



Digital technology in physical education distance learning during pandemic: teachers' perspective

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Abstract: The aims of study to describe the utilization of information technology and telecommunications in Physical Education (PE) distance learning process during the covid-19 pandemic. This quantitative study conducted with a survey method. The subjects of this study were primary and secondary school PE teachers who were determined based on clusters of three regions/regions, namely: schools in urban, suburban, and rural areas in the Special Region of Yogyakarta with a total of 238 people. Data was collected through a questionnaire distributed to the primary and secondary school PE teachers online and offline. The data analysis applied is descriptive quantitative with percentages. The results of the study show that PE teachers apply hardware and software that already exist and are popular in Indonesia. PE teachers communicate with their students, especially WhatsApp, Email, Instagram, and Facebook, and also use social media applications in various ways. The utilization of the Google Classroom as a Learning Management System (LMS) is very dominant.

Keywords: technology, learning, teacher, physical education.

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INTRODUCTION

In an effort to prevent the spread of Covid-19, the Ministry of Education and Culture has instructed the implementation of distance learning in schools throughout Indonesia. In addition, efforts are also made for schools to practice hygiene and sanitation in schools (Surat Edaran Nomor 3 Tahun 2020). This is due to a call from the World Health Organization (WHO) to raise the status of Covid-19 as a global pandemic on March 11 (Kompas.com, March 12, 2020). Furthermore, the Ministry of Education and Culture decided to conduct distance learning at home as Education Policy Implementation for the Spread of Covid-19 during the Emergency Period (Surat Edaran Nomor 4 Tahun 2020). The decision emphasizes that the learning process is carried out at home via distance learning in order to provide students with a meaningful learning experience. Distance learning in particular requires the involvement of technology in its implementation.

Advantages in technology will greatly support the world of education, especially the implementation of distance learning. The Indonesian people have also adapted technology, as 30 million children and adolescents use the internet and digital media for communication. (Kemenkominfo, 2014). Technology has benefits in increasing knowledge and making it easier to access educational and learning resources (Alghamdi, 2014). Various studies have concluded that there is an increase in the utilization of digital media by children which can have a positive or negative effect. So that awerness through education is needed in its utilization, including for learning purpose (Putnam, 2000; Turkle, 2011; Bell, Bishop, and Przybylski, 2015; George and Odgers, 2015; and



Kardefelt-Winther, 2017). Adaptation to technology will enhance technological literacy to understand and use applications more wisely and adapted to their functions (Na'im, 2019).

The utilization of internet access with WIFI services and internet service providers to conduct distance learning. This is in accordance with the results of a survey conducted by the Association of Indonesian Internet Service Providers, internet users in Indonesia had almost reached 200 million users in the year 2019 to second quarter of 2020. In the second quarter of 2021, the number of Indonesian users reached 196.7 million, increased to 73.7% of the total recorded population of Indonesia 266.9 million. The internet and information services aimed at students are not constrained by space, time, or distance. Information services can be provided as a learning resource via the internet, as well as learning media that can be studied based on students' learning abilities. (Husaini, 2014). One way to keep up with the rapid development of science and technology was, always access *up to date informations* via the internet but it needs to be supported by infrastructure and human resources capabilities as providers, managers and users of information (Husaini, 2014).

Distance learning was learning process that emphasizes *self-study* (Munir, 2009: 20). Independent learning was organized in presenting learning materials, providing guidance to students, and supervising the learning process to ensure the success of the learning process. Distance Learning was also a teaching and learning process where teachers and students were in different locations or places (Lili, 2020: 7). Distance learning is the implementation of learning that was only carried out remotely to support the learning process that contains play activities that provide meaningful learning experiences without being burdened with completion requirements learning outcomes as stated in the curriculum (Kemendikbud, 2002: 2). The presence of digital technology that was currently developing will greatly help the implementation of distance learning more easily and effectively. Distance learning was a comprehensive learning model, one of which uses information and communication technology, such as *Computer-Based, Online, and Distance Learning*.

In the world of education, Information and Communication Technology (ICT) was growing so rapidly. Several educational research findings have succeeded in proving the usefulness of ICT as a tool in improving students' achievement (Andrea & Boos, 2004; Gary & O'Sullivan, 2003; Uwe, 2004). Other research findings shows that the utilization of "virtual *classroom*" approach, which is a combination of *website* and a *list server*, allows imitating real classroom events to great effect and improves message quality, which is difficult in conventional classrooms (Clarke and Cronje, 2002). Truell (2001) states that the *internet-assisted instruction* approach may have positive consequences in learning, especially having useful practical implications in a physical education setting. Tsangaridou and O'Sullivan (2003) found that knowledge of the relationship between teaching action theory and the theory applied in teaching practice can be done through *web-based learning*.

Distance learning was carried out by utilizing various applications in the network (online). Teachers, students, and school residents were required to take advantage of available information technology applications to keep distance learning running. Sending assignments via e-learning applications, giving assignments, online discussions, and reviewing the learning process were all examples of online learning interactions (Allo, 2020). Technological developments have a positive impact on the implementation of learning process (Keengwe & Georgina, 2012). The various research findings provide justification for maximizing the use of information and communication technology in distance learning, particularly in PE teaching and learning.

PE was one of the subjects in schools with a different learning process from other subjects. Emphasis on mastery of skills, knowledge, and attitude change in various activities carried out was a consequence of PE. Therefore, PE teachers in primary and secondary schools have duties and responsibilities in developing distance learning which needs to involve information and communication technology. This is also the basis that the involvement of technology in PJOK learning can help teachers convey various learning informations, so that the students can receive them well. However, the involvement of technology in PE learning is indeed not an easy thing to implement because of the uniqueness of the PE lesson. Therefore, we need a mapping and analysis of the extent to which technology was applied in distance learning for PE subjects, both in middle and elementary schools, especially throughout the Covid-19 pandemic.

The development of technology has been so massive that it needs to be utilized optimally in the world of education. There were demands for the implementation of distance learning due to the

pandemic, the demands for the utilization of technology in distance learning need to be fully anticipated by teachers, especially PE teachers, and the mapping of ICT utilization was not yet known among PJOK teachers. According to the preceding description, the research problem can be aimed at exploring the utilization of information technology, communication, and internet networks in distance learning of physical education, sports, and health subjects in schools.

METHOD

The descriptive analytic research method was chosen. Analytical descriptive was a method for describing or providing an overview of the object under study using data or samples collected as they are without analyzing and drawing conclusions applicable to the general public (Sugiono, 2015). In other words, analytical descriptive research begins with or focuses on problems as they exist when the research was conducted, and the research results were then processed and analyzed to draw conclusions. This analytical descriptive study applied a *cross sectional* research design that aims to describe the involvement of technology in teaching physical education through distance learning. In *cross-sectional* research, the measurement of the variables was carried out at the same time (Notoatmodjo, 2010).

Participants

This study included 238 Physical Education teachers from elementary, junior high, and senior high schools in Yogyakarta's Special Region (DIY) which covers the Yogyakarta City, suburban area was Sleman Regency, and rural area was Kulonprogo Regency. Table 1 shows the distribution of participants.

Table 1. Distribution of Participants

No	Education Level	Region/Region		
		City	Suburbs	Rural
1	Elementary School	31	26	29
2	Junior High School	25	22	27
3	Senior High School	25	29	24
	Total	81	77	78

Data collection

Data was collected by a questionnaire on the utilization of technology in physical education distance learning. The involvement of technology in physical education distance learning is measured based on information and communication technology that consists of a series of statements about the utilization of computer technology, multimedia, telecommunications, and internet networks. The instrument was compiled by the researcher and then distributed to respondents *online* through the *google form* application. The instrument lattice is as shown in table 2.

Table 2. Questionnaire Outline

Variable	Factor	Indicator	No. Items
Technology in Distance Learning	Information Technology	Input Device	1
		Output Device	2
		Storage Device	3
		Operating system	4
		Software/Program	5
	Telecommunications Technology	Hardware	6
		Social Media Apps	7
		Educational Applications (e-learning)	8
		Video Conferencing Apps	9
	Internet Network Technology	Connectivity	10
		Search Engine Apps	11
		Other frequently used apps	12

Data Analysis

The data analysed descriptively to identify the outcome by frequency and percentage technique. The findings of this research presented in the form of graphs with the percentage for a better understanding.

RESULTS AND DICUSSIONS

The most widely applied hardware for entering various data or information by PE teachers in distance learning was Netbook or laptop as much as 40%, then Personal Computer (PC) 21.4%, digital camera 19.6%, and scanner 10% (Figure 1). There is a tendency that teachers apply netbooks or laptops more to do physical education distance learning.

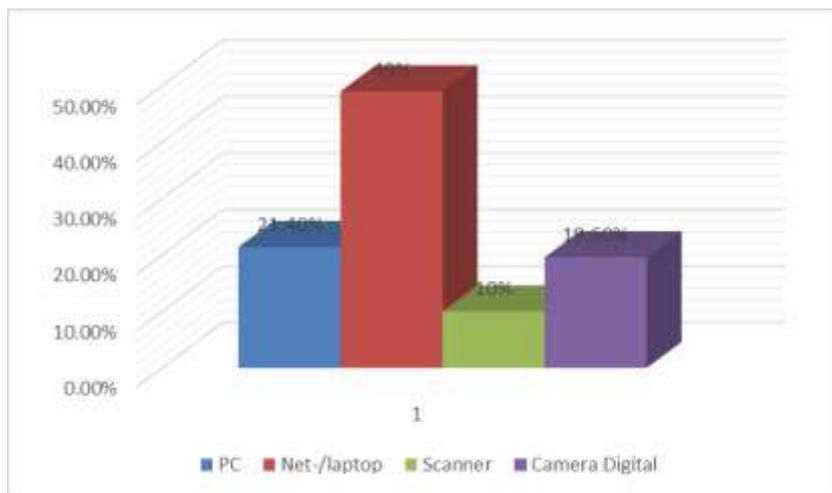


Figure 1. Hardware for input data/information applied in Distance Learning

Hardware applied for storing various data or information by PE teachers in distance learning from the most was Flashdisk as much as 43.8%, then Internal Harddisk 34%, External hard drive 17.6%, CD/DVD as much as 3.7 %, and 10% Memory Card. (Figure 2). There is a tendency that teacher’s utilization flashdisk more to storage various data information about physical education distance learning.

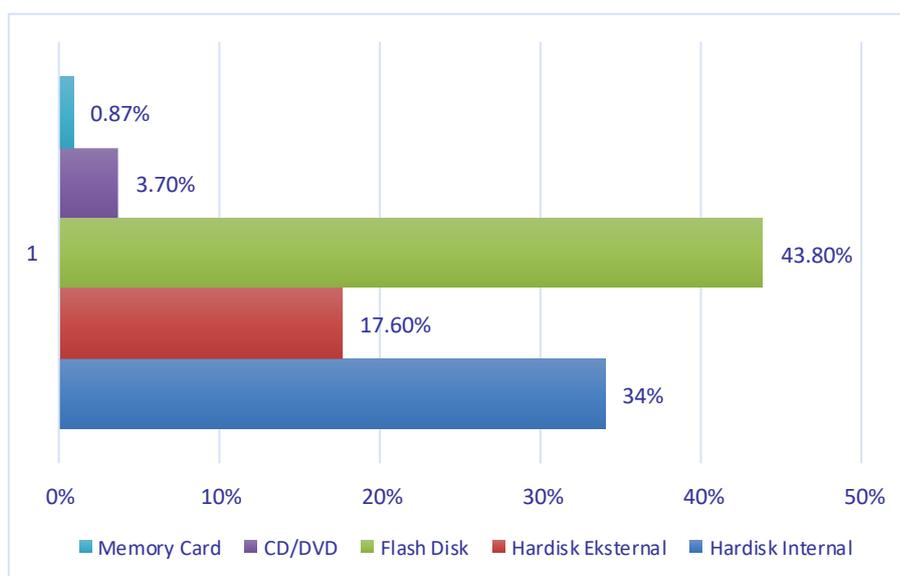


Figure 2. Hardware for storing data/information applied in Distance Learning

The operating system on computer applied by PE teachers in distance learning was Microsoft Windows as much as 97.5%, then Macintosh (Apple) 1.7%, and Linux 0.8%. (Figure 3). Microsoft Windows has become the favorite operating system among teachers in the implementation of distance learning in physical education.

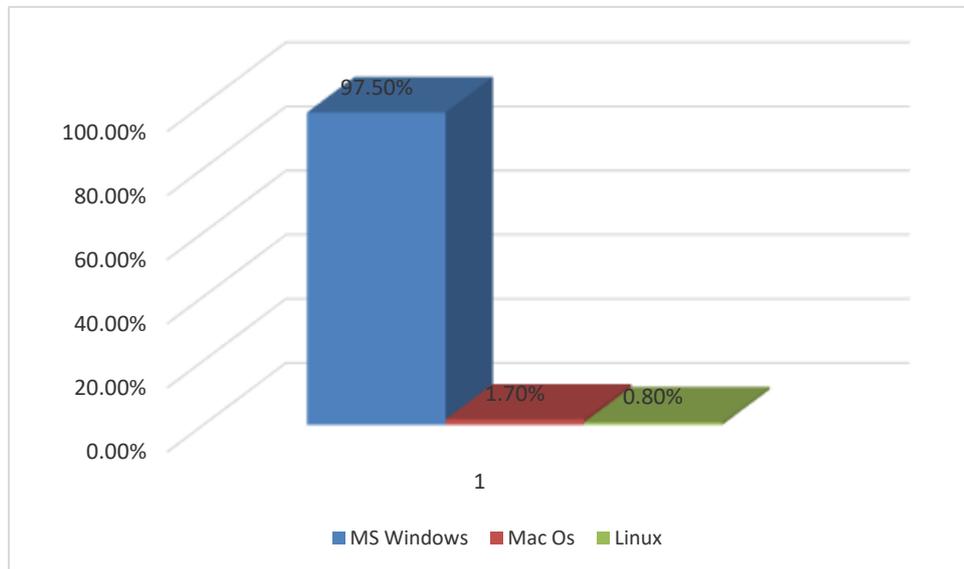


Figure 3. The computer operating system applied in PE Distance Learning

Software (*software*) on a computer device applied by PE teachers in distance learning from the most was Microsoft Word as much as 23.9%, and Microsoft PowerPoints 20.9%, 17.1% Microsoft Excel, Adobe PDF as much as 10.4%, Photoshop 10%, Movie Maker 9.6%, Corel 6.3%, and others as much as 1.8%. (Figure 4). The teachers in conducting physical education distance learning are more likely to use some microsoft office software, such as microsoft word, excel, and power points.

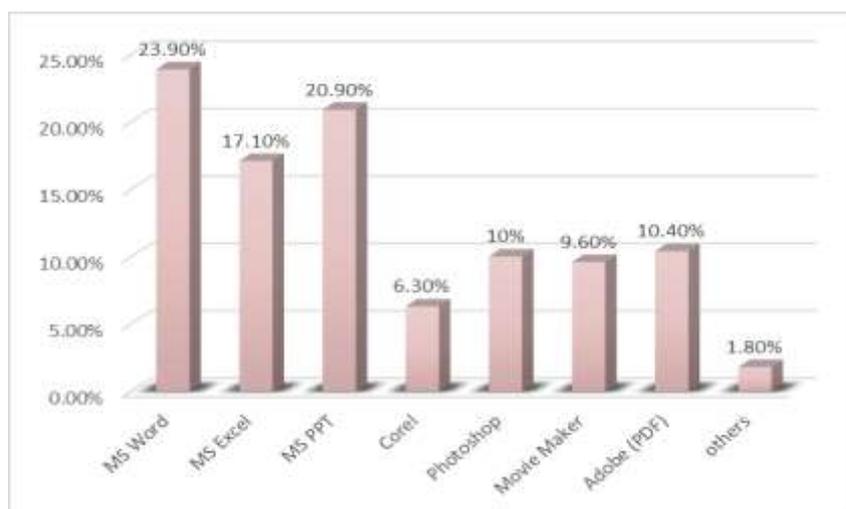


Figure 4. Computer software applied in PE Distance Learning

The communication hardware applied by PE teachers in distance learning from the most was Smartphone/iPhone as much as 63.2%, then Telephone 22.5%, Tablet/iPad 7.6%, PDA 3%, Television 1.5%, Radio 1.3%, and Handy Talky 0.9%. (Figure 5). Smartphones or iPhones were hardware that were more widely applied by teachers in communicating when carrying out physical education distance learning.

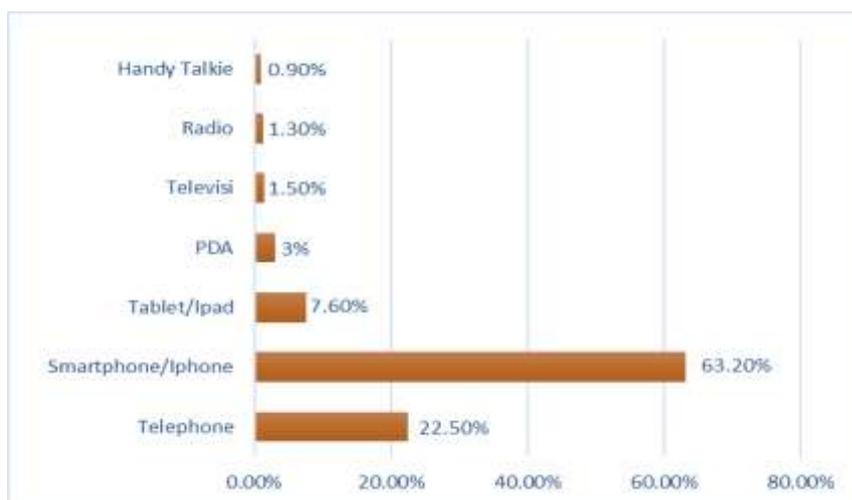


Figure 5. Devices for communication applied in PE Distance Learning

PE teachers in distance learning apply various social media applications. Sequentially the most widely applied social media applications were WhatsApp as much as 51.9%, then Email 28.5%, Instagram 11.8%, Facebook 5.7%, Twitter 1%, Telegram 0.6%, Tik tok 0.4%, and Line 0.2%. (Figure 6). WhatsApp was an effective social media used by teachers in communicating with students in physical education distance learning.

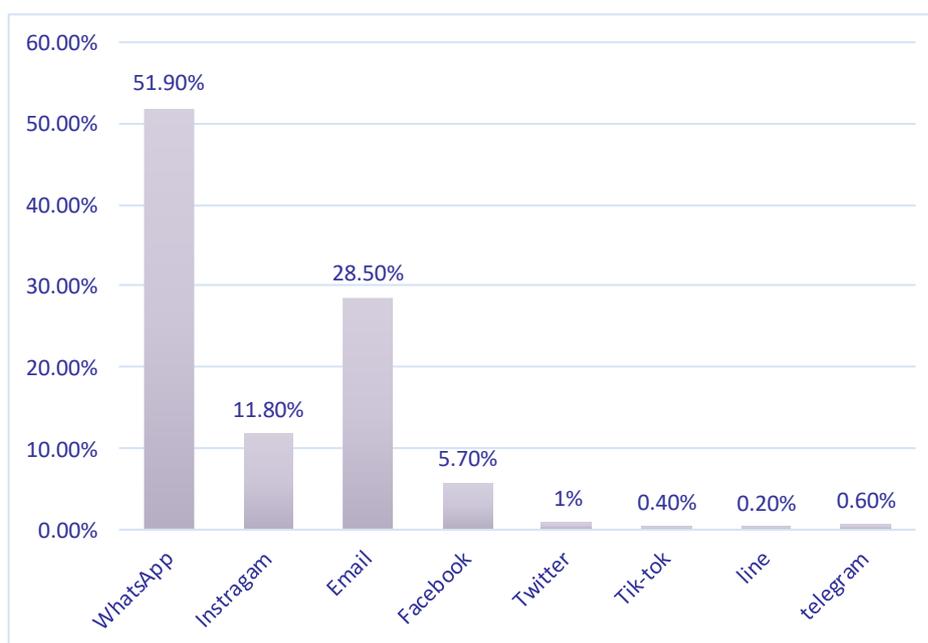


Figure 6. Social Media Applications applied in PE Distance Learning

Learning Management System (LMS) or e-learning was an educational application that can be used by teachers in the course of teaching and learning. Google Classroom was the LMS that was most widely applied by PE teachers, which is 72.7%. Next are Learning Houses as much as 9.6%, Teacher's Room 5.3%, Your School, 4.2%, Edmodo and Geschool 2.5%, Microsoft Learn 1.8%, and Moodle as much as 1.4%. (Figure 7). Teachers who have more technological skills utilization Google Classroom as an LMS in distance learning.

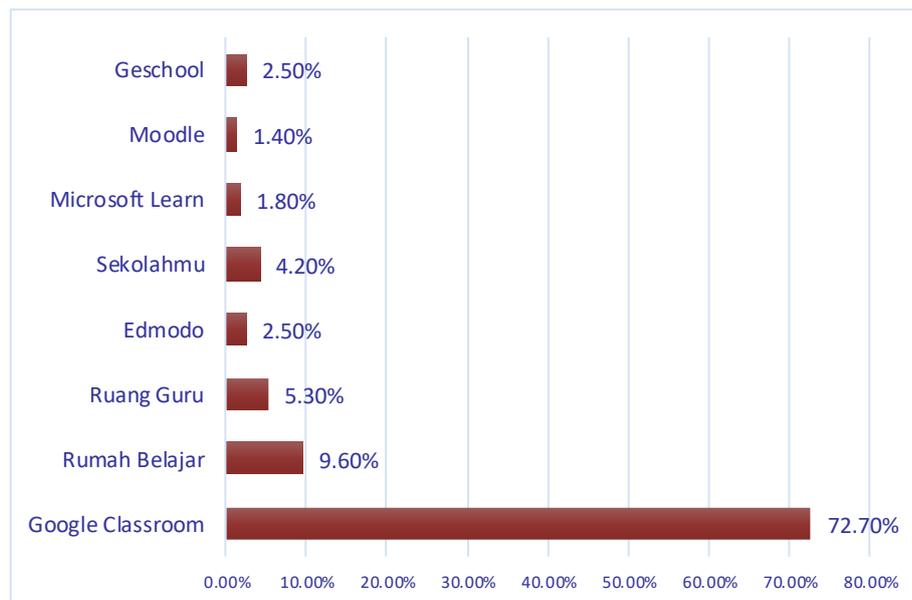


Figure 7. LMS applied in PE Distance Learning

Video conferencing is widely applied in distance learning to meet face-to-face virtually. There are various applications that are used by PE teachers in distance learning, from which the most are Zoom Meeting as much as 50.1%, then Google Meet Hangout 42.5%, Microsoft Teams 3.7%, WhatsApp Video Call 2.8%, and YouTube as much as 0.9%. (Figure 8). Zoom meeting has become a video conference media that was widely applied by physical education teachers when conducting synchronous distance learning.

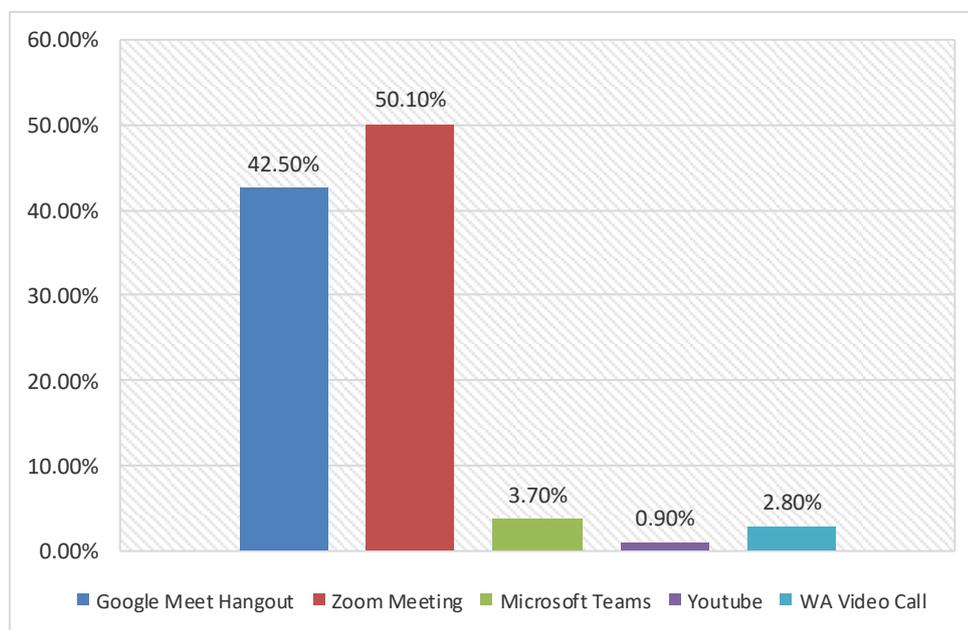


Figure 8. Video Conference application applied in PE Distance Learning

There were other applications also widely used by PE teachers in distance learning, namely YouTube as much as 29.1%, then Google Form 26.20%, Google Drive 22.2%, Google Image 13.2%, Google Translate 7.6%, and others 1.7%. (Figure 9). On many ways, many teachers use applications developed by the Google company in the process of implementing physical education distance learning.

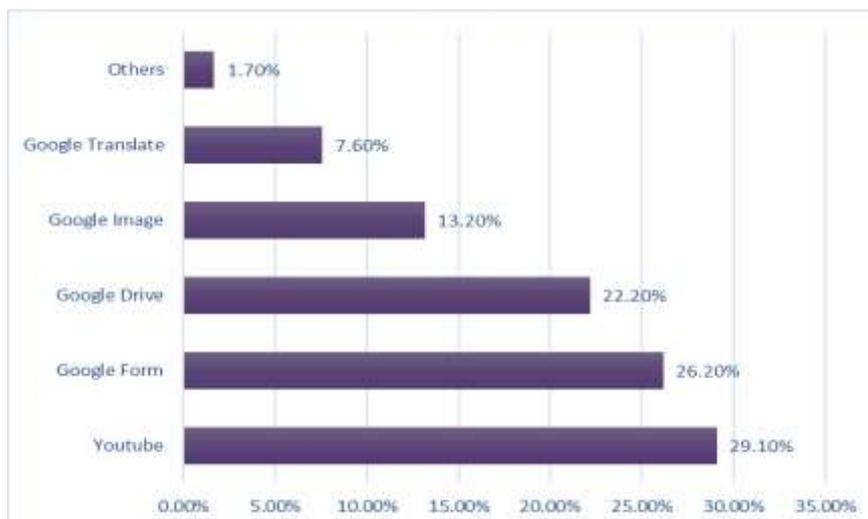


Figure 9. Other applications applied in PE Distance Learning

The world of education really needs the role of advances in information technology because it will get tremendous benefits. This extraordinary and widespread impact has given e-learning, distance, online, web-based, computer-based learning, and virtual class rooms were all terms used to describe a new color or face to the world's education system. The terminology all refers to the same concept, which is education based on information technology (Wahjono, 2015). Today's educational institutions will soon introduce and begin to use Information and Communication Technology (ICT) as a more modern learning platform. The use of information technology was one of the key factors that allows for the rapid transfer of knowledge to students and the nation's generation in general (Wahjono, 2015). In a more specific context, education policies, whether instituted by the government, local governments, or the community, must enable students to gain a broad understanding and mastery of cutting-edge technology. Information technology serves to reduce the gap in mastery of the latest technology, especially in the world of education.

The advancement of information technology-based education offers at least two benefits: it motivates the educational community (including teachers) to be more appreciative and proactive in maximizing the potential of education, and it provides broad opportunities for students to take advantage of every potential that can be obtained from an infinite number of sources (Wahjono, 2015). Distance learning involves the internet as it relates to anything delivered, enabled, or for explicit learning purposes, mediated by electronic technology (M. Samir Abou El-Seoud et al, 2014). Distance learning was also synonymous with the term e-learning which is applied in various perspectives including online and hybrid distance learning (Maltz et al, 2005). Further explained that e-learning refers to the achievement and utilization of knowledge which is mostly facilitated and distributed by means of information technology (Valentina Arkorful & Nelly Abaidoo, 2014).

The results of the study shows that PE teachers apply netbooks/laptops and smartphones more to access the internet and conduct distance learning. This is a slight discrepancy with the survey results of the Indonesian Internet Service Providers Association, which shows that 73.2% of respondents have never applied a PC computer to surf the internet, 63.1% of respondents have never accessed the internet from a laptop, and 95.4% of users have never applied a PC. Internet in Indonesia that accesses the virtual world via cell phones or cellphones. Because of advancements in information technology, it is now possible to communicate and exchange information regardless of location, time, or distance (Husaini, 2014). The rapid development of information technology was inextricably linked to the advancement of computer engineering. Computer and information technology advancements also have a positive impact on the field of education (Husaini, 2014). The use of computer networks and the internet as a medium for teaching and learning is the most influential application in the field of computer technology and information technology in the field of education.

Flashdisk was a hardware device that is widely applied by teachers to store various information or data about physical education distance learning. This is in accordance with the opinion that wireless-based storage systems are very important for the temporary and long-term preservation of

information and USB flash storage has become an alternative device for storing data with low power even though it still has a small capacity (O'Brien, Salyers, Striegel, and Poellabauer, 2008). It was also supported that flash storage technology requires low energy, low prices so that it can become an economical industry, and users can replace flash drives more easily (Mordvinova, Kunkel, Baun, Ludwig, & Kunze, 2009). The development of USB flash drives was currently so rapid in the midst of emerging other data storage technologies, resulting in changes to the design and high performance of flashdisk (Birrell, Isard, Thacker, Wobber, 2007).

The findings also indicate that Microsoft Windows is an operating system that was widely applied by teachers on their computer devices to carry out physical education distance learning. This is in line with a study which found that as many as 84.61% of lecturers at a university used Microsoft Windows as an operating system on their computer devices so that it had an impact on their students who also applied the same operating system (Muyu, Poluakan, and Yeremia, 2021). The researcher further revealed that the high utilization of Microsoft Windows among lecturers and students was due to the fact that it was easier to find applications and they were available free of charge because higher education institutions were subscribed (Muyu, Poluakan, and Yeremia., 2021). In addition, the results of this study were also supported by the opinion that there was an evolution in Windows technology that tends to continue to change towards perfection starting from the very beginning of MS-Dos to Windows 7 and will continue to develop along with user needs in terms of innovation (Kayani, Iqbal, Abrar, Ijaz, & Rabbani, 2010). This is reasonable because the main purpose of most utilization of operating systems was the efficiency of computer system software and hardware resources (Martinovic, Balen, and Cukic, 2012).

It was further disclosed that the Microsoft Windows operating system was the most widely applied for personal computers so that it meets the needs of all types of users of different computer systems. The results of the evaluation of various versions of the Microsoft Windows operating system also show an improvement in performance from various aspects and from time to time (Martinovic, Balen, and Cukic, 2012). Microsoft Office was one of Microsoft's products which is also widely applied for distance learning. Microsoft Office was a set of software that has many facilities in terms of email, managing agenda, contact management, video conferencing, editing, saving, and sharing documents so that it fits the needs of distance learning (Carutasu, & Pirnau, 2017). It was further explained that the utilization of Microsoft Office was in accordance with changes in pedagogical methods through technology, conducting paperless lessons, and using OneNote facilities from any device (Carutasu, & Pirnau, 2017). The utilization of microsoft office with the Internet will make it easier to manage efficient learning (Carutasu, & Pirnau, 2017).

Today, smartphones have become an important educational tool that facilitates the learning and teaching process applied by both students and teachers. A research result shows that overall lecturers allow to apply smartphones in almost all of their functions in learning so that lecturers consider it as an important necessity (Wali & Omaid, 2020). The conclusion was that the integration of smartphones as a technology can be adapted to the achievement of learning goals and reduce its negative impact (Wali & Omaid, 2020). The results of other studies show that most students support the utilization of smartphones in the teaching and learning process through designing appropriate policies and maximizing their functions for learning so that they can help students learn more optimally (Machmud, 2018). Distance learning during the pandemic has increased the role of social media applications as an effective learning medium for communicating between teachers and students. This is in line with the results of research which found that there is a good trend about the values of using social media in learning so that it was necessary to increase its utilization in universities (Taylor, King, and Nelson, 2012). In addition, a research result also suggests that the utilization of social media access in learning can improve the quality of education as a whole so it needs to be better managed to be useful and effective as an alternative approach (Kot and Meyer, 2018).

Learning Management Systems (LMS) was one of the digital technology tools that strongly supports distance learning in physical education. This is because LMS allows teachers to facilitate and model discussions, plan online activities, set learning goals, provide choices to students, and assist in problem solving with the decision-making process, thereby giving students their autonomy, enthusiasm, and motivation in learning. Bradley, 2020). The utilization of LMS by teachers is strongly supported by students because there were several advantages they get, namely: the closeness felt by students, peer references, easy to use, and perceived benefits so that student involvement in learning is

greater (Alturki and Aldraiweesh, 2021). In addition, a study showed that there was a significant difference between male and female students' perceptions of using LMS, so a continuous training program was needed for students to be able to maintain distance learning using LMS (Ajijola, Ogunlade, Aladesusi, and Olumorin, 2021).

The utilization of online video conferencing platforms by physical education teachers in distance learning was Google Meet and Zoom Meetings the most. This is supported by the results of a study which found that every online video conferencing platform has various features that are useful for teachers and students so that teachers must be able to carefully analyze all the features of each online video conferencing platform feature to choose the appropriate platform for students and their learning needs (Cavus and Sekyere-Asiedu, 2021). In a study also showed that teachers and students agree that video conferencing platforms are very helpful in distance learning, although around 66% of them feel unaffected in educational development but most of them become closer to the platform and about 24% of them feel an increase in academic performance (Del Rio-Chillce, Jara-Monge, and Andrade-Arenas, 2021). The obstacle faced is that there are still some teachers who experience psychological difficulties due to this change in learning. Therefore, a teacher can apply various learning resources and cutting-edge media that involve the internet to be able to present interesting, motivating, and inspiring learning (Anwar, Rachman, Purwanto, and Sudardiyono, 2020).

CONCLUSIONS

Utilization of Technology in Physical Education Distance Learning in Elementary and Secondary Schools includes information technology, telecommunications, and internet networks. PE teachers mostly apply hardware and software that already exist and were popular in Indonesia. PE teachers apply to communicate with their students by WhatsApp, Email, Instagram, and Facebook, also use other various social media applications in based on the requirement. PE teachers very dominantly apply the Google Classroom as Learning Management System (LMS) due to the user friendliness.

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