology integration into teaching physical education at the senior high schools in Kumasi, Ghana. *International Journal of Multidisciplinary Research and Development*, *3*(4), 379-384.

Redecker, C., & Punie, Y. (2017). European Framework for the Digital Competence of Educators. *DigCompEdu. Publications Office of the Euro-pean Union.*

Singh, M. N. (2021). Inroad of digital technology in education: Age of digital classroom. *Higher Education for the Future*, *8*(1), 20-30.

Snetselaar, L. G., & Delahanty, L. M. (2017). Nutrition Intervention: Lessons from Clinical Trials. In *Nutrition in the Prevention and Treatment of Disease* (pp. 203-216). Academic Press.

Štemberger, T., & Konrad, S. Č. (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), 83-98.

Stokes-Beverley, C., & Simoy, I. (2016). Advancing Educational Technology in Teacher Preparation: Policy Brief. *Office of Educational Technology, US Department of Education*.

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in science education*, *48*, 1273-1296.

Tanucan, J. C. M., Hernani, M. R., & Diano, F. (2021). Filipino Physical Education Teachers' Technological Pedagogical Content Knowledge on Remote Digital Teaching. *International Journal of Information and Education Technology*, *11*(9), 416-423.

Taylor, M., Fudge, A., Mirriahi, N., & de Laat, M. (2021). Use of digital technology in education: Literature review.

Teo, T. (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers & Education*, *57*(4), 2432-2440.

Tondeur, J., Howard, S., Van Zanten, M., Gorissen, P., Van der Neut, I., Uerz, D., & Kral, M. (2023). The HeDiCom framework: Higher Education teachers' digital competencies for the future. *Educational technology research and development*, *71*(1), 33-53.

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and teacher education*, *17*(7), 783-805.

Viberg, O., Mavroudi, A., Khalil, M., & Bälter, O. (2020). Validating an instrument to measure teachers' preparedness to use digital technology in their teaching. *Nordic Journal of Digital Literacy*, *15*(1), 38-54.

Voogt, J., Fisser, P., Good, J., Mishra, P., & Yadav, A. (2015). Computational Thinking in Compulsory Education: Towards an Agenda for Research and Practice. *Education and information technologies*, *20*, 715-728.

Wu, H. K., Lee, S. W. Y., Chang, H. Y., & Liang, J. C. (2013). Current status, opportunities and challenges of augmented reality in education. *Computers & education*, *62*, 41-49.