Ways forward in the teaching of Physical Education: The private and public university experiences

https://doi.org/10.58870/berj.v8i1.48

Bayani C. Matitu
College of Arts and Sciences
San Beda University, Manila, Philippines
bmatitu@sanbeda.edu.ph

Rosalinda B. Santiago
College of Arts and Sciences
San Beda University, Manila, Philippines
rsantiago@sanbeda.edu.ph

Abstract

In recent years, the integration of digital technology in education has become increasingly prevalent, with many institutions adopting e-learning tools to enhance the teaching and learning experience. Such practice was intensified with the kickoff of the pandemic in 2020 when most, if not all, educational institution around the world were forced to come up with a more innovative technique in teaching to continue learning. Schools and universities, be it private or public, opted to shift to online education. This study seeks to the variations in the technological gadgets and e-learning tools in the teaching of physical education classes through identification, chi-square testing, and Focus Group Discussion using the Replacement and Amplification of (RAT) Framework. Specifically, it examines the availability of these resources in different types of universities and investigates their effectiveness in promoting student engagement and improving pedagogical practices while exploring the differences between digital gadgets and e-learning tools and their availability in universities, with a specific focus on the effectiveness of teaching of physical education classes. The findings indicate that the types of digital gadgets (X2, 57.793, df=8), p <.000 <.05) and e-learning tools (X2, 63.36, df=19, p <.001 <.05) used by the students vary depending on the type of university- whether private or public, due to the accessibility for the students, and the popularity of the tools and apps. Furthermore, the use of e-learning tools is beneficial in enhancing pedagogical practices in physical education classes and promoting student engagement in learning tasks because of their benefits. Additionally, the study recommends further research on the use of these tools in the new educational landscape.

Keywords*:* physical education, gadgets, e-learning tools, private, public

Background of the Study

The COVID-19 pandemic has caused unprecedented disruption in various sectors, including education, economy, and world trade (Neuwirth et al., 2021). The pandemic has affected at least 1.6 billion learners worldwide and these have created new opportunities for education experts to discover alternatives to traditional forms of learning (Grob-Zakhary & Joaquin et.al, 2020). To ensure continuity of learning, a new model for international cooperation with telecommunication companies, education technology industry experts, and media is needed to complement the learning gap and create new pedagogies that are responsive to the current needs of teachers and learners (Linnes et al., 2022).

However, as promising as this new model may seem, the delivery of lessons and assessments in Higher Education Institutions (HEIs) has become a serious challenge. With students heavily relying on gadgets and e-learning tools, their accessibility becomes a concern (Das et. al, 2020; Ansari, 2020; Gikas & Grant, 2013; Cavus & Ibrahim, 2009). This is particularly true for Physical Education (PE) classes, where the achievement of standards in physical fitness, dance, individual, and team sports is threatened as students and teachers address issues like limited space and equipment at home, which limit their engagement in class (Neuwirth et al., 2021). As such, there is a need to identify various pedagogical learning tools for Physical Education subjects to help teachers better facilitate skills and for students to continue collaborating in learning despite the hurdles posed by the study-at-home education scheme (Cojocaru et al., 2022). The sudden shift to online learning has exposed gaps in the education system and challenged the traditional methods of teaching- that was considered as the better teaching method (Linnes et al., 2022). This is where the collaboration between telecommunication companies, education technology industry experts, and media comes in. By working together, they can develop new pedagogies that are responsive to the current needs of both teachers and learners (Al-hawamdeh et al., 2022).

Aleksina et al. (2021) viewed that one of the challenges in this new model of learning is the accessibility of sports classes, gadgets and e-learning tools. Not all students have access to reliable internet connection or necessary hardware to attend online classes, which can impede their learning. Moreover, some students may not have enough space at home to do physical activities that are required for Physical Education classes,

making it difficult for them to meet the curriculum's standards (Mupfiga et al., 2017; Neuwirth et al., 2021).

Virtual coaching involves using video conferencing tools to conduct physical activities with students remotely. Interactive tutorials, on the other hand, use video and interactive media to simulate physical activities that students can follow at home. Gamification of physical activities uses game design elements to promote engagement and motivate students to participate in physical activities. Thus, serving as pedagogical learning tools. (Khamidi et al., 2022)

Despite the potential benefits of e-learning tools and gadgets in physical education classes, there is a lack of research on their effectiveness in different types of universities. While previous studies have examined the impact of technology on academic achievement and engagement in various subjects, few studies have investigated the use of e-learning tools and gadgets in physical education classes, particularly in private and public universities. Therefore, this study aims to address this research gap by exploring the availability and effectiveness of e-learning tools and gadgets in physical education classes across different types of universities. The findings from this study could provide insights into the potential benefits and limitations of integrating technology in physical education instruction and inform the development of future curricula and teaching practices.

This study purports to answer the research gap that was previously stated. To be more specific, the following are the objectives this study would like to address: A) The objective of equal access to quality education is to ensure that all students, regardless of their background, have an equal opportunity to access high-quality education. This can involve providing resources, support, and educational opportunities to disadvantaged students to bridge the gap between them and their peers. B) The objective of enhancing the learning experience is to create an environment that is conducive to learning and that engages students in the learning process. This can involve using innovative teaching techniques, incorporating technology into the curriculum, and creating a supportive learning community that encourages active participation and collaboration. C) The objective of supporting effective teaching and attainment of expected outcomes in Physical Education classes is to ensure that students achieve the learning goals and objectives set out for them in the Physical Education curriculum. This can involve providing professional development opportunities for teachers, implementing evidence-based teaching practices, and assessing

student progress to identify areas for improvement. Specifically, about the digital gadgets and e-learning tools used by the learners in submitting their outputs in Physical Education classes, this study aims to answer the following research questions:

1. What is the difference between the types of digital gadgets tools when grouped according to the type of university?

2. What is the difference between the types of e-learning tools when grouped according to the type of university?

3. What are the experiences beneficial to the respondents in using digital gadgets and e-learning tools vis-à-vis the learning pedagogy?

Literature Review

Physical education (PE) is a fundamental subject in schools and universities as it promotes healthy lifestyles, fosters physical fitness, and teaches fundamental movement skills to students. Additionally, research has shown that physical activity can have a positive impact on academic performance, cognitive function, and mental health. (Liu et al., 2018; Tomporowski et al., 2015)

With the advent of the digital age, e-learning tools and gadgets have emerged that can supplement and enhance the traditional teaching methods (Neuwirth et al., 2021). According to Das et al. (2020), e-learning tools such as mobile devices, online videos, and apps can enhance the teaching and learning experience in PE by providing interactive and engaging content, promoting self-paced learning, and facilitating the development of skills and knowledge. Additionally, e-learning tools can provide students with a more personalized learning experience and allow teachers to assess student progress more effectively. (Das et al., 2020)

One of the most significant benefits of e-learning tools in PE is their ability to promote physical activity outside of the classroom. According to Ansari (2020), e-learning tools can provide students with opportunities for physical activity at home, which is particularly relevant in the current context of the COVID-19 pandemic, where many schools have had to resort to online learning. Moreover, e-learning tools can help students overcome

barriers to physical activity, such as lack of access to facilities, equipment, and transportation (Ansari, 2020). In this sense, e-learning tools can make physical activity more accessible and inclusive for all students, regardless of their background or circumstances.

However, it is important to note that e-learning tools cannot replace the importance of in-person interactions and hands-on experiences in PE instruction. Gikas and Grant (2013) argued that e-learning tools should be seen as complementary to traditional teaching methods, rather than a replacement. According to these authors, in-person interactions are crucial for developing social and emotional skills, promoting teamwork and communication, and providing students with immediate feedback on their performance. Additionally, in-person interactions allow teachers to tailor their instruction to the needs of individual students, which can be challenging to do in an online environment (Gikas and Grant, 2013). Furthermore, the use of e-learning tools in P.E, instruction also raises concerns about the digital divide and access to technology. According to Cavus and Ibrahim (2009), the digital divide refers to the unequal distribution of access to technology, which can exacerbate existing social and economic inequalities. In the context of PE instruction, the digital divide can manifest in an unequal access to e-learning tools, gadgets, and reliable internet connectivity. Therefore, it is essential to ensure that all students have equal access to technology and e-learning tools to prevent the digital divide from widening (Cavus and Ibrahim, 2009).

In the advent of emerging importance of e-learning tools and gadgets, it can supplement and enhance traditional teaching methods in PE instruction. E-learning tools can promote physical activity outside of the classroom, provide students with a more personalized learning experience, and allow teachers to assess student progress more effectively. However, it is essential to recognize that e-learning tools cannot replace the importance of in-person interactions and hands-on experiences in PE instruction. E-learning tools should be seen as complementary to traditional teaching methods rather than a replacement. Moreover, it is essential to ensure that all students have equal access to technology and e-learning tools to prevent the digital divide from widening.

But the students in private and public universities might differ in their technologies and tools used in learning physical education. One of the most important advantages is the ability to offer personalized learning experiences through e-learning tools that can be designed to meet the

specific needs of individual learners and can provide instruction that is tailored to each student's learning style, pace, and level of understanding (Tzetzis et al., 2011). This can help to ensure that all students can succeed and to reach their full potential. Moreover, e-learning tools can provide a variety of multimedia content, including videos, animations, and interactive simulations, which can help to keep students engaged and motivated (Moreno-Ger et al., 2009).

E-learning tools can also help to improve pedagogical practices in physical education. By providing teachers with more flexibility in the delivery of instruction, e-learning tools can allow for differentiated instruction, enabling teachers to better meet the needs of all learners (Shen et al., 2020). In addition, e-learning tools can be particularly useful for teaching the theory-based aspects of physical education, such as anatomy, physiology, and biomechanics that are challenging to be taught in a traditional classroom setting, although e-learning tools can provide multimedia content that can help to bring these subjects to life (Huang et al., 2010). Interactive simulations, for example, can help to illustrate complex concepts in a way that is both engaging and easy to understand.

Finally, gadgets such as fitness trackers can be an effective way to help students monitor their progress and set achievable fitness goals. By tracking their physical activity, students can get a better understanding of their fitness levels and can work to improve their overall health and well-being (Bastiani et al., 2020). Therefore, the integration of e-learning tools and gadgets in physical education classes has the potential to offer several advantages, including personalized learning experiences, increased student engagement, and improved pedagogical practices (Al-hawamdeh et al., 2022). Finally, the use of gadgets such as fitness trackers can help students to monitor their progress and set achievable fitness goals (Steinberg et al., 2019). To ensure equal access to quality education, enhance the learning experience, support effective teaching and attainment of the expected outcome in the teaching of PE classes, the researchers investigated the acceptance of the use of the digital gadgets and social media application in private and public university in Physical Education classes.

Research Gaps

The literature review in this research identified methodological limitations, contextual limitations, and settings limitations as the conspicuous research gaps. The specific digital gadgets and e-learning tools

were not investigated in the Philippines. Also, only Belleza et al. (2021) have research settings in the Philippines (1 out of 12 journal articles reviewed). Rodríguez and Pulido-Montes (2022) reviewed 44 journal articles about digital resources in higher education and Baran (2014) reviewed 37 articles on mobile learning and teacher education. Only Cojocaru et al. (2022) conducted a high level of quantitative analysis using confirmatory factor analysis (CFA) and partial least squares structural equations modelling (1 out of 12 journal articles reviewed). Khamidi et al. (2022) reviewed 16 research on physical education learning. This research intended to provide descriptive indications of the differences in the types of digital gadgets and e-learning tools used by private and public universities.

Conceptual Model

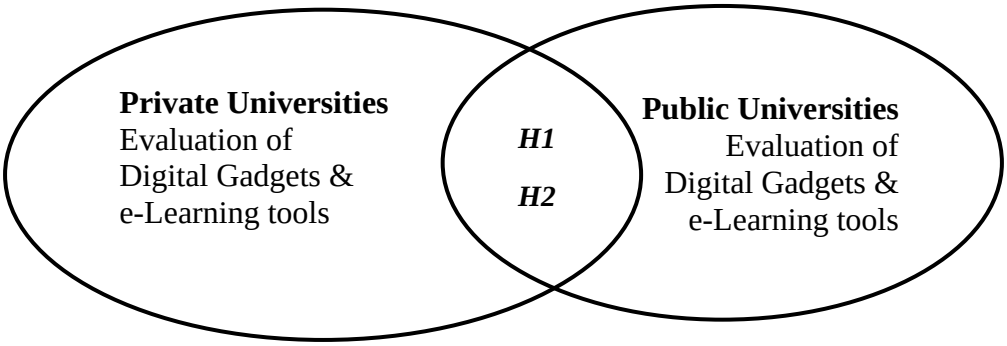
This section aims to evaluate the digital gadgets and e-learning tools among the physical education classes between private and public universities. Specifically, this research follows the RAT Framework, which stands for Replacement, Amplification, and Transformation, is a useful guide for educators and instructional designers to evaluate the effectiveness of technology integration in teaching and learning as well as design the class modules (Hughes et al., 2006).

According to Hughes et al. (2006), the first category, *Replacement*, involves using technology to replace traditional teaching methods, without significantly changing the nature of the learning experience. For example, using online quizzes to replace paper-based tests, or watching educational videos instead of attending lectures in person. In this category, technology is used to replicate traditional methods, without enhancing the learning experience. The second category, *Amplification*, involves using technology to enhance traditional teaching methods by amplifying their effectiveness. For example, using multimedia presentations to illustrate complex concepts, or online forums to facilitate discussions and peer learning. In this category, technology is used to augment the effectiveness of traditional teaching methods, without significantly changing the nature of the learning experience. The third category, *Transformation*, involves using technology to fundamentally change the nature of the learning experience, by introducing new modes of interaction and modes of learning. For example, using virtual reality simulations to allow students to explore complex concepts, or gamification to motivate students and make learning more engaging. In this category, technology is used to create new learning

experiences that are not possible with traditional teaching methods. (Hughes et al., 2006)

Figure 1.

Conceptual Framework



As seen in Figure 1, the RAT framework provides a rationale for educators to evaluate the differences in the tools in technology integration in teaching and learning physical education, and to identify areas where technology can be used to enhance and transform the learning experience (Hughes et al., 2006). By understanding the different levels of technology integration, educators can make informed decisions about the selection and use of technology in their teaching and ensure that technology is used in a way that maximizes its potential to improve learning outcomes. While there have been several research on the use of technology in the classroom, little has been written about the application of the aspects of RAT Framework to determine its effect in teaching physical education classes. (Kimmons, et al., 2015)

Hypothesis Development

To describe the current teaching and learning adaptations that replace the traditional method of teaching and learning physical education in the selected public and private universities in Metro Manila, this research tested the differences between the types of digital gadgets and e-learning tools to better understand the improvement areas in the lessons and curriculum modules.

Aleksina et al. (2021) argued that the investments of the universities and the popularity of the digital technologies determine its integration into the academic classes. The public universities are more concerned about the outcome of the application while the commercial institutions typically are driven by profit goals (Aleksina et al., 2021). Steinberg et al. (2019) pointed out that physical education outside the sports hall emerged with the growing use of smartphones, personal gadgets, and mobile phones. In Zimbabwe, 81% of the students in universities while 54% of teachers own mobile devices like including smartphones, laptops, and PC tablets (Mupfiga et al., 2017). In Silicon Valley, Kim and Padilla (2021) observed that 76.4% of families have broadband services at home, 50.9% have school loan device, while 36.4% of families have no access to a computer or a tablet. Furthermore, the adjustments in use of digital tools and success of teachers in delivering the knowledge and skills to their students depend on the characteristics of being accessible, enthusiastic, passionate, and knowledgeable (Whittle et al., 2018). The first hypothesis is formulated:

H1: The types of digital gadgets among the physical education classes differ between the private and public universities.

With the understanding of the alarming circumstances in teaching physical education, alternative methods using e-learning tools and apps were devised in teaching that was different from real-time online teaching (Belleza et al., 2021). According to Khamidi et al. (2022), the students perform self-practice at home with parental supervision especially on the skill movements provided by the teachers typically in the form of videos on WhatsApp and Youtube. Neuwirth et al. (2021) gave importance to the behavioral engagement of students during online classes like on turning on their computer cameras, doing the raise hand tools, active participation in chat box, unmuting their microphones, and discussion. In asynchronous classes, the behavioral engagement of students through accomplishment of assignments and participation in discussion boards are necessary (Neuwirth et al., 2021). Some of the e-learning tools are using fitness sites, computer games, mobile apps, and video editing (Cojocaru et al., 2022). Rodriguez and Pulido-Montes (2022) generalized in 44 reviewed literature that educational innovation and the application of blended learning pedagogies were not yet implemented to a high degree but COVID-19-enforced transition from the traditional face-to-face education to distance education that utilized videoconferencing, videos, and social networks. Linnes et al. (2022) valued the advantages of the traditional learning methods and viewed the benefits of digital or e-learning if given more personalization to

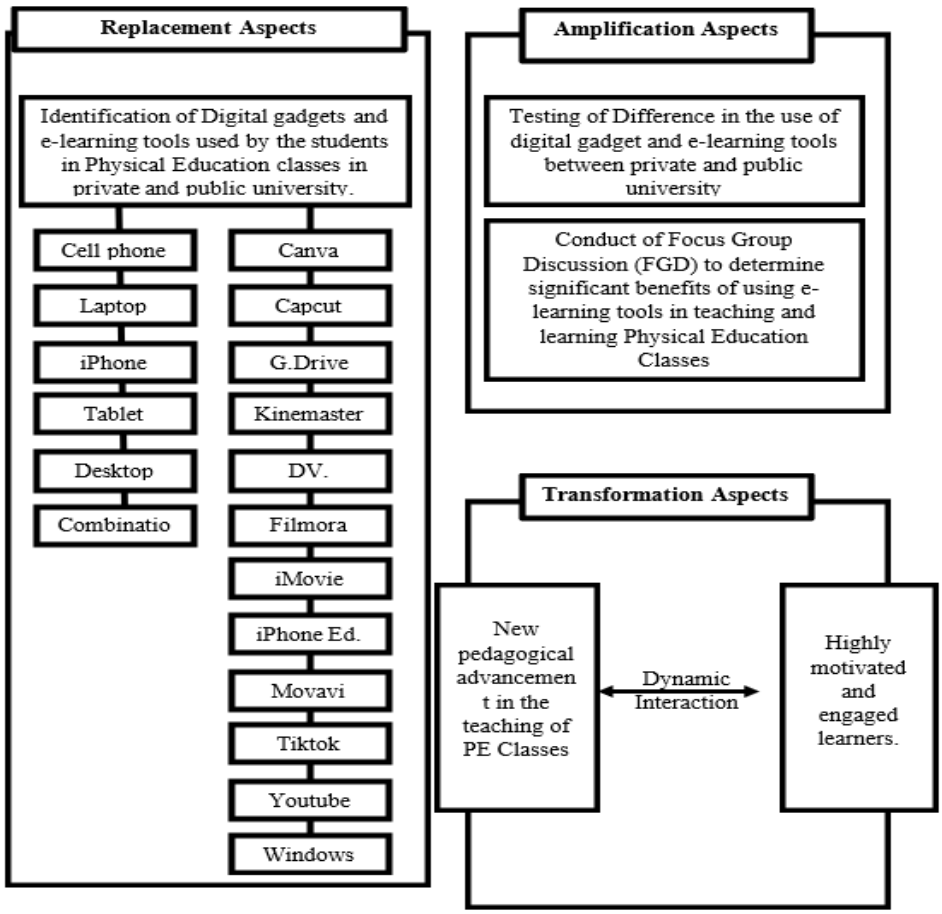
repeat lectures, access to upgraded information, gain cost savings, perform transferability to other settings) as well as reduce environmental effects. Thus, this study proposed the 2nd research hypothesis:

H2: The types of e-learning tools among the physical education classes differ between the private and public universities.

However, the availability and effectiveness of digital gadgets and e-learning tools may vary across different types of universities. Private universities may have more resources and infrastructure to support the integration of technology, while public universities may face more constraints due to limited funding and resources (Aleksina et al., 2021).

Figure 2.

The Operational Framework using the RAT Framework



By using the Replacement, Amplification, and Transformation (RAT) framework, this study aims to determine the extent to which different types of technologies are being used to replace traditional teaching methods, amplify the effectiveness of these methods, or transform the learning experience altogether (Hughes et al., 2006). Additionally, this study will explore the specific skills and competencies that can be developed using technology in physical education classes, and how these may differ across private and public universities. This research investigated the replacement aspects that involve the different types of digital tools and apps as replacement to the traditional method of teaching physical education. This research also investigated the amplification aspects to highlight the benefits of the use of digital gadgets and e-learning tools in physical education classes in higher education, as shown in Figure 2. However, this research did not investigate the transformation aspects.

Methodology

This research adopted a mixed method approach that utilized both quantitative and qualitative descriptive research (Mupfiga et al., 2017). This approach was appropriate for the research questions and objectives as it seeks to explore the potential benefits of using e-learning tools in physical education classes in both private and public universities. The mixed-methods approach enabled the researcher to examine the relationship between the availability and use of e-learning tools and the students' engagement and learning outcomes in physical education classes. The cross-validation of data sources will strengthen the validity of the results, providing a more comprehensive and reliable understanding of the research phenomenon.

The research employed a random sampling approach to the selected 120 students from a private university and 120 students from a public university, all taking Physical Education classes 1, 2, 3, and 4 during the second semester of the academic year 2021-2022. The study assumed that there is no significant difference between the gadgets and e-learning tools used by students in both private and public universities. However, it is important to note that this assumption might not hold true, as private universities might have greater access to funding and resources for acquiring better quality digital gadgets and e-learning tools compared to public universities. Hence, the results of the study should be interpreted with this limitation in mind. The data collection method involved seeking

permission from the unit head of Physical Education department of the universities, followed by Google Forms to gather quantitative data. The questionnaire was designed with attention to the research questions and objectives, as well as to previous research in the field. Data collection was conducted over a one-week period. The research team ensured that participants' data remained confidential and anonymous by using a numbering scheme and removing any identifiable information. A chi-square test of goodness of fit was conducted using Statistics Kingdom online calculator to test the null hypothesis that there is no difference between the types of digital gadgets and e-learning tools used by the private and public universities (Anderson et al., 2018). The level of significance used for the test was set at 0.05. Only thirty students responded to the invitation for a Focus Group Discussion (FGD). FGD was conducted to address the 3rd specific research objective. The data were analyzed using a thematic analysis approach to identify common themes and patterns in the responses (Mupfiga et al., 2013). The moderator recorded the discussion and transcribed it verbatim. The researchers then independently reviewed the transcripts and coded the data, before coming together to discuss and reconcile any discrepancies in the coding (Creswell, 2013). The final themes were then identified and presented.

Results and Discussion

This section highlighted the findings from the quantitative analysis of data collected, as well as the qualitative data collected through focus group discussions. The implications of these findings for the integration of technology into physical education teaching in different university contexts were also discussed.

Table 1.

The Types of Digital Gadgets in P.E. Classes of Private and Public Universities

Digital Gadgets	Class	Group	Private (f)	Percentage	Public (f)	Percentage
Cell Phone	PE 1	g1	14	11.67%	24	20.00%
	PE 2	g2	15	12.50%	25	20.83%
	PE 3	g3	10	8.33%	21	17.50%
	PE 4	g4	10	8.33%	20	16.67%
Cell Phone and Desktop	PE 1	g5	4	3.33%	1	0.83%
	PE 2	g6	6	5.00%	2	1.67%
	PE 3	g7	1	0.83%	2	1.67%
	PE 4	g8	2	1.67%	3	2.50%
Cell Phone and Laptop	PE 1	g9	8	6.67%	3	2.50%
	PE 2	g10	7	5.83%	2	1.67%
	PE 3	g11	15	12.50%	4	3.33%
	PE 4	g12	10	8.33%	4	3.33%
Desktop & Tablet	PE 1	g13	0	0.00%	0	0.00%
	PE 2	g14	1	0.83%	0	0.00%
	PE 3	g15	1	0.83%	1	0.83%
	PE 4	g16	2	1.67%	1	0.83%
Iphone	PE 1	g17	2	1.67%	0	0.00%
	PE 2	g18	1	0.83%	1	0.83%
	PE 3	g19	1	0.83%	1	0.83%
	PE 4	g20	5	4.17%	0	0.00%
Tablet	PE 1	g21	2	1.67%	2	1.67%
	PE 2	g22	0	0.00%	0	0.00%
	PE 3	g23	1	0.83%	1	0.83%
	PE 4	g24	2	1.67%	2	1.67%
Total		**24**	**120**	**100.00%**	**120**	**100.00%**

As seen in Table 1, the most used devices by students in both private and public universities were evident that cellphones were the most widely used devices among students for enhancing their physical education experience. The use of cellphones as a learning resource significantly increased during the pandemic. The students relied on them for accessing

online classes, tracking their progress, and participating in various physical activities. The mobility and convenience offered by cellphones made them ideal tools for students to engage in physical education activities from anywhere at any time. Students could easily access a wide range of fitness apps, workout videos, and other resources that allowed them to enhance their fitness levels, improve their skills, and monitor their progress. The finding that desktops and tablets have the lowest ranking in terms of usage among students in physical education classes is noteworthy. It suggests that students prefer more portable devices that are easier to carry and use, such as smartphones or wearable technology. This could be attributed to the fact that smartphones are more affordable and accessible to students, and they can easily access them for learning purposes. Moreover, the socioeconomic status of the students may also be a contributing factor to the low usage of desktops and tablets. These devices may be less affordable and accessible for some students, especially those from lower-income families or those living in rural areas with limited internet access. The use of technology in physical education has become increasingly important, especially during the pandemic when students have limited access to in-person learning opportunities. It also highlights the need for educators to integrate technology, particularly cellphones, in physical education classes to enhance the learning experience of students. By leveraging the potential of cellphones and other portable devices, educators could develop innovative teaching strategies to promote active participation and engagement among students. This could also help educators to address the challenges of limited space and equipment that many students face while learning from home.

As predetermined based on popularity of usage and tabulated in Table 2, the increasing use of e-learning tools and gadgets in physical education classes has brought a significant change in the learning environment of college students. In the recent study, various e-learning tools were profiled including Canva, Capcut, Google Drive, Kinemaster, Davinci Resolve, Filmora, iMovie, iPhone editing, Movavi, Tiktok, YouTube, and Windows video editing. The study revealed that the top 5 e-learning tools preferred by college students in learning physical education classes include Tiktok, Capcut, YouTube, Canva, and Google Drive, as shown in Table 2. This implies that the choice of e-learning tools by college students is not only dependent on its availability but also its suitability for the learning activity.

Table 2.

The Types of e-Learning Tools in P.E. Classes of Private and Public Universities

e-Learning Tools	Class	Group	Private (f)	Percentage	Public (f)	Percentage
Canva	PE 1	g1	5	4.17%	2	1.67%
	PE 2	g2	7	5.83%	3	2.50%
	PE 3	g3	4	3.33%	6	5.00%
	PE 4	g4	4	3.33%	3	2.50%
Capcut	PE 1	g5	6	5.00%	5	4.17%
	PE 2	g6	10	8.33%	4	3.33%
	PE 3	g7	7	5.83%	4	3.33%
	PE 4	g8	5	4.17%	4	3.33%
Google Drive	PE 1	g9	0	0.00%	4	3.33%
	PE 2	g10	0	0.00%	4	3.33%
	PE 3	g11	0	0.00%	3	2.50%
	PE 4	g12	0	0.00%	5	4.17%
Kinemaster	PE 1	g13	0	0.00%	5	4.17%
	PE 2	g14	0	0.00%	3	2.50%
	PE 3	g15	0	0.00%	4	3.33%
	PE 4	g16	0	0.00%	2	1.67%
DaVinci Resolve	PE 1	g17	2	1.67%	0	0.00%
	PE 2	g18	0	0.00%	0	0.00%
	PE 3	g19	2	1.67%	0	0.00%
	PE 4	g20	3	2.50%	0	0.00%
Filmora	PE 1	g21	2	1.67%	0	0.00%
	PE 2	g22	2	1.67%	0	0.00%
	PE 3	g23	3	2.50%	0	0.00%
	PE 4	g24	2	1.67%	0	0.00%
iMovie	PE 1	g25	2	1.67%	0	0.00%
	PE 2	g26	2	1.67%	0	0.00%
	PE 3	g27	2	1.67%	0	0.00%
	PE 4	g28	1	0.83%	0	0.00%
iPhone Editing	PE 1	g29	3	2.50%	0	0.00%
	PE 2	g30	0	0.00%	0	0.00%

Table 2.

Continued.

e-Learning Tools	Class	Group	Private (f)	Percentage	Public (f)	Percentage
	PE 3	g31	2	1.67%	0	0.00%
	PE 4	g32	0	0.00%	0	0.00%
Movavi	PE 1	g33	0	0.00%	0	0.00%
	PE 2	g34	2	1.67%	1	0.83%
	PE 3	g35	3	2.50%	0	0.00%
	PE 4	g36	3	2.50%	2	1.67%
Tiktok	PE 1	g37	5	4.17%	8	6.67%
	PE 2	g38	2	1.67%	10	8.33%
	PE 3	g39	3	2.50%	7	5.83%
	PE 4	g40	2	1.67%	10	8.33%
Youtube	PE 1	g41	2	1.67%	6	5.00%
	PE 2	g42	4	3.33%	5	4.17%
	PE 3	g43	3	2.50%	6	5.00%
	PE 4	g44	7	5.83%	4	3.33%
Windows Video Editing	PE 1	g45	3	2.50%	0	0.00%
	PE 2	g46	1	0.83%	0	0.00%
	PE 3	g47	1	0.83%	0	0.00%
	PE 4	g48	3	2.50%	0	0.00%
Total		**48**	**120**	**100.00%**	**120**	**100.00%**

The use of e-learning tools such as Tiktok, Capcut, and YouTube increased students' motivation, engagement, and achievement of the skills and competencies required in physical education classes. The use of Tiktok, for instance, improved students' motor skills, coordination, and flexibility. Tiktok is a social media platform that allows students to create and share short videos of their physical activities, providing a fun and interactive way of learning. Similarly, Capcut, a video editing tool, allowed students to create engaging and informative videos that showcase their learning progress. Canva and Google Drive, on the other hand, were tools that supported students in the creation and sharing of various types of content. Canva is a graphic design platform that enables students to create visually appealing posters, flyers, and infographics, while Google Drive is a cloud-based storage system that facilitates the sharing of files and documents.

According to the respondents, these tools enhanced the teaching of theory-based aspects of physical education by providing multimedia content and interactive simulations. However, the study revealed that iPhone editing tools were the least used among the e-learning tools. This could be because iPhones are less affordable and accessible to some students compared to other devices. Furthermore, the availability of these e-learning tools in mobile versions supports the findings presented in Table 1, which indicate that students are mostly mobile users. The use of mobile devices has provided students with the flexibility to learn at their own pace and time, enabling opportunities for differentiated instruction.

H1: The types of digital gadgets among the physical education classes differ between the private and public universities.

A chi-square test of goodness of fit was performed to examine the difference between the private and public university and the type of gadget in teaching and learning Physical Education classes type of gadget they prefer to use, as shown in Table 3.

Table 3.

Chi-square Test of Goodness of Fit between the Digital Gadgets used by the P.E. Classes of Private and Public Universities

Digital Gadgets	**chi-square**	**df**	**p-value**		**effect size phi**	
Cell Phone	18.929	3	0.000	significant difference	0.62	Large
Cell Phone and Desktop	17.833	3	0.000	significant difference	1.17	Large
Cell Phone and Laptop	63.330	3	0.000	significant difference	1.24	Large
Desktop & Tablet	-	-	-	-	-	inadequate n
Iphone	-	-	-	-	-	inadequate n
Tablet	0.000	2	1.000	no significant difference	0.00	None
Overall Gadget	**35.173**	**23**	**0.000**	**significant difference**	**0.71**	**Large**
Overall Gadget	**57.793**	**8**	**0.000**	**significant difference**	**0.74**	**Large**

The difference between these variables is highly significant, X^2, (57.793, df=8), p <.000 <.05. This means that the types of digital gadgets are different between private and public university. This means that the choice of gadget is not random or independent of the type of university where the student is enrolled. The finding is important because it suggests that the factors that influence the choice of gadget in teaching and learning physical education classes may differ between private and public universities. Understanding these factors is important in developing effective strategies for integrating technology in physical education and in addressing the unique needs of students from different university types. Overall, the finding highlights the importance of considering contextual factors in planning and implementing technology-based instruction in physical education. Aleksina et al. (2021) are right in considering that the popularity of the digital technologies determines its integration into the academic classes, but it is partially sound in saying that the public universities are more concerned about the outcome of the application while the commercial institutions typically are triggered by profit goals. The digital gadgets matched the study of Mupfiga et al. (2017) Steinberg et al. (2019) on the growing use of smartphones, personal gadgets, laptops, PC, Tablets, and mobile phones in physical education. In Zimbabwe, 81% of the students in universities while 54% of teachers own mobile devices including smartphones, laptops, and PC tablets. The observations of Kim and Padilla (2021) matched the concern about the availability of broadband services at home and few students have no access to a computer or a tablet. The success of the P.E. classes depends on the passion, behavior and knowledge of the teachers as also pointed out by Whittle et al. (2018).

H2: The types of e-learning tools among the physical education classes differ between the private and public universities.

Table 3.

Chi-square Test of Goodness of Fit between the e-Learning Tools used by the P.E. Classes of Private and Public Universities

e-Learning Tools	chi-square	df	p-value	interpretation	effect size phi	interpretation
Canva	10.833	3	0.013	significant difference	0.74	Large
Capcut	11.700	3	0.008	significant difference	0.65	large
Google Drive	16	3	0.001	significant difference	infinity	large
Kinemaster	14	3	0.003	significant difference	infinity	large
DaVinci Resolve	-	-	-	-	-	inadequate n
Filmora	-	-	-	-	-	inadequate n
iMovie	-	-	-	-	-	inadequate n
Iphone Editing	-	-	-	-	-	inadequate n
Movavi	-	-	-	-	-	inadequate n
Tiktok	16.211	3	0.001	significant difference	1.16	large
Youtube	6.617	3	0.085	no significant difference	0.64	large
Windows Video Editing	-	-	-	-	-	inadequate n
Overall e-Learning Tools	**59.304**	**47**	**0.000**	**significant difference**	**.92**	**large**
Overall e-Learning Tools	**63.36**	**19**	**0.000**	**significant difference**	**0.91**	**large**

The same analysis method was used to determine the difference in the e-learning tools in teaching and learning Physical Education classes. The relationship between these variables is highly significant, X^2, (63.36, df=19), p <.001 <.05. This means that the types of e-learning tools used by the students vary according to the type of university. This implies that public universities may have a more diverse student population, including students from lower-income backgrounds. These students may have less access to technology outside of the classroom, which can impact their ability to use e-learning tools and digital gadgets for their coursework.

Belleza et al. (2021) are right in recognizing that alarming circumstances motivated the use of e-learning tools in physical education. Khamidi et al. (2022) are similar in highlighting the students' self-practice at home with parental supervision especially on the skill movements provided by the teachers needed e-learning tools. The students are equally responsible for the effectiveness of the synchronous and asynchronous classes as also pointed out by Neuwirth et al. (2021). Videoconferencing, videos, and social networks are the tools used in the transition from traditional learning methodologies, as also mentioned by Rodriguez and Pulido-Montes (2022). Again, some of the e-learning tools are using fitness sites, computer games, mobile apps, and video editing (Cojocaru et al., 2022).

What are the experiences beneficial to the respondents in using digital gadgets and e-learning tools vis-à-vis the learning pedagogy?

Based on the responses of the selected P.E. students to the above open question during FGD, these are the benefits that the respondents get from using e-learning tools to make learning productive and engaging highlights the positive impact that e-learning tools can have on students learning experiences.

***Connectivity*:** E-learning tools help connect students with their peers and instructors regardless of their physical location. This can promote a sense of community and collaboration among students. Students who might not have had the opportunity to interact with one another due to geographical or other barriers can now connect and work together on projects or assignments. This collaboration can also help to foster a more inclusive learning environment, where students from diverse backgrounds can come together to share their perspectives and learn from one another.

***Communication*:** E-learning tools facilitate communication between students and instructors, allowing for timely feedback and clarification of concepts. Overall, e-learning tools facilitate communication between students and instructors, which is essential for effective teaching and learning. By providing a platform for timely feedback and clarification of concepts, e-learning tools can help to enhance student understanding and improve academic performance. These are similar to the arguments of Steinberg et al. (2019).

***Collaboration*:** E-learning tools enable students to collaborate on projects and assignments, fostering teamwork and critical thinking skills. Furthermore, the collaborative nature of e-learning tools encourages students to take ownership of their learning experience. By working together, students can help each other to overcome obstacles and challenges, and support one another in their learning journey. The use of e-learning tools can also help to prepare students for the demands of the modern workplace. In many industries, collaboration and teamwork are essential for success, and e-learning tools provide an opportunity for students to develop these skills in a supportive environment.

***Discovery*:** E-learning tools provide students with access to a wealth of information and resources, encouraging exploration and discovery of new ideas and perspectives. E-learning tools have revolutionized the way that student's access and engage with information and resources. One of the most significant advantages of e-learning tools is that they provide students with access to a wealth of information and resources, encouraging exploration and discovery of new ideas and perspectives. With e-learning tools, students can access a variety of multimedia resources such as videos, podcasts, and online libraries, allowing them to engage with different learning materials that suit their learning styles. E-learning tools can also provide students with access to experts in their fields, who can offer insights and perspectives that might not be available in a traditional classroom setting. These are similar to the premises mentioned by Linnes, et al. (2022).

***Creativity*:** E-learning tools offer a range of multimedia options, such as video, audio, and interactive activities, which can inspire creativity and engagement in the learning process. Video and audio resources are particularly effective in engaging students and providing a more immersive learning experience (Neuwirth et al., 2021). Educational videos can bring complex concepts to life and help to explain difficult topics in a more accessible way. These resources can provide students with valuable insights and perspectives that may not be available through traditional classroom resources where there is limited use of technology-based or internet-based application as utilized in the teaching and learning method of Physical Education classes.

***Availability of resources*:** E-learning tools have revolutionized the way students' access and engage with learning resources (Mupfiga, 2017). One of the most significant advantages of e-learning tools is that they

provide students with access to a variety of learning resources that may not be available in a traditional classroom setting.

***Enjoyment*:** E-learning tools have the potential to make the learning process more enjoyable and engaging for students, which can enhance their motivation and retention of the material. By providing a more interactive and personalized learning experience, e-learning tools can create a more stimulating and immersive learning environment that appeals to a range of learning styles (Tzetzis et al., 2011). Another way in which e-learning tools can make the learning process more enjoyable and engaging is through the use of multimedia resources, as mentioned in previous findings. Videos, audio resources, interactive activities, and simulations can provide students with a more dynamic and immersive learning experience, making the learning process more enjoyable and engaging. Furthermore, e-learning tools can be personalized to meet the needs and interests of individual students, which can further enhance engagement and motivation (Das et al., 2020).

Research Limitations

This research did not measure the effectiveness of the traditional method of teaching physical education. The context is limited to understanding the statistical difference in the types of digital gadgets and e-learning tools in physical education learning among private and public universities. This research also understands the benefits experience by the students in using the different digital gadgets and e-learning tools to leverage the strengths of these technologies in physical education classes, in the new normal. The research scope is also limited to the selected universities in Metro Manila. The sample size and different settings need to be increased in future research to increase the external consistency and reliability of the succeeding studies.

Conclusion and Recommendation

Private and public universities differ on the types of digital gadgets used by the students in learning physical education. They also differ on the differ on the types of e-learning tools or apps used by the students in physical education. The conclusion of the study indicates the potential of technology in enhancing physical education classes and promoting student engagement. The study highlights the effectiveness of e-learning tools in

improving pedagogical practices and providing students with personalized learning experiences. The study also shows that the availability of digital gadgets and e-learning tools varies depending on the type of university. This suggests that educators and policymakers must consider the differences in the availability and accessibility of digital resources across different educational settings.

The qualitative benefits identified by the physical education students are connectivity, communication, discovery, availability of resources creativity, and enjoyment. The quality of physical education classes can be significantly enhanced by providing educators with the necessary training and professional development opportunities. With the increasing importance of technology and e-learning tools in physical education, it is vital that educators are familiar with the latest advancements and can integrate them effectively into their teaching methods. By providing training and professional development opportunities, educators can stay up to date with the latest trends and ensure that they are equipped to provide the best possible learning experience for their students.

In addition to providing training and professional development opportunities, the integration of technology in physical education must be done with consideration of the socio-economic background of the students. This is important to ensure equal access and opportunity for all learners, regardless of their socio-economic status. The implementation of technology in physical education classes should not create a digital divide or exclude students who do not have access to the necessary resources. Educators should be mindful of the needs of all their students and make efforts to provide equal opportunities for all to learn and participate in physical education classes.

Moreover, the integration of technology in physical education classes must also consider the potential risks and challenges associated with the use of technology. Educators must ensure that the use of technology does not compromise the safety and well-being of their students. It is crucial to establish appropriate guidelines and protocols for the use of technology in physical education classes and ensure that students are using the technology responsibly and safely. In the wake of the COVID-19 pandemic and the consequent shift to remote learning, the role of technology in education has gained unprecedented significance. Physical education classes have been greatly impacted by this shift, and it is essential to study the impact of e-learning tools and technological gadgets on the development of specific skills and competencies in this domain. To ensure the continuity and effectiveness of physical education, it is vital to investigate the

integration of technology in promoting physical activity and healthy lifestyle behaviors in the new educational landscape.

Research on the use of technology in physical education has been ongoing for some time, but the current situation presents a unique opportunity to investigate its role in the current educational landscape. With the increase in screen time and sedentary behavior due to remote learning, it is even more crucial to explore the use of technology in promoting physical activity and healthy habits. The implementation of e-learning tools and technological gadgets in physical education classes can potentially address these concerns by providing innovative and engaging ways to promote physical activity and a healthy lifestyle.

Future research should focus on investigating the effectiveness of various e-learning tools and technological gadgets in promoting physical activity and healthy habits. This research should include the evaluation of the impact of these tools on different age groups and populations, as well as the identification of best practices for integrating technology into physical education classes. Additionally, research should explore how technology can be used to promote socialization and collaboration in physical education classes, which are important components of the learning experience.

In addition, the effective integration of technology in physical education classes must also consider the needs and preferences of students. Educators should aim to make the learning experience engaging and interactive by using a variety of e-learning tools and technological gadgets. Moreover, they should make efforts to tailor the learning experience to the individual needs of their students to ensure that they are motivated and engaged in the learning process.

Overall, the integration of technology in physical education classes can have a significant positive impact on the health and well-being of students, as well as their academic and professional development. By embracing the potential of technology in physical education classes and collaborating among educators, policymakers, and stakeholders, we can ensure equitable access to digital resources and promote student engagement. With these efforts, we can create a more engaging and effective learning experience for all students and ensure that they become proficient in technology and digitally literate, setting them up for future success.

References

Abbas, J., Aman, J., Nurunnabi, M. & Bano, S. (2019). *The Impact of social media on learning behavior for sustainable education: Evidence of students from selected universities in Pakistan.* MDPI: *Sustainability, 11*(6), 1683. https://doi.org/10.3390/su11061683

Aleksina, A. Kazakova, O. & Aleksin, A. (2021). Application of digital solutions in the physical culture and sports industry as an element of sustainable regional development. *E3S Web of Conferences 295*, 01015 (2021). WFSDI 2021. https://doi.org/10.1051/e3sconf/202129501015

Al-hawamdeh, B.O.S. & Alam, S. (2022). Praxis and effectiveness of pedagogy during pandemic: An investigation of learners' perspective. *Hindawi Education Research International,* 3671478, 1-9. https://doi.org/10.1155/2022/3671478

Ali, W. (2020). Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. *ERIC, Higher Education Studies,10*(3),16-25. https://eric.ed.gov/?id=EJ1259642

Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. (2018). *Modern Business Statistics with Microsoft office Excel (*6th ed.). SouthWestern/Thomson Learning.

Ansari, J.A.N. & Khan, N.A. (2020). Exploring the role of social media in collaborative learning in the new domain of learning. *SPRINGER: Smart Learning Environments,7(*9).

Bastiani, L., Galanti, G., & Ferrari, A. M. (2020). Wearables for physical activity monitoring in school age children. *Children, 7*(3), 18.

Baran, E. (2014). A Review of Research on Mobile Learning in Teacher Education. *Educational Technology & Society, 17* (4), 17–32. http://www.jstor.org/stable/jeductechsoci.17.4.17

Belleza, S. S., Ompoc, R. D. & Vestil, C. F. (2021). Challenges of PE Teachers to educational technologies in new normal: The changing role of Teachers. *International Journal of Research Publication, 86*(1), 74-81. https://doi:.10.47119/IJRP1008611020212320

Bundy, A. C., Naughton, G., Tranter, P., Wyver, S., Baur, L., Schiller, W., ... & Bauman, A. (2011). The Sydney playground project: popping the bubblewrap—unleashing the power of play: a cluster randomized controlled trial of a primary school playground-based intervention aiming to increase children's physical activity and social skills. *BMC Public Health, 11*(1), 1-11.

Cavus, N., & Ibrahim, D. (2009). M-learning: An experiment in using SMS to support learning new English language words. *British Journal of Educational Technology*,*40*(1), 78–91.

Chan, W.T.Y., Leung, C.H. (2016). The use of social media for blended learning in tertiary education. *Universal Journal of Educational Research, 4*(4), 771-778. DOI: 10.13189/ujer.2016.040414 s

Chawinga, D. W. (2017). Taking social media to a university classroom: teaching and learning using Twitter and blogs. *International Journal of Educational Technology in Higher Education*. https://www.doi.org/10.1186/s41239-017-0041-6

Cojocaru, A.M., Bucea-Manea-Tonis, R., Jianu, A., Dumangiu, M.A., Alexandrescu, L.U., & Cojocaru, M. (2022). The Role of Physical Education and Sports in Modern Society Supported by IoT—A Student Perspective. *Sustainability, 14*, 5624. https://doi.org/10.3390/ su14095624

Creswell, J.W. (2013). Steps in conducting a scholarly mixed methods study. *DBER Speaker Series, 48,* 1-54. https://digitalcommons.unl. edu/dberspeakers/48

Culpan, I., & Kılıç, E. (2020). The effect of using TikTok in physical education classes on the development of motor skills. *Pedagogical Research, 5(*3), em0096.

Das, Ronnie, and Wasim Ahmed (2020). *Despite Concerns, COVID-19 Shows How SocialMedia has Become an Essential Tool in the Democratization of Knowledge.* The London School of Economics NS Political Science, June 5, 2020.

Dzhingaro, Boris (2020). *Types of Modern Communications Devices.* WebRTC Expert Feature Special Guest**,** February 10, 2020 https://www.webrtcworld.com/topics/from-the-experts/articles/444422-types-modern-communications-devices.htm

Gikas, J., & Grant, M. M. (2013). *Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. Internet and Higher Education Mobile, 19*, 26. https://doi.org/10.1016/j.iheduc.2013.06.002. Google Scholar

Grob-Zakhary, R. (2020, Oct.15). COVID-19 is an Opportunity to Reset Education. Here are 4 Ways How. *World Economic Forum, Oct. 15, 2020, SGD 04: Quality Education/COVID-19.*

Bastiani, L., Galanti, G., & Ferrari, A. M. (2020). Wearables for physical activity monitoring in school age children. *Children, 7*(3), 18.

IBE-UNESCO (2023). Collaborative Learning. *UNESCO: International Bureau of Education, 15, Route des Morillons 1218 Le Grand-Saconnex, Geneva, Switzerland*. http://www.ibe.unesco.org/en/glossary-curriculum-terminology/c/collaborative-learning Enhanced Creativity

Hughes, J., Thomas, R. & Scharber, C. (2006). Assessing Technology Integration: The RAT – Replacement, Amplification, and Transformation - Framework. In C. Crawford, R. Carlsen, K. McFerrin, J. Price, R. Weber & D. Willis (Eds.), *Proceedings of SITE 2006--Society for Information Technology & Teacher Education International Conference* (pp. 1616-1620). Orlando, Florida, USA: Association for the Advancement of Computing in Education (AACE). https://www.learntechlib.org/primary/p/22293/.

Joaquin, J.J.B., Biana, H.T., and Dacula, M.A. (2020). *The Philippine Higher Education Sector in the Time of COVID-19*. Southeast Asian Research Center and Hub, De La Salle University, Manila, Philippines

Jung, E., & Lee, J. W. (2021). The Effect of e-Learning Environment on Physical Education Learning Achievement and Learner Satisfaction. *Journal of Digital Convergence, 19*(4), 159-169.

Kim, C.J.H. & Padilla, A. M. (2020). Technology for Educational Purposes Among Low-Income Latino Children Living in a Mobile Park in Silicon Valley: A Case Study Before and During COVID-19. *Hispanic Journal of Behavioral Sciences, 42*(4), 498-514. https://doi.org/10.1177/0739986320959764

Kimmons, R., Miller, B. G., Amador, J., Desjardins, C. D. & Hall, C. (2015). Technology integration coursework and finding meaning in pre-service teachers' reflective practice. *Education Tech Research Development*. https://doi:10.1007/s11423-015-9394-5

Khamidi, A. & Hartoto, S. (2022). Management physical education learning model in the era of the covid-19 pandemic: A literature review. *Jurnal SPORTIF: Jurnal Penelitian Pembelajaran, 8*(1), 96-117. https://doi.org/10.29407/js_unpgri.v8i1.17802

Linnes, C., Ronzoni, G., Agrusa, J. & Lema, J. (2022). Emergency remote education and its impact on higher education: A temporary or permanent shift in instruction? *Educ. Sci., 12*, 721. https://doi.org/10.3390/educsci12100721

Marzano, A., Vegliante R. & De Angelis, M. (2015). *Quali-quantitative approch in educational research.* University of Salermo and University of Rome Tor Vergata, Italy.

Moreno-Ger, P., Burgos, D., & Torrente, J. (2009). Digital games in eLearning environments: Current uses and emerging trends. *Simulation & Gaming, 40*(5), 669-687.

Mupfiga, M., Mupfiga, P. & Zhou, T.G. (2017). Enhancing Teaching and Learning through the Use of Mobile Technologies in Zimbabwean Universities. *Journal of Systems Integration, 2,* 43-51. https://doi: 10.20470/jsi.v8i2.298

Neuwirth, L. S., Jovic, S. & Mukherji, B. R. (2021). Reimagining higher education during and post-COVID-19: Challenges and opportunities. *Journal of Adult and Continuing Education, 27*(2), 141-156. https://doi: 10.1177/1477971420947738

Rodríguez, M.L. & Pulido-Montes, C. (2022). Use of digital resources in higher education during COVID-19: A literature review. *Educ. Sci., 12*(612), 1-19. https://doi.org/10.3390/ educsci12090612

Roniel, O. & Diolanharliedh (2020*). Tiktok as a new trend in social media.* BRAINLY-Technology and Home Economics-Senior High School. https://brainly.ph/question/6167990

Sasere, O. B. & Sekitla D. M. (2020). Global perceptions of faculties on virtual programme delivery and assessment in higher education institutions during the 2020 COVID-19 Pandemic. *ERIC, International Journal of Higher Education, 9*(5),181-192. https://eric.ed.gov/?id=EJ1270557

Steinberg, C., Zühlke, M. & Jennett, F. (2019). Aesthetic education revised: a contribution to mobile learning in physical education. *Ger J Exerc Sport Res 2020, 50*, 92–101 https://doi.org/10.1007/s12662-019-00627-9

Whittle, R. J., Telford, A., & Benson, A. C. (2018). Teacher's perceptions of how they influence student academic performance in VCE Physical Education. *Australian Journal of Teacher Education, 43*(2). http://dx.doi.org/10.14221/ajte.2018v43n2.1