

# Digital Literacy, Access to Resources, and Proficiency: A Convergent Mixed-Methods in Addressing the Digital Divide Among Physical Education Teachers

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**Abstract.** This study examines the relationship between digital literacy, access to resources, and proficiency, challenges, experiences, and coping mechanisms of Physical Education teachers in public secondary school in Los Baños District. This is to understand how teachers' digital literacy, access to resources, and experiences affect their ability to integrate technology into teaching. A convergent mixed-methods was used to gather both quantitative and qualitative data. Survey questionnaires measured the level of digital literacy, access to resources, and proficiency. Interviews were conducted to understand their experiences, challenges, and coping mechanisms using technology in teaching. The findings reveal that teachers have high level of digital literacy in basic computer skills and familiarity with online platforms. However, some experience difficulties integrating technology in P.E. because of limited resources, unstable internet connection, and insufficient training and institutional support. Access to devices and learning materials and access to resources such as internet connection and digital tools play an important role for a better teaching. The findings showed that there is a significant relationship between digital literacy, access to resources, and proficiency in using technology in teaching. Therefore, the results reveal that the hypothesis is rejected. The study shows that teachers are active in improving their digital skills through self-learning, practice, and collaboration with colleagues. These findings highlight the importance of continuous learning and proper training to help teachers effectively integrate technology in P.E. classes. Teachers with better digital skills and access to resources are confident and effective in integrating technology into teaching. Teachers also demonstrated coping strategies such as self-learning and collaboration with colleagues. These helped them deliver lessons effectively even with limited technological and institutional support. This study highlights the importance of continuous professional development, improve digital resources accessibility, and institutional support to strengthen teachers' digital skills.

**Keywords:** Digital Literacy, Resource Accessibility, Teachers' Proficiency, Digital Divide, Technology Integration.

## I. INTRODUCTION

Technology plays a significant role in education most especially today. Teachers now use digital tools like Microsoft Office and Google Workspace in lesson planning, and different online platforms to teach. These tools can make learning more interesting and easier to understand because students today are digital learners. However, not all teachers are confident in using technology, some can use it well in class, while others find it hard to integrate it. This difference is often called the digital

divide. It really affects the efficiency of teachers who are expected to know how to use digital tools.

Around the world, the digital gap between teachers is still a problem in education, especially in developing countries like Philippines because of different circumstances. Teachers are now expected to use online platforms like Microsoft Teams and Google Classroom, social media applications like Messenger and WhatsApp, and digital materials like Department of Education Open Educational Resources in class. Many of them struggle because they are not provided with proper training, insufficient resources, or they lack basic skills in using technology. In the Philippines, this problem became clearer during the pandemic when schools moved to online and blended class. Teachers who were not skilled in using technology had a harder time, which led to unequal learning experiences for students, this was evident by the study of Robosa et. al (2021). The Experiences and Challenges Faced of the Public School Teachers Amidst the COVID-19 Pandemic: A Phenomenological Study in the Philippines, they stated that teachers hardly perform specific tasks virtually, provide an effective learning environment, and communicate with students. In secondary public schools, the situation is more serious. Many teachers do not have stable internet, updated devices, or enough training in digital learning.

Physical education teachers face more challenges because their subject focuses more on movement, practice, and physically active participation. These are harder to teach online even with the use of different online platforms. Teaching P.E. online requires strong digital skills because without these, teachers may find it difficult to create useful and effective activities, check students' performance, and keep students interested in online or blended classes.

This issue shows a clear gap between what the education system expects and what P.E. teachers can do. While the Department of Education stresses the use of technology in teaching, not all teachers are provided with equal opportunities to improve their digital skills because they either lack in seminars and training, or their resources is not enough. Because of this, some teachers are left behind, and students do not receive the quality of learning they deserve. These situations are the reason for this study.

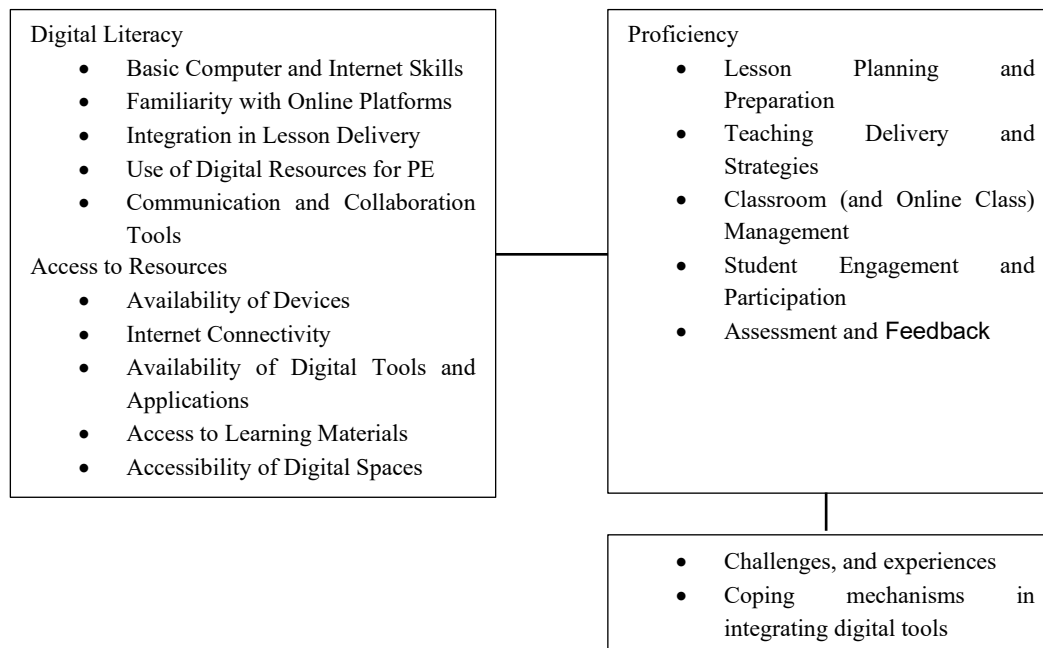


Figure 1. Conceptual Framework

Source: Created by authors using Microsoft word

This study explored the relationship between digital literacy, access to resources, and proficiency, and challenges, experiences, and coping mechanisms in integrating digital tools because these factors are connected in real life situations of P.E. teachers. Having strong digital skills is important, but without appropriate tools and devices, reliable internet connections, and enough support from the institution, many teachers may struggle to apply them effectively. By examining these relationships, the study aimed to determine if digital literacy and access to resources are linked to higher teaching proficiency, which may help schools and institutions to improve support and training programs for teachers that can be helpful to improve teaching and learning experiences.

*Objectives of the Study*

The researchers seek to answer the following objectives: determine the digital literacy, access to resources and proficiency of public secondary teachers, identify the challenges, experiences, and coping mechanisms in integrating digital tools into teaching. With these, the researcher can propose solutions that can be useful to improve teachers’ digital skills.

II. METHODOLOGY

This study used a convergent mixed-methods research design that combined quantitative and qualitative approaches to better understand digital skills, available resources, and proficiency among P.E. teachers and challenges, experiences, and coping mechanisms in integrating digital tools in P.E. Using these allowed the study to look at the issue in complete and meaningful way in using digital tools into P.E. lessons.

In addition, the correlational aspect of the study explored the relationship between digital literacy, access to resources,

and teachers’ proficiency. Surveys were used to gather numerical data about teachers’ level of proficiency. In addition, an in-depth interview was conducted to learn about teachers’ challenges and experiences on using digital tools in teaching P.E. subject in today’s learning environment and how they cope with difficulties they encounter in integrating digital tools into their teaching.

The respondents of this study were teachers from public secondary schools in Los Baños, Laguna who have experience using digital platforms in their teaching. A purposive sampling method was used to choose 41 teachers for survey and 8 teachers for interview. The selection was done carefully to include teachers of different ages, gender, job positions, years of teaching experience, and school assignments.

This study used two tools to collect data. These are surveys and interview guide. For survey, a Likert scale was used to assess the level of digital literacy and access to resources and proficiency among teachers. It included items focusing on basic computer and internet skills, familiarity with online platforms, integration in lesson delivery, use of digital resources, communication and collaboration tools. It also focuses on availability of devices, internet connectivity, availability of digital tools and applications, access to learning materials, and accessibility of digital spaces. And lastly, lesson planning and preparation, teaching delivery and strategies, classroom (and online class) management, student engagement and participation, assessment and feedback.

For the interview process, a thematic analysis was used. Selected teachers who agreed to participate, took part in a guided conversation. This helped gather deeper information about their experiences and views on using digital platforms in teaching. It focused on challenges, experiences, and their coping mechanism in integrating digital tools.

The data gathered in this study were analyzed using appropriate statistical tools to address the research objectives. To determine the level of digital literacy, access to available resources, and educator proficiency of Physical Education teachers, the weighted mean and standard deviation were utilized. These statistical measures were used to describe the average responses of the participants and the variability of their responses across the indicators.

Additionally, to determine the significant relationship between digital literacy and educator proficiency, as well as between access to available resources and educator proficiency, the Pearson Correlation Coefficient was employed. This statistical test was used to examine the strength and direction of the relationship between the variables included in the study. Meanwhile, the qualitative data were analyzed through Thematic Analysis to identify and report patterns within the qualitative data.

### III. RESULTS AND DISCUSSION

This study shows important factors that affect the digital literacy, access to resources, and proficiency of Physical Education teachers. It also looks at the challenges and experiences and how they cope with the digital divide.

Table 1. Level of Digital Literacy of Physical Education Teachers in terms of Basic Computer and Internet Skills

Item	Mean	SD
I can perform basic computer operations such as creating, saving, and retrieving files.	4.88	0.40
I can use word processing, spreadsheet, and presentation software for school-related tasks.	4.80	0.46
I can connect to and navigate the internet without difficulty.	4.66	0.66
I can install and update applications or software when needed.	4.51	0.75
I can troubleshoot simple computer or internet connectivity issues.	4.29	0.78
<b>Composite Mean</b>	<b>4.63</b>	

The findings of basic computer and internet skills that teachers have positive results, with a composite mean score of 4.63 indicating very high levels of basic computer and internet skills. The highest-scoring items, such as *"I can perform basic computer operations such as creating, saving, and retrieving files."* (mean: 4.88). *"I can use word processing, spreadsheet, and presentation software for school-related tasks."* (mean: 4.80), indicating that teachers are confident in basic computer tasks. Items such as *"I can connect to and navigate the internet without difficulty."* yield consistent responses. (mean: 4.66, SD: 0.66), and *"I can install and update applications or software when needed."* (mean: 4.51, SD: 0.75), indicating that they can navigate and install different applications needed for their teaching. Item such as *"I can troubleshoot simple computer or internet connectivity issues."* (mean: 4.29, SD: 0.78), indicating that most teachers can solve basic technical issues, but this is where they are less confident compared to others.

The results of familiarity with online platforms have positive result, with a composite mean of 4.46, indicating that they can use different online tools for teaching. The highest-scoring items, such as *"I can become familiar with using online platforms like Google Classroom, Zoom, and Microsoft Teams*

*for teaching."* (mean: 4.63). *"I can upload, share, and organize learning materials through online platforms."* (mean: 4.61). *"I can create and manage online classes in a learning management system."* (mean: 4.51), indicating that teachers can handle online class tasks. Items such as *"I can monitor and track student participation using online platforms."* yield consistent responses. (mean: 4.29, SD: 0.84), and *"I can be confident in using multiple online platforms for different teaching purposes."* (mean: 4.24, SD: 0.80), indicating that while teachers are generally skilled, some may still to practice in tracking students and using different platforms.

Table 2. Level of Digital Literacy of Physical Education Teachers in terms of Familiarity with Online Platforms

Item	Mean	SD
I can become familiar with using online platforms like Google Classroom, Zoom, and Microsoft Teams for teaching.	4.63	0.73
I can create and manage online classes in a learning management system.	4.51	0.71
I can upload, share, and organize learning materials through online platforms.	4.61	0.77
I can monitor and track student participation using online platforms.	4.29	0.84
I can be confident in using multiple online platforms for different teaching purposes.	4.24	0.80
<b>Composite Mean</b>	<b>4.46</b>	

Table 3. Level of Digital Literacy of Physical Education Teachers in terms of Integration in Lesson Delivery

Item	Mean	SD
I can integrate digital tools in planning my PE lessons.	4.44	0.63
I can use technology to demonstrate PE skills like showing videos or animations.	4.59	0.63
I can provide assessments and feedback to students through digital platforms.	4.20	0.81
I can design activities that require students to use technology to support for their PE learning.	4.32	0.72
I believe digital tools enhance my effectiveness in teaching PE.	4.44	0.71
<b>Composite Mean</b>	<b>4.40</b>	

The findings of integration in lesson delivery have positive result, with a composite mean of 4.40., indicating that most teachers can use digital tools in their teaching. The highest-rated items, such as *"I can use technology to demonstrate PE skills like showing videos or animations."* (mean: 4.59), indicating that teachers are confident in using technology to explain lessons clearly. Items such as *"I can integrate digital tools in planning my PE lessons."* and *"I believe digital tools enhance my effectiveness in teaching PE."* (mean: 4.44), indicating that teachers see the value of technology in improving their teaching. Item such as *"I can design activities that require students to use technology to support for their PE learning."* got a response of (mean: 4.32, SD: 0.72), indicating that teachers can involve students in using technology. Item such as *"I can provide assessments and feedback to students through digital platforms."* (mean: 4.20, SD: 0.81), indicating that while teachers are generally skilled in using technology, providing digital assessments and feedback can still be improved.

Table 4. Level of Digital Literacy of Physical Education Teachers in terms of Use of Digital Resources for PE

Item	Mean	SD
I can use educational videos or tutorials as part of my PE lessons.	4.68	0.57
I can incorporate mobile apps or online tools to support PE instruction.	4.12	0.81
I can utilize digital modules or e-books in teaching Physical Education.	3.80	0.87
I can use technology such as wearables or online trackers for monitoring student performance.	3.56	0.95
I can rely on digital assessment tools to evaluate student progress in PE.	3.71	0.90
<b>Composite Mean</b>	<b>3.98</b>	

The findings of using digital resources is high, with a composite mean of 3.98, indicating that teachers can use different digital tools in their PE classes. The highest-rated items, such as “I can use educational videos or tutorials as part of my PE lessons.” (mean: 4.68), and “I can incorporate mobile apps or online tools to support PE instruction.” (mean: 4.12) indicating that many teachers can use apps and online platforms in their teaching. Items such as “I can utilize digital modules or e-books in teaching Physical Education.” (mean: 3.80), and “I can rely on digital assessment tools to evaluate student progress in PE.” (mean: 3.71), indicating that teachers use these resources less often. Item such as “I can use technology such as wearables or online trackers for monitoring student performance.” (mean: 3.56, SD: 0.95), indicating that fewer teachers are familiar with these tools.

Table 5. Level of Digital Literacy of Physical Education Teachers in terms of Communication and Collaboration Tools

Item	Mean	SD
I can use email to communicate effectively with students and colleagues.	3.61	1.14
I can use chat applications like Messenger, Viber, and WhatsApp to provide updates and reminders.	4.49	0.81
I can participate in online forums or groups to exchange ideas about teaching PE.	3.71	1.08
I can use collaborative platforms like Google Docs and Microsoft Teams to work with colleagues on teaching tasks.	3.93	0.93
I believe digital communication tools improve collaboration in my teaching practice.	4.44	0.81
<b>Composite Mean</b>	<b>4.03</b>	

The findings of *communication* and collaboration tools have positive result, with a composite mean of 4.03. This means that they can use digital tools when communicating. The highest-rated items, such as “I can use chat applications like Messenger, Viber, and WhatsApp to provide updates and reminders.” (mean: 4.49), and “I believe digital communication tools improve collaboration in my teaching practice.” (mean: 4.44) indicating that they are confident in using different platforms to communicate. Items such as “I can use collaborative platforms like Google Docs and Microsoft Teams to work with colleagues on teaching tasks.” (mean: 3.93), and “I can participate in online forums or groups to exchange ideas about teaching PE.” (mean: 3.71), indicating that teachers can work with others using online tools. Item such as “I can use email to communicate effectively with students and colleagues.” (mean: 3.61, SD: 1.14), indicating that this is used lesser than other communication tools.

Table 6. Level of Access to Resources Available of Physical Education Teachers in terms of Availability of Devices

Item	Mean	SD
I have access to a personal laptop or desktop computer for teaching-related tasks.	4.80	0.46
I have access to a smartphone or tablet that I regularly use for academic purposes.	4.61	0.70
I use devices that are updated and functional enough to meet my teaching needs.	4.63	0.66
I have sufficient access to school-provided devices for instructional use.	4.20	1.12
I have number of devices available to me that is adequate to support both teaching and student engagement.	4.44	0.92
<b>Composite Mean</b>	<b>4.54</b>	

The findings on the level of access to resources in terms of availability of devices have positive result, with a composite mean of 4.54, indicating that teachers have good access to digital devices needed for teaching. The highest-scoring item, such as “I have access to a personal laptop or desktop computer for teaching-related tasks.” (mean: 4.80), indicating that most teachers have their own computers for work. Items such as “I use devices that are updated and functional enough to meet my teaching needs.” yield consistent responses. (mean: 4.63), and “I have access to a smartphone or tablet that I regularly use for academic purposes.” (mean: 4.61), indicating that teachers commonly use reliable and modern gadgets for instruction. Item such as “I have number of devices available to me that is adequate to support both teaching and student engagement.” (mean: 4.44), indicating that devices are generally enough but may still be limited for some teachers. Last item “I have sufficient access to school-provided devices for instructional use.” (mean: 4.20, SD: 1.12), indicating that access to school-issued equipment is less consistent compared to personal devices.

Table 7. Level of Access to Resources Available of Physical Education Teachers in terms of Internet Connectivity

Item	Mean	SD
I have reliable internet access at home to prepare and deliver lessons.	4.68	0.52
The internet connection in my school is sufficient for teaching and administrative tasks.	3.66	1.26
Slow or unstable internet frequently disrupts my teaching-related activities.	4.10	1.07
I can easily use video conferencing platforms like Microsoft Teams, Zoom, and Google Meet without major connectivity issues.	4.02	1.08
My current internet access allows me to explore and integrate online resources in my teaching.	4.44	0.81
<b>Composite Mean</b>	<b>4.18</b>	

The findings on the level of access to resources in terms of internet connectivity show generally positive result, with a composite mean of 4.18, indicating that teachers can access and use internet for teaching and school-related tasks. The highest-scoring items, such as “I have reliable internet access at home to prepare and deliver lessons.” (mean: 4.68), and “My current internet access allows me to explore and integrate online resources in my teaching.” (mean: 4.44) indicating that most teachers can work at home without major internet problems. Items such as “Slow or unstable internet frequently disrupts my teaching-related activities.” yield consistent responses. (mean: 4.10), and “I can easily use video conferencing platforms like

Microsoft Teams, Zoom, and Google Meet without major connectivity issues.” (mean: 4.02), indicating that teachers can use online platforms without issue but having so can interrupts their class. Item such as “The internet connection in my school is sufficient for teaching and administrative tasks.” (mean: 3.66, SD: 1.26), indicating that internet service in school is not always reliable.

Table 8. Level of Access to Resources Available of Physical Education Teachers in terms of Availability of Digital Tools and Applications

Item	Mean	SD
I have access to productivity tools like Microsoft Office and Google Workspace that are necessary for teaching.	4.44	0.63
I can access educational platforms like DepEd LMS, Google Classroom whenever needed.	4.17	0.83
I am provided with digital assessment tools like quiz apps and online test creators for teaching.	3.76	0.94
I am in school that provides me with the necessary licenses or subscriptions for teaching-related applications.	3.46	1.23
I can easily access applications that support Physical Education instruction like fitness apps and video analysis tools.	3.98	0.91
<b>Composite Mean</b>	<b>3.96</b>	

The findings of availability of digital tools and applications show positive result, with a composite mean of 3.96, indicating that teachers often have access to digital tools that support their teaching. The highest-scoring items, such as “I have access to productivity tools like Microsoft Office and Google Workspace that are necessary for teaching.” (mean: 4.44), and “I can access educational platforms like DepEd LMS, Google Classroom whenever needed.” (mean: 4.17), indicating that many teachers can use online platforms when needed. Items such as “I can easily access applications that support Physical Education instruction like fitness apps and video analysis tools.” yield consistent responses. (mean: 3.98), and “I am provided with digital assessment tools like quiz apps and online test creators for teaching.” (mean: 3.76), indicating that not all teachers regularly use these tools. Item such as “I am in school that provides me with the necessary licenses or subscriptions for teaching-related applications.” (mean: 3.46, SD: 1.23), indicating that some schools may still lack full support in providing licensed digital tools.

Table 9. Level of Access to Resources Available of Physical Education Teachers in terms of Access to Learning Materials

Item	Mean	SD
I have access to updated digital teaching and learning resources relevant to Physical Education.	4.15	0.82
I have online repositories and open-access resources are readily available for my instructional needs.	4.00	1.00
I can easily obtain DepEd-provided electronic learning modules and references.	4.02	0.96
I have access to multimedia learning resources like videos and interactive content to support my lessons.	4.34	0.69
I have digital learning materials available to me that are sufficient to support my instructional objectives.	4.27	0.74
<b>Composite Mean</b>	<b>4.16</b>	

The findings of access to learning materials show positive result, with a composite mean of 3.96, indicating that teachers often have access to learning materials. The highest-scoring items, such as “I have access to multimedia learning resources

like videos and interactive content to support my lessons.” (mean: 4.34), and “I have digital learning materials available to me that are sufficient to support my instructional objectives.” (mean: 4.27), indicating that most teachers feel their available materials are enough for their teaching needs. Items such as “I have access to updated digital teaching and learning resources relevant to Physical Education.” yield consistent responses. (mean: 4.15), “I can easily obtain DepEd-provided electronic learning modules and references.” (mean: 4.02), and “I have online repositories and open-access resources are readily available for my instructional needs.” (mean: 4.00), indicating that teachers can access different learning materials, both from DepEd and online sources, when needed.

Table 10. Level of Access to Resources Available of Physical Education Teachers in terms of Accessibility of Digital Spaces

Item	Mean	SD
I have access to online platforms where I can collaborate with colleagues.	4.37	0.83
I participate in webinars, online trainings, or professional learning communities with ease.	4.54	0.64
I have access to secure school-provided digital accounts like official email and LMS accounts.	4.10	1.00
I join and use online platforms designed for student-teacher communication.	4.34	0.79
I have digital spaces that are user-friendly and accessible whenever I need them.	4.34	0.82
<b>Composite Mean</b>	<b>4.34</b>	

The findings of accessibility of digital spaces show positive result, with a composite mean of 4.34, indicating that they can easily use online platforms for their work. The highest-scoring item, such as “I participate in webinars, online trainings, or professional learning communities with ease.” (mean: 4.54), indicating that teachers are active in online learning and professional development. Items such as “I have access to online platforms where I can collaborate with colleagues.” yield consistent responses. (mean: 4.37), and “I join and use online platforms designed for student-teacher communication.” (mean: 4.34), meaning, they can communicate well using digital tools. Items such as “I have digital spaces that are user-friendly and accessible whenever I need them.” (mean: 4.34), and “I have access to secure school-provided digital accounts like official email and LMS accounts.” (mean: 4.10), indicating that while access is still available, it may not be as consistent compared to other areas.

The findings of lesson planning and preparation show positive result, with a composite mean of 4.73, indicating that teachers are skilled in using digital tools for their preparation. The highest-scoring items, such as “I use digital tools like Microsoft Word, PowerPoint, and Google Docs to prepare lesson plans for my Physical Education classes.” (mean: 4.85), and “I integrate online resources like videos, articles, interactive content into my lesson preparation to enhance learning.” (mean: 4.83), indicating that teachers can make their lessons more engaging through digital content. Items such as “I design lesson plans that align with both curriculum standards and the use of digital platforms.” yield consistent responses. (mean: 4.71), and “I am confident in modifying my lesson plans for both face-to-face and online Physical Education classes.”

(mean: 4.63), indicating that they can be flexible in different teaching setups. Item such as “I allocate sufficient time to prepare digitally-supported instructional materials.” (mean: 4.61), indicating that they put effort in improving lesson quality.

Table 11. Level of Proficiency of Physical Education Teachers in terms of Lesson Planning and Preparation

Item	Mean	SD
I use digital tools like Microsoft Word, PowerPoint, and Google Docs to prepare lesson plans for my Physical Education classes.	4.85	0.42
I integrate online resources like videos, articles, interactive content into my lesson preparation to enhance learning.	4.83	0.38
I design lesson plans that align with both curriculum standards and the use of digital platforms.	4.71	0.60
I am confident in modifying my lesson plans for both face-to-face and online Physical Education classes.	4.63	0.54
I allocate sufficient time to prepare digitally-supported instructional materials.	4.61	0.54
<b>Composite Mean</b>	<b>4.73</b>	

Table 12. Level of Proficiency of Physical Education Teachers in terms of Teaching Delivery and Strategies

Item	Mean	SD
I use digital media like presentations, simulations, and apps to deliver Physical Education concepts effectively.	4.49	0.78
I can adjust my teaching strategies to incorporate both traditional methods and digital tools.	4.56	0.67
I am confident in using online platforms like Google Classroom, Zoom, and Microsoft Teams for delivering PE instruction.	4.22	0.91
I can utilize technology to demonstrate sports skills, drills, or fitness routines when necessary.	4.32	0.76
I can effectively manage a balance between physical activity and digital instruction in PE classes.	4.39	0.70
<b>Composite Mean</b>	<b>4.40</b>	

The findings of teaching delivery and strategies show positive result, with a composite mean of 4.40, indicating that teachers are confident in using both traditional and digital approaches in teaching. The highest-scoring items, such as “I can adjust my teaching strategies to incorporate both traditional methods and digital tools.” (mean: 4.56), and “I use digital media like presentations, simulations, and apps to deliver Physical Education concepts effectively.” (mean: 4.49), indicating that teachers can flexibly change their approach depending on the lesson needs. Items such as “I can effectively manage a balance between physical activity and digital instruction in PE classes.” yield consistent responses. (mean: 4.39), and “I can utilize technology to demonstrate sports skills, drills, or fitness routines when necessary.” (mean: 4.32), indicating that they can combine movement-based instruction with technology use. Item such as “I am confident in using online platforms like Google Classroom, Zoom, and Microsoft Teams for delivering PE instruction.” (mean: 4.22), indicating that some teachers may still be adjusting to fully using these platforms.

The findings of proficiency in terms of classroom (and online class) management show a generally positive result, with a composite mean of 4.10, indicating that teachers can manage class effectively with the use of technology. The highest-scoring items, such as “I establish clear rules for technology

use during PE classes.” (mean: 4.34), and “I can manage students’ behavior effectively during online Physical Education classes.” (mean: 4.22), and “I use strategies to maintain student discipline and focus in digital or hybrid learning environments.” (mean: 4.39) indicating that teachers can set guidelines for students even on online setup. Item such as “I can address technical issues that may disrupt face-to-face or online class sessions.” (mean: 4.05), indicating that they can address technical problems that may interrupt classes. Item such as “I use digital tools like attendance trackers, learning management systems to monitor student participation.” (mean: 3.73, SD: 0.95), indicating that they sometimes use these tools to monitor student participation.

Table 13. Level of Proficiency of Physical Education Teachers in terms of Classroom (and Online Class) Management

Item	Mean	SD
I can manage students’ behavior effectively during online Physical Education classes.	4.22	0.72
I use digital tools like attendance trackers, learning management systems to monitor student participation.	3.73	0.95
I can address technical issues that may disrupt face-to-face or online class sessions.	4.05	0.97
I use strategies to maintain student discipline and focus in digital or hybrid learning environments.	4.15	0.88
I establish clear rules for technology use during PE classes.	4.34	0.76
<b>Composite Mean</b>	<b>4.10</b>	

Table 14. Level of Proficiency of Physical Education Teachers in terms of Student Engagement and Participation

Item	Mean	SD
I use online activities like quizzes, polls, interactive apps to increase student participation in PE.	3.83	1.09
I encourage students to use digital tools to track their own fitness or performance progress.	4.00	0.95
I design PE activities that keep students engaged both in physical and digital learning spaces.	4.17	0.86
I adapt my teaching approaches to maintain student motivation in online and face-to-face settings.	4.29	0.84
I believe digital platforms help me provide more opportunities for active student participation.	4.39	0.83
<b>Composite Mean</b>	<b>4.14</b>	

The findings of student engagement and participation show positive result, with a composite mean of 4.14, indicating that teachers use different ways to keep students involved in learning activities. The highest-scoring items, such as “I believe digital platforms help me provide more opportunities for active student participation.” (mean: 4.39), “I adapt my teaching approaches to maintain student motivation in online and face-to-face settings.” (mean: 4.29), and “I design PE activities that keep students engaged both in physical and digital learning spaces.” (mean: 4.17) indicating that teachers adjust their strategies to keep students interested in different learning setups. Item such as “I encourage students to use digital tools to track their own fitness or performance progress.” (mean: 4.00), indicating that they encourage students in using technology for self-monitoring. Item such as “I use online activities like quizzes, polls, interactive apps to increase student participation in PE.” (mean: 3.83, SD: 1.09), indicating that they sometimes use online tools to engage students in assessments.

The findings of assessment and feedback show positive result, with a composite mean of 4.18, indicating that teachers use digital tools in assessing and giving feedback to students. The highest-scoring items, such as “I keep digital records of students’ progress for easier monitoring and reporting.” (mean: 4.44), and “I find technology useful in giving personalized feedback to students in PE.” (mean: 4.37), indicating that teachers can organize student data, and give feedback using technology. Items such as “I design assessments that measure both physical performance and digital literacy skills.” (mean: 4.10), and “I use digital platforms like Google Forms, Kahoot, LMS to administer assessments in PE.” (mean: 3.98) indicating that teachers can assess with technology. Item such as “I provide timely feedback to students using digital tools like chat, email, online comments.” (mean: 4:00),

indicating that teachers regularly communicate feedback using technology.

Table 15. Level of Proficiency of Physical Education Teachers in terms of Assessment and Feedback

Item	Mean	SD
I use digital platforms like Google Forms, Kahoot, LMS to administer assessments in PE.	3.98	1.04
I provide timely feedback to students using digital tools like chat, email, online comments.	4.00	1.10
I design assessments that measure both physical performance and digital literacy skills.	4.10	0.97
I keep digital records of students’ progress for easier monitoring and reporting.	4.44	0.81
I find technology useful in giving personalized feedback to students in PE.	4.37	1.04
<b>Composite Mean</b>	<b>4.18</b>	

Table 16. Significant Relationship between the Digital Literacy and Educator Proficiency

Digital Literacy		Teachers Proficiency				
		Lesson Planning and Preparation	Teaching Delivery and Strategies	Classroom (and Online Class) Management	Student Engagement and Participation	Assessment and Feedback
Basic Computer and Internet skills	Pearson Correlation	.554**	.608**	.575**	.609**	.569**
	Sig. (2-tailed)	<0.001	<0.001	<0.001	<0.001	<0.001
	N	41	41	41	41	41
Familiarity with Online Platforms	Pearson Correlation	.567**	.742**	.699**	.733**	.696**
	Sig. (2-tailed)	<0.001	<0.001	<0.001	<0.001	<0.001
	N	41	41	41	41	41
Integration in Lesson Delivery	Pearson Correlation	.722**	.624**	.568**	.576**	.545**
	Sig. (2-tailed)	<0.001	<0.001	<0.001	<0.001	<0.001
	N	41	41	41	41	41
Use of Digital Resources for PE	Pearson Correlation	.464**	.741**	.750**	.777**	.685**
	Sig. (2-tailed)	0.002	<0.001	<0.001	<0.001	<0.001
	N	41	41	41	41	41
Communication and Collaboration Tools	Pearson Correlation	.314*	.701**	.709**	.700**	.625**
	Sig. (2-tailed)	0.046	<0.001	<0.001	<0.001	<0.001
	N	41	41	41	41	41

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

The data reveal that most aspects of digital literacy are significantly positively related to teachers’ proficiency. Basic computer and internet skills show significant correlations with lesson planning ( $r = 0.554$ ,  $p < 0.001$ ), teaching delivery ( $r = 0.608$ ,  $p < 0.001$ ), classroom management ( $r = 0.575$ ,  $p < 0.001$ ), student engagement ( $r = 0.609$ ,  $p < 0.001$ ), and assessment ( $r = 0.569$ ,  $p < 0.001$ ). Familiarity with online platforms is strongly related to all proficiency areas, with particularly high correlations for teaching delivery ( $r = 0.742$ ,  $p < 0.001$ ) and student engagement ( $r = 0.733$ ,  $p < 0.001$ ). Integration of digital tools in lesson delivery also shows significant positive relationships with all measured areas ( $r = 0.545$  to  $0.722$ ,  $p < 0.001$ ). Similarly, the use of digital resources for physical education is significantly associated with classroom management ( $r = 0.750$ ,  $p < 0.001$ ) and student engagement ( $r = 0.777$ ,  $p < 0.001$ ), among other components. Communication and collaboration tools demonstrate significant positive correlations across most proficiency areas, with the highest correlations for classroom management ( $r = 0.709$ ,  $p <$

$0.001$ ) and teaching delivery ( $r = 0.701$ ,  $p < 0.001$ ).The only area with relatively lower significance is the relationship between communication and collaboration tools and lesson planning ( $r = 0.314$ ,  $p = 0.046$ ). While still statistically significant, this indicates a weaker association compared to other digital literacy components, implying that such tools may play a smaller role in planning lessons than in other aspects of teaching proficiency.

The results indicate that several aspects of access to resources are significantly positively related to educator proficiency. Internet connectivity shows strong significant correlations with all areas of proficiency, including lesson planning ( $r = 0.633$ ,  $p < 0.001$ ), teaching delivery ( $r = 0.712$ ,  $p < 0.001$ ), classroom management ( $r = 0.558$ ,  $p < 0.001$ ), student engagement ( $r = 0.703$ ,  $p < 0.001$ ), and assessment ( $r = 0.731$ ,  $p < 0.001$ ). Similarly, availability of digital tools and applications is significantly associated with all proficiency areas, with correlations ranging from  $r = 0.339$ ,  $p = 0.030$  for lesson planning to  $r = 0.652$ ,  $p < 0.001$  for student engagement.

Accessibility of digital spaces also shows significant positive relationships with lesson planning ( $r = 0.338, p = 0.031$ ), teaching delivery ( $r = 0.724, p < 0.001$ ), classroom management ( $r = 0.526, p < 0.001$ ), student engagement ( $r = 0.666, p < 0.001$ ), and assessment ( $r = 0.645, p < 0.001$ ). Likewise, some resource factors show non-significant relationships with certain proficiency areas. For instance, availability of devices is not

significantly correlated with lesson planning ( $r = 0.197, p = 0.217$ ), and access to learning materials is not significantly related to lesson planning ( $r = 0.26, p = 0.101$ ). These findings indicate that while access to resources generally supports teaching effectiveness, certain resources may have less impact on specific areas like lesson planning.

Table 17. Significant Relationship between Access to Resources and Proficiency

Access to Resources		Teachers' Proficiency				
		Lesson Planning and Preparation	Teaching Delivery and Strategies	Classroom (and Online Class) Management	Student Engagement and Participation	Assessment and Feedback
Availability of Devices	Pearson Correlation	0.197	.554**	.647**	.641**	.510**
	Sig. (2-tailed)	0.217	<0.001	<0.001	<0.001	0.001
	N	41	41	41	41	41
Internet Connectivity	Pearson Correlation	.633**	.712**	.558**	.703**	.731**
	Sig. (2-tailed)	<0.001	<0.001	<0.001	<0.001	<0.001
	N	41	41	41	41	41
Availability of Digital Tools and Applications	Pearson Correlation	.339*	.644**	.587**	.652**	.577**
	Sig. (2-tailed)	0.030	<0.001	<0.001	<0.001	<0.001
	N	41	41	41	41	41
Access to Learning Materials	Pearson Correlation	0.26	.709**	.698**	.694**	.663**
	Sig. (2-tailed)	0.101	<0.001	<0.001	<0.001	<0.001
	N	41	41	41	41	41
Accessibility of Digital Spaces	Pearson Correlation	.338*	.724**	.526**	.666**	.645**
	Sig. (2-tailed)	0.031	<0.001	<0.001	<0.001	<0.001
	N	41	41	41	41	41

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 18. Challenges Experienced by Physical Education Teachers in the Integration of Digital Tools into Lesson Planning

Major Theme	Sub-Themes	Description	Relevant Statement
Limited Digital Resources and Infrastructure Constraints Limited Digital Literacy and Technical Competence	Inadequate Digital Tools and Devices	Insufficient availability of digital tools and equipment needed for teaching. Teachers face limitations in accessing materials to integrate technology into their lessons.	"The availability of materials for physical education lesson still lacks, the only technological integration that the school has is television which is not enough for the integration of the digital tools or the teaching of digital tools to students." (P.E. Teacher2)
	Poor Internet Connectivity	Weak or unstable internet access that makes downloading or presenting harder for teachers. Limited or unstable internet connection interrupts lesson flow.	"I was having a hard time using digital tools when there are internet connection issues or when I clicked something that wasn't supposed to be clicked. It became stressful and it disrupts the momentum of the class." (P.E. Teacher3)
	Limited Access to Online Platforms and Resources	This is due to lack of institutional support that limits the teachers' capability to use online tools that can improve the instruction.	"Because we are having limited access to digital world, those online platforms, we need to shift to manual demonstration" (P.E. Teacher8)
	Equipment and System Problems	Technical issues that most teachers encountered when using digital tools. Short delays because of system problems can seriously affect the activities and timeline planned during the class. Repeated technical issues may lead to technology being burden than being helpful.	"Sometimes I experienced problems such as technicality problems, when the laptop cannot connect to the television even if you already used HDMI or anycast, and it still doesn't work. That is one of the main challenges for me, about the equipment." (P.E. Teacher5)
Limited Digital Literacy and Technical Competence	Lack of Familiarity with Digital Tools	Teachers' limited experience with different digital applications and platforms. Lack of familiarity with digital tools reduces the effectiveness of digital integration in class.	"I 'am not yet well-equipped especially on new applications, and the so-called technology-based digital tools". P.E. Teacher1)
			"The main challenge is I am still unfamiliar in using digital tools because I am used to traditional teaching like demonstrations, drills, and direct instructions." (PE. Teacher3)

Difficulty in Operating and Troubleshooting Technology	The challenges that teachers face in handling technical issues of digital tools. Without strong troubleshooting skills, time consumed is wasted.	<i>“Sometimes I get confused on how to open and operate applications, especially when the application is new to me. It takes time to set up, operate, fix and troubleshoot. This makes the students lose their focus, and the time is being wasted.” (P.E. Teacher3)</i>
Disruption of Lesson Flow	Technical problems and limited digital skills interrupt the smooth delivery of lessons. This disruption affects not only time but also the learning quality of the students.	<i>“When the digital tool function properly, lesson delivery becomes more organized and efficient. However, when technical issues arise, I have to shift immediately to traditional teaching strategies, which can disrupt the pacing of the lesson.” (P.E. Teacher6)</i>
Instructional and Pedagogical Misalignment	Challenges in Digital Integration in PE Context	The difficulties of using digital tools in the subject physical education that focuses on movement and physical activity. Balance in using technology in physical education plays a crucial part in class because too much screen time can reduce active participation.
	Reduced Instructional Effectiveness	When digital tools used in class are not aligned with the objectives of the lesson, the focus of the lesson may shift unexpectedly and unintentionally.
		<i>“Not all the time it is applicable to all lessons due to lack of alignment of the lessons to the digital tools. One reason is because digital integration is new in education. It is not yet well-grasped, meaning, it is not yet well-formulated, and we still need to dig deeper for us to evaluate the things needed to add to the curriculum to integrate the digital tools”. (P.E. Teacher2)</i>
		<i>“The negative part is, because it is digital, students focus more on technology, especially when the presentation has a lot of designs. There’s a lot of animation, or you totally maximize the use of digital, so the content itself will be ignored.” (P.E. Teacher5)</i>

Table 19. Coping Mechanisms of Physical Education Teachers in Managing Limited Digital Literacy and Resource Constraints

Major Themes	Sub-Themes	Description	Relevant Statement
Self-Directed Learning, Skill Development, and Personal Resource Investment	Independent Learning Strategies	The teachers’ way to learn digital skills. They search, study, and explore different available resources and learn on their own to understand deeply how to use technology and different online platforms in their teaching.	<i>“Before I use different applications and integrate it into my teaching, I make sure to study first on how to use it. So, I watch video tutorials on YouTube.” (P.E. Teacher4)</i>
	Continuous Practice and Mastery	Continuous practice and mastery are the teachers’ effort to strengthen their competence through regular practice. Teachers who practice regularly before class show commitment for them to improve in using technology in their class.	<i>“To address the challenges, I watch online tutorials and practice using these tools during my free time. Through experience and continuous learning, I gradually improve my digital skills and become more confident in using technology in physical education classes.” (P.E. Teacher6)</i>
	Use of Personal Devices and Funds	Personal sacrifices teachers make to support digital integration. Many teachers use their own gadgets and spend their own money to be able to use digital tools in their instruction and teaching	<i>“Our school doesn’t provide any materials or any gadgets to use in integration on our class. It’s our own personal property. I always use my personal resources to buy those things, and also my personal money to buy load so that I can have data connection.” (P.E. Teacher7)</i>
Collaboration and Professional Support	Seeking Assistance from Colleagues	Teachers ask for help when they encounter problems in using or integrating digital tools. More experienced colleagues often provide guidance to lessen the confusion of other teachers in using digital tools.	<i>“Sometime when I get confused, what I do is I ask for help from my colleagues that is more knowledgeable in using those digital tools, they teach me step-by-step on how to use platforms like online classrooms and video meetings.” (P.E. Teacher3)</i>
	Knowledge Sharing and Peer Collaboration	The practice of sharing and learning together. Teachers often exchange knowledge with colleagues, creating a culture of collaborative learning that supports continuous professional growth.	<i>“I give insights on what available digital tools that our department can be used. For example, checking of exams became easier through online, automated checking of exams. We also use FET TV, FET site that students can access, we can use this for digital simulation of exercise.” (P.E. Teacher2)</i>
Strategic Preparation, Flexible and Adaptive Teaching Practices	Advance Preparation	Preparing ahead of time before using digital tools in class. Teachers practice using technology and online platforms, and choose tools carefully that are simple to navigate and easy to use.	<i>“What I usually do is I practice first before going to class, I check if the video or the presentation would play, I also choose simple tools that are not complicated to use.” P.E. Teacher3)</i>
	Contingency planning	Teachers prepare alternative options in case technology fails. By having backup plans, and offline accessible materials, they can continue the lesson even though technical problems arise.	<i>“Today we already have an offline PowerPoint presentation which we do not need internet connections or connectivity for us to use it. You just have to download it, practice, and navigate it by yourself. When using PowerPoint, we can convert it into JPEG or PDF.” (P.E. Teacher5)</i> <i>“For example, I am teaching specific lesson in PE using online or digital platform, like we’re using internet</i>

Reverting to Traditional Teaching Methods Blended Instructional Approaches	Teachers' readiness to return to traditional teaching methods. When digital tools fail during the class, teachers return to manual demonstrations and direct instructions. Combination of using digital tools and traditional classroom teaching. Many teachers realize that both practices must be done to achieve the desired learning goals.	<p>connection, then suddenly it stopped or something like that, so we do not have a choice. What we do is we demonstrate it manually to the students." (P.E. Teacher 8)</p> <p>"I make sure to download materials ahead of time so I can use them offline. I also prepare printed materials and visual aids as backup. I combine digital demonstration with actual teacher or student demonstration to ensure learning continuity, even if technology fails." (P.E. Teacher6)</p>
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The results of the themes revealed that physical education teachers faced several challenges in integrating digital tools into their teaching. These issues disrupt lesson flow and limit the consistent use of technology in teaching.

The results of the themes indicate that even though teachers face challenges, they also demonstrated several coping mechanisms to continue the use of technology in their teaching. These coping mechanisms demonstrate teachers' commitment to improve the quality of instruction despite technological limitations.

*Discussion*

The integration of the quantitative and qualitative findings provides a deeper understanding of how digital literacy and access to resources influence the proficiency of Physical Education teachers. Quantitative results revealed that teachers demonstrate very high levels of digital literacy, high to very high access to digital resources, and high to very high teaching proficiency in areas including lesson planning, instructional delivery, classroom management, student engagement, and assessment. Correlation analysis further indicated that digital literacy and access to resources are significantly related to teachers' proficiency which shows that teachers who possess stronger digital competencies and better technological access tend to perform more effectively in their instructional roles.

The quantitative findings showing very high proficiency in lesson planning and preparation align with existing literature emphasizing the importance of structured instructional preparation. Effective lesson planning enables teachers to align objectives, teaching strategies, and assessment methods, which contributes to improved instructional quality and student learning outcomes (Farhang et al., 2023; Khan et al., 2024). Similarly, Ushie and Daniel (2022) explain that deliberate planning allows educators to anticipate learners' needs and organize instructional resources effectively, demonstrating professional competence in teaching. The high proficiency in lesson planning observed among Physical Education teachers in this study indicates that they can integrate digital tools and resources in organizing their lessons, supporting the view that digital competence enhances instructional planning and flexibility.

The findings also revealed very high proficiency in teaching delivery and instructional strategies which reveal that Physical Education teachers can combine traditional teaching methods with digital tools to enhance instruction. Buoslog (2022) explains that modern classrooms require educators to implement diverse strategies such as experiential learning, cooperative learning, and technology-supported instruction to address diverse learning needs. The integration of digital tools

in lesson delivery observed in this study demonstrates teachers' ability to utilize technology as a complement to traditional instructional approaches in Physical Education.

The quantitative results further revealed high levels of proficiency in classroom management which include both face-to-face and online learning environments. Research by Putra and Yanto (2025) indicates that clear routines, behavioral expectations, and structured learning environments significantly improve student engagement and academic success. The ability of Physical Education teachers to manage both traditional and digital learning environments suggests that they possess the necessary pedagogical competencies to maintain productive classroom interactions while integrating technology into instruction.

Similarly, the findings indicated high levels of proficiency in promoting student engagement and participation which reflects teachers' ability to encourage active learning through both physical activities and digital platforms. Student engagement is widely recognized as a multidimensional construct involving behavioral, emotional, and cognitive involvement in learning activities (Sutton, 2021). The integration of digital tools such as interactive applications, multimedia resources, and online activities in Physical Education classes may therefore enhance students' motivation and participation, contributing to more meaningful learning experiences.

The results also demonstrated high levels of proficiency in assessment and feedback which explain that teachers can use digital tools to evaluate student performance and provide timely feedback. Effective assessment practices allow teachers to monitor student progress, adapt instructional strategies, and support learning improvement (Levy Feldman, 2025). In technology-enhanced classrooms, digital assessment platforms and online feedback mechanisms allow teachers to deliver personalized feedback and track student progress more efficiently.

The correlation analysis revealed that digital literacy is significantly related to teachers' proficiency particularly in teaching delivery, classroom management, student engagement, and assessment. This finding is consistent with previous studies indicating that teachers who possess strong digital competencies are better able to integrate technology into instruction and create interactive learning environments (Abella and Dela Rosa, 2023; Nyongesa et al., 2025). In the context of Physical Education, digital tools such as instructional videos, fitness applications, and performance tracking platforms can enhance skill development and student motivation (Moors, 2024; Corte, 2025).

The results also showed that access to resources significantly influences teachers' proficiency particularly in teaching delivery, classroom management, student engagement, and assessment. Access to digital devices, reliable internet connectivity, and digital platforms allows teachers to implement interactive and technology-enhanced instructional strategies (Sultana and Hasan, 2023). Digital tools make learning more flexible, accessible, and collaborative, allowing students to engage with materials anytime and anywhere, which is critical for academic success (Haleem et al., 2022).

While the quantitative results demonstrate high levels of digital literacy and access to resources, the qualitative findings provide deeper insights into the practical challenges faced by teachers in integrating digital tools. Teachers reported several barriers including limited digital resources, unstable internet connectivity, technical problems, and insufficient training opportunities. Hasim and Bakar (2025) support the argument which found that inadequate infrastructure, weak internet connectivity, and lack of technical support often disrupt technology-integrated teaching practices.

Teachers also reported limited familiarity with advanced digital tools and difficulties in troubleshooting technical issues which sometimes disrupt lesson flow and reduce instructional efficiency. These challenges are consistent with findings by Safitri et al. (2022), who noted that teachers often struggle with unfamiliar digital platforms and limited infrastructure, which affects their confidence in using technology in the classroom.

Despite these challenges, the qualitative findings reveal that teachers employ various coping mechanisms to sustain technology integration including self-directed learning, collaboration with colleagues, and adaptive teaching strategies. Teachers reported improving their digital competence through independent learning, such as watching online tutorials and practicing the use of digital tools during their free time. Kwaah et al. (2022) observed that educators who adopt adaptive coping strategies, such as self-learning and peer collaboration, demonstrate greater resilience and professional competence in integrating digital technologies into their teaching practices.

Collaboration among teachers also emerged as an important coping strategy. Teachers reported seeking assistance from colleagues and sharing knowledge about digital tools. Alpuerto (2022) emphasize that professional collaboration and peer mentoring enhance teachers' ability to overcome technological and pedagogical challenges. Collaborative professional networks allow educators to exchange ideas and collectively improve their digital competencies.

Teachers also demonstrated adaptive instructional strategies including the preparation of backup materials, reverting to traditional teaching methods when necessary, and implementing blended instructional approaches. Lopez (2024) discuss that effective technology integration requires not only technical expertise but also adaptability, creativity, and reflective teaching practices that allow educators to respond to challenges in dynamic classroom environments.

Furthermore, the integration of quantitative and qualitative findings reveals that while Physical Education teachers generally possess strong digital literacy and teaching proficiency, their ability to integrate digital tools effectively is

influenced by contextual factors such as infrastructure availability, institutional support, and professional development opportunities. The findings emphasize that meaningful technology integration in Physical Education requires not only digital competence but also adequate resources, continuous training, and supportive institutional environments.

#### IV. CONCLUSIONS

The study highlights how digital literacy, access to resources as well as challenges, experiences, and coping mechanisms affect the proficiency of Physical Education teachers in integrating technology into their teaching.

There is a significant relationship between digital literacy and teachers' proficiency, stating that teachers who have stronger digital skills perform better in lesson planning and preparation, teaching delivery and strategies, classroom (and online classroom) management, student engagement and participation, and assessment and feedback. The results reveal that the hypothesis is rejected. This implies that it is important to strengthen the digital literacy of teachers to improve their overall teaching proficiency, especially to effectively integrate technology into their teaching to enhance student learning outcomes.

There is significant relationship between access to resources and teachers' proficiency, particularly in internet connectivity, availability of digital tools and applications, and accessibility of digital spaces. But resources such as availability of devices and access to learning materials showed weaker relationship with lesson planning and preparation, indicating that not all resources influence every teaching function. The results reveal that the hypothesis is rejected. This implies that it is important to have a reliable internet connection, functional digital tools, and accessible digital platforms to improve teachers' proficiency because simply providing devices alone is not enough to enhance all aspects of teaching.

Teachers demonstrate commitment and persistence by developing their coping strategies such as self-learning, practicing digital tools and applications, and seeking help from co-teachers and colleagues to improve their digital skills. Continuous learning and support are important in strengthening their ability to integrate technology effectively in physical education instruction.

#### *Recommendations*

Based on the findings, the following recommendations are proposed to enhance digital proficiency, resource use, and teaching effectiveness among Physical Education teachers. Policy Makers of The Department of Education: Design more training programs that focus and are specifically designed for the integration of digital tools in physical education instruction to improve teachers' teaching proficiency. Continuous support and programs can help teachers apply what they learn in real classroom settings. By doing this, a generation of physical education teachers who are confident and proficient in digital instruction will result in higher student participation and learning outcomes. This will also result in a more traditional

teachers to become more confident in using digital technology into their teaching.

School administrations: Continue strengthen technological infrastructures by providing reliable internet connection, updated digital tools, enough digital equipment, and digital learning resources to support effective teaching. Regular monitoring and maintenance of these resources are also important to ensure uninterrupted classes. By doing this, teachers and students will have smooth access to digital tools and applications that enhance teaching quality and learning for students' active engagement.

Physical education teachers: Continuously improve their digital literacy and teaching skills by participating in professional development programs such as seminars and training that focuses on technology integration, and collaborative learning activities with other teachers to share what's best practices they can use and innovate teaching strategies. By doing this, teachers will be able to confidently integrate digital tools into lesson planning, instruction, and assessment that will lead to more engaging and effective physical education classes. This will also help to minimize the digital divide that many physical education teachers are now facing.

Students: They are encouraged to actively engage with using digital tools provided in physical education classes, this includes interactive platforms and applications, instructional videos, and online assessments. They can collaborate with their peers and classmates in learning activities using digital tools to enhance understanding and develop their skills. By doing this, students will develop digital competencies while improving their physical skills, promoting self-directed learning, and active participation.

Future researchers: Explore the long-term effects of digital literacy trainings and programs on physical education outcomes, the role of digital tools on students learning, and the impact of technologies on physical education. They may also investigate solutions to reduce the digital divide in other subject areas. Evidence-based recommendations that inform policy, curriculum development, and effective integration of technology in education.

#### Competing Interests

The authors assert the absence of competing interests.

#### Ethics Statement and Consent for Publication

This work adhered to ethical guidelines and obtained approval from the Research Ethics

Committee of the first author's institution (REC Code: REC code 2024-098). All individuals granted informed consent before their participation in the study.

#### Data Availability

The data underpinning the conclusions of this study can be obtained upon reasonable request from the corresponding author.

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