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ICT LITERACY AND ADOPTION OF P.E. TEACHERS: BASIS FOR INTERVENTION

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Abstract:
Despite all of the advantages of incorporating information and communication technology (ICT) into education, applying ICT to the subject of physical education (P.E.) remains a significant challenge for teachers due to the specific nature of the class: the motor aspect, constraints on space, time, and preparation, and so on. This study was conducted to determine the readiness of physical education teachers at the University of Mindanao for ICT- assisted instruction. It used a quantitative, descriptive approach using descriptive statistics to determine the level of ICT literacy and ICT adoption of physical education teachers in teaching and learning. Complete enumeration was used to select the respondents. An online survey was administered to 35 qualified teachers from all branches of the University. The instruments used were adapted and improved from two different research projects. Three experts validated the test questionnaire and rubric in the field with a very good descriptive result. The data gathered were tallied and treated using the following statistical tools: the mean, standard deviation, and Pearson's r. Overall, results show that teachers' ICT literacy and ICT adoption were high. The study further indicates that physical education teachers are more likely to use ICT applications and resources such as the internet, multimedia computers, projector systems, PowerPoint presentations, or word processor programs, especially during teaching and learning sessions. Further, the researcher found that ICT literacy is positively correlated with ICT adoption. Implications of the study results were presented.

Keywords: ICT literacy, ICT adoption, physical education teachers, correlation, University of Mindanao

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1. Introduction

Despite all of the advantages of incorporating information and communication technology (ICT) into education (Karsenti & Lira, 2011), applying ICT to the subject of physical education (P.E.) remains a significant challenge for teachers due to the specific nature of the class: the importance of the motor aspect, constraints on space, time, and preparation, and so on (Villalba & González, 2016). Amid this, teachers use ICT in P.E. schools, such as laptops, e-mail, and the Internet (Gibbone *et al.*, 2010), pedometers, heart rate monitors, telephones, tablets, reality simulators, exergames (Zhu & Dragon, 2016), and smartphone apps related to physical activity and sport (Pyle & Esslinger, 2014).

However, some scholars have discussed the challenges and obstacles that physical education teachers encounter in adopting ICT into physical education courses and some strategies for overcoming them (Pyle & Esslinger, 2014; Shan Fu, 2013). The use of technology in P.E. is usually slow to gain acceptance (Gibbone, Rukavina & Silverman, 2010). Several researches have indicated that teachers' lack of knowledge and skills have become primary factors in the failure of a computer technology integration program in the institution (Mouza, 2003; Young, 2004). Many teachers can only operate basic computer programs, although the computers they use can provide them with more advanced facilities (Doherty & Orlofsky, 2001). The lack of time is also often considered as a problem by teachers in their technology into teaching and learning (Grainger & Tolhurst, 2005). They are often loaded with too many teaching hours or other activities outside their teaching responsibility, so they hardly have time to plan, prepare and develop their technolog into teaching and learning (Kathriner, 2007). In fact, preparing to teach with technology, Kathriner (2007) argues, usually requires a longer time than teaching without technology. Moreover, in a study conducted in Turkey by Asan (2003), it was discovered that many teachers did not use computers. According to the findings, just 10% of the study participants were ICT literate.

Moreover, the shortage of qualified teachers who are literate or fluent in ICT is a major problem for the educational system. Teachers who are ICT literate are valuable change agents because they can foster a positive attitude toward using computers and information technology (Humes, 2003). Consequently, the teacher answers how ICTs are used, regardless of the quantity or quality of technology available in classrooms. As a result, teachers must be knowledgeable about technology and have a positive attitude (Kadel, 2005). Hence, a school can have ICT hardware and software, but whether or not it is used effectively is up to the teachers. The teachers' values will determine their experiences, their expertise levels, attitudes toward ICT, educational applications, planned results, and teaching and learning methods (Thomas & Stratton, 2006). Furthermore, Kirschner and Woperies (2003) emphasized some main ICT skills teachers must possess. Competency in using ICT for personal use, mastery of a variety of educational paradigms that use ICT, using ICT as a mind tool, using ICT as a teaching tool, mastering a variety of assessment paradigms that use ICT, and understanding the policy aspects of using ICT for teaching and learning are among them.

Information and communication technologies (ICTs) have become the most basic building component of modern industrial civilization in a very short time. Many countries increasingly value mastering information technology and comprehending basic skills and ideas in ICT (Daniels, 2002; Rampersad, 2011). ICT has been rising at an astounding rate in instruction among teachers. ICT application has become a crucial aspect of the learning process for university teachers both outside and inside the classroom setting in the education sector. During the previous two decades, the government and other stakeholders in the education sector, such as university administrators and researchers, have invested millions of dollars in ICT adoption in the education system. Most universities that have completely embraced ICT have seen significant progress in terms of using ICT to improve learning techniques, teaching, research, and development (Lawrence, 2015).

Research shows that the success of technology use in educational settings largely depends on the level of adoption of teachers (Albirini, 2006; Baylor & Ritchie, 2002). Teachers' challenges are considered a major predictor of new technologies in educational settings (Albirini, 2006). Thus, their adoption of computers can play an important role in accepting and actual use of ICT. In the same view, research on the adoption of technology in education has mostly focused on determining how digital technology has become integrated into schools and its issues for teaching and learning (Voogt & Knezek, 2008).

To develop their confidence in technology, teachers must be confident and knowledgeable in using a variety of ICT resources. ICT could not be used for instructional delivery without teachers' competency and mastery skills in ICT incorporation that are relevant to their needs. Teachers should have a variety of technological and communication skills in this regard, including the use of chat rooms, word processing skills, web page authoring, and the use of various ICT resources such as File Transfer Protocol (FTP), compress and decompress of data, e.g., Win zip, and so on (Barker, 2002; Jones & Preece, 2006). In the same view, one of the key reasons teachers do not use technology in their classrooms is a lack of proper preparation and experience. This harms teachers' attitudes toward computers and technology. Teachers can also not use computers due to a lack of faith (Kumar & Kumar, 2003).

This study is anchored on the viewpoint of Santos and Pedro (2012). He stated that ICT-training, as one of the forms of teachers' continuous professional development, is essential for preparing teachers to take full advantage of ICT in their classes because it contributes to the development of more positive attitudes regarding teachers' ability to efficiently handle technologies for educational purposes.

This is supported by Wozney, Venkatesh and Abrami (2006), who identified technology-related training as a key factor in increasing teachers' level of ICT literacy and ICT adoption in teaching and learning.

The technology acceptance model (TAM), the theory of reasoned action (TRA), and the diffusion of information (DOI) theory were used as the theoretical framework for this study since they provided a clearer viewpoint on the research direction on physical education teachers' underutilization of ICT. Furthermore, the theories aid in investigative research on ICT literacy, resulting in various adoption standards that can be used to

evaluate the successful use of ICT. TAM and TRA are essential in this study when it comes to the motivations for believing in and accepting technology in using electronic resources, thereby improving ICT literacy abilities. DOI also emphasizes the importance of technology adoption and awareness of physical education teachers on ICT literacy and adoption in teaching and learning. The research examines technology adoption in school teachers, identifying different levels of adoption ranging from recognition of a technology's existence to learning some basic elements, imagining specific tasks where the technology might be useful, and incorporating it into teaching or the curriculum. Christensen and Knezek (2001) refer to these multiple degrees as "stages of technology adoption".

According to teachers' perspectives, a lack of time to prepare and implement technology in teaching and learning is a significant barrier to fully adopting ICT into the P.E. curriculum. Configuring said technology, learning to use it, and planning and understanding how to incorporate it into one's teaching-learning practice in a relevant, instructional manner take time (Almekhlafi & Almeqdadi, 2010; Legrain, Grillet, Gernigon & Lafreniere, 2015). Another major challenge is the amount of time required to train teachers. A lack of ICT education in schools that train teachers was found to be an obstacle to the use of ICT in the classroom (Cuckle & Clarke, 2002; Yildirim, 2007). Along these lines, there was a strong need for training to learn different and unique teaching styles and thus apply ICT in teaching physical education; this was needed if the teachers were fully dedicated and wanted to be competent in this field (Thomas & Stratton, 2006). In the Philippine context, Kubota *et al.* (2018) annotated the following results. It was thematically divided into the following themes of analysis: infrastructures, human resources, and financial resources. Firstly, for infrastructure status, it was emphasized in the study that the computers were not linked to the internet and were not being used to their full capacity. Even so, the power source in the country was unreliable, and the fluctuating supply of energy was unfavorable to the currently limited computer facilities. Second, it was discovered in Human Resources that there is no qualified workforce capable of performing simple computer repairs. Teachers were found to have poor computing skills and an understanding of software and hardware. This is confirmed by the findings of Caluza *et al.* (2017), who found that most teachers they evaluated had only basic ICT skills and needed to improve. On the same note, due to their (teachers') busy schedules, there is no technical support personnel to maintain the functionality and usability of computers, and teachers were given very little instruction. Thirdly, in terms of budgetary challenges and financial resource status, Kubota *et al.* (2018) revealed that there was no budget for computer repair. Despite the availability of an internet signal in the town, there was no budget for internet service provision.

In the local perspective, Surigao del Sur in particular, the study of Daling (2018) revealed that there were inconsistencies in attendance at each ICT training due to scheduling conflicts, such as school activities that needed to be completed and complied with and workshops or pieces of training that needed to be attended in the same schedule as ICT training. Teachers were not interested in learning ICT because they discovered that some ICT skills did not apply to their classrooms, such as Microsoft Excel, Microsoft

Word, and PowerPoint presentations, which a physical education teacher was not likely to use. Some old-school teachers were not interested in learning ICT because they found it challenging to adapt the ICT to their classrooms.

In the works of Ghavifekr *et al.* (2014) identified two key factors relating to the readiness of teachers to ICT-assisted instruction which are as follows:

1) teacher ICT literacy or basic ICT skills and
2) teachers' challenges towards ICT adoption for teaching and learning.

The related literature supported Ghavifekr *et al.*'s study, which suggests teachers' readiness, knowledge, and skill level as major challenges for teachers to adapt and make effective use of ICT (Juniu & Shonfeld, 2013; Singh & Chan, 2014; Lucena *et al.*, 2019). ICT readiness and application have become crucial aspects of the learning process for university teachers both outside and inside the classroom setting in the education sector. During the previous two decades, the government and other stakeholders in the education sector, such as university administrators and researchers, have invested millions of dollars in ICT adoption in the education system. Most universities that have completely embraced ICT have seen significant progress in terms of using ICT to improve learning techniques, teaching, research, and development (Lawrence, 2015). Moreover, one of the significant prerequisites for quality ICT integration in teaching physical education is the teacher's personality, i.e., his knowledge and skills, willingness, and desire to improve the lessons by bringing physical education to actual settings (Wyant & Baek, 2018).

Furthermore, the use of technology in the educational system has triggered significant changes in education in recent years. This has enabled changes in educational practices, increasing the encouragement and availability of a wide variety of tools for techno-pedagogy (Escobar *et al.*, 2011). Based on the prevailing problematic situations, the researcher was prompted to conduct a study on the relationship between teachers' ICT literacy and ICT adoption in teaching physical education and investigate teachers' readiness for ICT-assisted instruction in teaching physical education. The optimum goal of the study was to determine the readiness of teachers in ICT-assisted instruction to teach physical education.

More explicitly, the study was conducted to seek answers to the following questions:

1) What is the level of teacher's ICT literacy in terms of; ICT skills and Knowledge and Instructional tools and materials used?
2) What is the level of teacher's ICT adoption in terms of; Awareness, Learning of the process, understanding and application of the process, Familiarity and confidence, Adaptation to other contexts, and Creative application to new contexts?
3) Is there a significant relationship between teachers' ICT literacy and ICT adoption in physical education?
4) Based on the study findings, what intervention program is proposed? The null hypothesis was formulated and treated at a 0.05 level of significance.

There is no significant relationship between the level of teacher ICT literacy and ICT adoption in teaching physical education. The findings of the study may be beneficial

to the School Administrators. The results of this study may encourage school administrators to conduct school-based in-service training for teachers not only on computer literacy but also on the integration and use of ICT into the teaching and learning process for Physical Education teachers. The study's findings will identify the causes of the readiness, and the contrary, of the teachers on ICT-assisted instruction in physical education. The results will serve as a basis for a necessary intervention program for teachers on ICT- assisted instructions in physical education. And, to the Learners. The study encourages the use of ICT in physical education instruction, thus catering to learners' interest in using technology in learning essential physical education concepts.

2. Method

This chapter describes how the research process was carried out. The presentation was specifically confined to the participants, instrument, design, and procedure.

2.1 Participants

The respondents of the study were the 35 qualified P.E. teachers, both full-time and part-time, in all branches of the University of Mindanao, including Main Campus, Tagum, Panabo, Peñaplata, Digos, and Bansalan of the College of Education- P.E. department. They were determined through a complete enumeration technique, whereby responses from or about each of the population members were obtained. It provides a true measure of the population, and detailed information about small sub-groups within the population is more likely to be available. This study includes all the physical education teachers, both part-time, in-house or with employers outside, and full-time, regular teachers. Hence, the study excludes the teachers who do not have faculty loads for S.Y. 2021–2022.

2.2 Materials/ Instruments

A survey questionnaire was used to gather the data for this study. This was adapted from the two different research projects. Ghavifekr *et al.* (2014) discuss the stages of teaching and learning with ICT tools and Christensen and Knezek (2001) on the technology adoption scale. Both instruments were adapted and validated by three (3) experts in the field and distributed among P.E. teachers.

The questionnaire consists of 2 sections. The first section is on the ICT literacy of P.E. teachers. The second section referred to the adoption of ICT in the teaching-learning process. As for the scale use, the questionnaire adopted a five-point Likert scale format to assess teachers' responses for each related section (1- strongly disagree, 2- disagree, 3- neutral, 4- agree, and 5- strongly agree).

In evaluating the ICT literacy of P.E. teachers, the following scales were employed:

Range of Means	Level	Interpretation
4.50 - 5.00	Very High	It indicates that the teacher's ability to integrate ICT-assisted instruction is manifested at all times.
3.50 - 4.49	High	It indicates that the teacher's ability to integrate ICT-assisted instruction is manifested oftentimes.
2.50 - 3.49	Moderate	It indicates that the teacher's ability to integrate ICT-assisted instruction is manifested sometimes.
1.50 - 2.49	Low	It indicates that the teacher's ability to integrate ICT-assisted instruction is manifested rarely.
1.00 - 1.49	Very Low	It indicates that the teacher's ability to integrate ICT-assisted instruction is never manifested.

In assessing the ICT adoption of P.E. teachers, the following scale was utilized:

Range of Means	Level	Interpretation
4.50 - 5.00	Very High	It indicates that the teacher's ability to adopt ICT-assisted instruction is manifested at all times.
3.50 - 4.49	High	It indicates that the teacher's ability to adopt ICT-assisted instruction is manifested oftentimes.
2.50 - 3.49	Moderate	It indicates that the teacher's ability to adopt ICT-assisted instruction is manifested sometimes.
1.50 - 2.49	Low	It indicates that the teacher's ability to adopt ICT-assisted instruction is manifested rarely.
1.00 - 1.49	Very Low	It indicates that the teacher's ability to adopt ICT-assisted instruction is never manifested.

3. Design and Procedure

A descriptive survey method will be used in this study. In this method, the present condition will be focused on. The descriptive study provides facts on which scientific judgments may be based. It provides essential knowledge about the nature of objects and persons. It also plays a large part in developing instruments of many things, instruments employed in all types of quantitative research as data-gathering instruments (Calmorin & Calmorin, 2007). The descriptive survey method is appropriate for the present investigation because it deals with the description of teachers' readiness for ICT-assisted instruction in P.E.

After the approval from the University's Research Center, researchers sent a letter to conduct a study to the heads of the departments in all branches of the University of Mindanao through e-mail, including; Main Campus, Tagum, Panabo, Peñaplata, Digos, and Bansalan of the College of Education- P.E. department. Then, the researcher distributed the online survey questionnaire to all P.E. teachers, both full-time and part-time, in all branches of the University of Mindanao. The distribution was handled by the researchers. At the same time, the survey questionnaires were sent via e-mail using Google Forms. When the online survey questionnaire was sent out, the participants had two days and a week to complete the online survey questionnaire. Afterwhich, the

researcher collated the data. The instrument was collated, tallied, and subjected to statistical analysis.

The data gathered through survey questionnaires were tallied and treated using the following statistical tools:

- **Mean.** This tool was used to determine the respondents' level of readiness for ICT-assisted instructions in physical education
- **Standard Deviation.** This tool was used to determine how spread-out numbers are.
- **Pearson r.** This was used to determine the significant relationship between teacher ICT literacy and ICT adoption in teaching and learning.

3. Results and Discussion

This chapter presents the result of the study. It provides the results, analyses, and interpretations in textual and tabular forms. Implications are also discussed based on the statistically treated data. The following topics are also discussed in this sequence: Level of ICT literacy of P.E. teachers, level of ICT adoption, the correlation between ICT literacy and ICT adoption, and the proposed intervention.

3.1 Level of ICT Literacy of P.E. Teachers

Table 1.1 shows teachers' ICT skills and knowledge. The data reveal that the overall mean of 4.18, which is high, and a standard deviation of 0.503, indicates that the teacher's skills and Knowledge of ICT are manifested often. The item with the highest mean is on *I use the internet for my personal use,* with 4.77 or very high and a standard deviation of 0.426. This means that the teacher's skills and knowledge of ICT are manifested. Furthermore, Kirschner and Woperies (2003) emphasized some main ICT skills teachers must possess. One of these competencies is using ICT for personal use. Teachers nowadays have a variety of ways to acquire ICT; some of them use the Internet for their consumption.

The rest of the items described as very high are: *I use the computer to prepare lesson plans* with a mean rating of 4.74; *I use the computer in my classroom and my online class* with a mean rating of 4.74; *I look for the latest additional information through the internet* with a mean rating of 4.71; *I can create teaching aids with the use of a computer* with a mean rating of 4.69; *I search teaching aids from the internet* with a mean rating of 4.57, and *I know about computer and its functions* with a mean rating of 4.54. It indicates that the teacher's skills and Knowledge of ICT are manifested. Teachers are knowledgeable in preparing lesson plans, instructional aids, and additional information using ICT; they also use ICT in their online classes to enhance teaching and learning.

In contrast, the items with the lowest mean ratings with moderate levels are: *I can construct a learning website* with a mean rating of 3.26, and *I install software on my own* with a mean rating of 3.31. This means that teachers' skills and knowledge in creating a learning website using ICT are sometimes manifested.

The item *I repair my computer* obtains the lowest mean rating of 2.74 or moderate with a standard deviation of 1.12. This signifies that the teacher's skills and ICT

knowledge are sometimes manifested. Some teachers have no idea how to repair their own computers or laptops, believing that they cannot repair the said technology if it is not functioning sometimes.

Teachers were found to have poor computing skills and an understanding of software and hardware. This is confirmed by the findings of Caluza *et al.* (2017), who found that most teachers they evaluated had only basic ICT skills and needed to improve. On the same note, due to their (teachers') busy schedules, there is no technical support personnel to maintain the functionality and usability of computers, and teachers were given very little instruction.

This confirms the study of Asan (2003). It was discovered that just 10% of the participants in the study were computer literate. The majority of teachers lacked a clear understanding of computer literacy, including repairing their own computers. The study results support the perspective of Yusuf (2005) that teachers are not proficient in simple computer operations and generic applications.

Table 1.1: ICT Skills and Knowledge

Item Statement As a teacher…	**Mean**	**SD**	**Interpretation**
1. I know about computers and their functions.	4.54	0.701	Very High
2. I repair my own computer	2.74	1.12	Moderate
3. I install software on my own.	3.31	1.207	Moderate
4. I search for teaching aids on the internet.	4.57	0.655	Very High
5. I use the computer to prepare lesson plans.	4.74	0.561	Very High
6. I can create teaching aids with the use of a computer.	4.69	0.583	Very High
7. I can construct a learning website.	3.26	1.172	Moderate
8. I prepare notes for my students using the internet.	4.43	0.698	High
9. I find questions for my students on the internet.	3.91	0.951	High
10. I use the computer in my classroom and my online class.	4.74	0.611	Very High
11. I look for the latest additional information through the internet.	4.71	0.519	Very High
12. I use the internet in the computer lab with my students.	3.66	1.305	High
13. I teach my students how to find information on the internet.	4.46	0.561	High
14. I use the internet for my personal use.	4.77	0.426	Very High
Overall Rating	**4.18**	**0.503**	**High**

The table 1.2 reveal that the overall mean is 4.05, which is high and has a standard deviation of 0.597. This means that the teacher's ability to integrate ICT-assisted instruction is often manifested. The items with the highest mean ratings are in teaching; I employ the PowerPoint presentation and e-mail with 4.57 or very high and a standard deviation of 0.815 for PowerPoint presentation and 0.884 for E-mails. It indicates that the teacher's ability to integrate ICT-assisted instruction is manifested at all times.

The rest of the items described as very high are: *In teaching, I employ the Word-processing tools* with a mean rating of 4.54, and *in teaching, I employ the Video materials* with a mean rating of 4.51. This means that teachers' ability to integrate ICT-assisted instructions is manifested at all times. Teachers are knowledgeable in employing word processing tools since this was a minimum requirement in preparing a lesson.

In contrast, the items with the lowest mean ratings with moderate levels are: *In teaching, I employ the television* with a mean rating of 3.46, and *in teaching, I employ the slide projector* with a mean rating of 3.31. Some physical education teachers do not use television in their instructions since there are available video materials that will enhance the teaching and learning process.

For the item *in teaching, I employ the CD ROMS,* which obtains the lowest mean rating of 2.97 or moderate and a standard deviation of 1.071. This indicates that the teacher's ability to integrate ICT-assisted instruction is sometimes manifested. Some physical education teachers did not employ CD ROMs because of the readily available video materials on the internet.

This confirms the study of Barker (2002), Jones and Preece (2006) that teachers should have a variety of technological and communication skills in this regard, including the use of chat rooms, word processing skills, web page authoring, and the use of various ICT resources such as File Transfer Protocol (FTP), compress and decompress of data, e.g., Win zip, CD ROMS, television and so on.

Table 1.2: Instructional Tools and Materials Usage

Item Statement In teaching, I employ the…	**Mean**	**SD**	**Interpretation**
1. Blackboard LMS	4.29	1.1	High
2. Overhead projector	3.51	1.337	High
3. Document camera	3.83	1.15	High
4. Multimedia camera	4.03	0.985	High
5. Internet/ web environment	4.43	0.739	High
6. Television	3.46	1.12	Moderate
7. Video materials	4.51	0.702	Very High
8. Slide projector	3.31	1.255	Moderate
9. Printed/Online materials (journals, eBooks)	4.29	0.825	High
10. PowerPoint presentation	4.57	0.815	Very High
11. CD ROMs	2.97	1.071	Moderate
12. Video conference	4.31	0.963	High
13. Word-processing tools	4.54	0.741	Very High
14. Spreadsheets	4.11	0.932	High
15. Simulation tools	4.03	0.923	High
16. E-mails	4.57	0.884	Very High
Overall Rating	**4.05**	**0.597**	**High Level of ICT Adoption**

Table 1.2 shows the teacher's adoption of ICT for teaching and learning. The data reveal that the overall mean is 3.66, which is high, and a standard deviation of 0.589. It indicates that the teacher's ability to adopt ICT-assisted instruction is manifested often. The item with the highest mean rating is on *Level 6: I can apply what I know about technology in the classroom. I can use it as an instructional tool and integrate it into the curriculum* with 4.63 or very high and a standard deviation of 0.646. It indicates that the teacher's ability to adopt ICT-assisted instruction is manifested at all times. Some physical education teachers

attain a high level of ICT adoption. This implies that the teachers believe that computers and other ICT media are useful and have better results when used in their teaching.

The rest of the items described as high are *Level 5: I think about the computer as a tool to help me and am no longer concerned about it as technology. I can use it with many applications and software and as an instructional aide* with a mean rating of 4.49. *Level 4: I am gaining confidence when using the computer for specific tasks. I am starting to feel comfortable using the computer*, with a mean rating of 4.11. *Level 3: I am beginning to understand using technology and can think of specific tasks for which it might be useful*, with a mean rating of 3.77.

In contrast, the lowest mean rating with a moderate level is on *Level 2: I am currently trying to learn the basics. I am often frustrated using computers. I lack confidence when using computers*, with a mean rating of 2.57. Some physical education teachers are currently trying to learn the basic components of computers and the internet since some of them are not using it in their classes.

The item, level 1: I am aware that technology exists but have not used it. Perhaps I'm even avoiding it obtains the lowest mean rating of 2.4, which is low, and a standard deviation of 1.288. This indicates that the teacher's ability to adopt ICT-assisted instruction is rarely manifested. These results show that some physical education teachers are aware of technology but do not use it because they are not well trained about it, and they are used to being in a traditional setup.

The results confirm the study of Almekhlafi and Almeqdadi (2010) and Legrain, Grillet, Gernigon, and Lafreniere (2015) that teachers' lack of time is a significant barrier to fully adopting the use of ICT in the P.E. curriculum. Some teachers are fully aware of the technology but sometimes avoid using and integrating it in their classes because of the concept of learning to use ICT and planning and understanding how to incorporate it into one's teaching-learning practice in a relevant, instructional manner takes time.

The results of the analysis support the vision and leadership of Grainger and Tolhurst (2005), who state that another potential challenge is teachers' lack of confidence in their ability to use more ICT in the classroom. More so, teachers were not interested in learning ICT because they discovered that some ICT skills did not apply to their classrooms, such as Microsoft Excel, Microsoft Word, and PowerPoint presentations, which a physical education teacher was not likely to use. Some old-school teachers were not interested in learning ICT because they found it challenging to adapt the ICT to their classrooms.

Table 3: Level of Teacher's ICT Adoption

Item Statement	Mean	SD	Interpretation
Level 1: I am aware that technology exists but have not used it. Perhaps I'm even avoiding it.	2.4	1.288	Low
Level 2: I am currently trying to learn the basics. I am often frustrated using computers. I lack confidence when using computers.	2.57	1.17	Moderate
Level 3: I am beginning to understand the process of using technology and can think of specific tasks for which it might be useful.	3.77	1.114	High
Level 4: I am gaining confidence when using the computer for specific tasks. I am starting to feel comfortable using the computer.	4.11	1.105	High
Level 5: I think about the computer as a tool to help me and am no longer concerned about it as technology. I can use it with many applications and software and as an instructional aide.	4.49	0.742	High
Level 6: I can apply what I know about technology in the classroom. I can use it as an instructional tool and integrate it into the curriculum.	4.63	0.646	Very High
Overall Rating	**3.66**	**0.589**	**High**

3.2 Correlation between ICT Literacy and ICT Adoption of P.E. Teachers in Teaching Physical Education

One important purpose of this study is to investigate the correlation between teachers' ICT literacy and ICT adoption in teaching physical education.

The data analysis in Table 3 shows the computed r-value and p-value of each indicator. Exploring the details of the data, adaptation to other contexts was a moderate positive correlation and statistically significant to teachers' knowledge and skills in ICT with a computed r-value of 0.584 and p-value of 0. Along with the data, Adaptation to other Contexts has a weak positive correlation and is statistically significant to ICT for instruction with a computed r-value of 0.381 and p-value of 0.024. This means that when the teacher has a remarkably high level of adaptation to other contexts, his/ her knowledge and ICT skills will be affected. In the same way, when the teacher has a remarkably high level of adaptation to other contexts, his/ her ICT instruction will be affected.

Furthermore, Creative Application to New Contexts had a strong positive correlation and was statistically significant to teachers' Knowledge and skills in ICT with a computed r-value of 0.686 and p-value of 0. Also, Creative Application to New Contexts was a moderate positive correlation and was statistically significant to ICT for instruction with a computed r-value of 0.487 and p-value of 0.003. The finding implies that when the teacher has a high level of creative application to new contexts, his/ her knowledge and skills in ICT will be affected. In addition, when the teacher has a high level of creative application to new contexts, his/ her ICT instruction will be affected.

This confirms the theory of Santos & Pedro (2012). He stated that ICT training, as one of the forms of teachers' continuous professional development, is essential for preparing teachers to take full advantage of ICT in their classes because it contributes to

the development of more positive attitudes regarding teachers' ability to efficiently handle technologies for educational purposes.

Table 3: Significance of the Relationship between Teachers' ICT Literacy and their Adoption in Teaching Physical Education

Teacher's ICT Adoption	**Teacher's ICT Literacy Knowledge and Skills**	**ICT for Instruction**
Awareness	0.03 0.862	0.089 0.611
Learning process	-0.249 0.149	-0.072 0.68
Understanding and application of the process	0.148 0.397	0.061 0.726
Familiarity and confidence	0.143 0.413	0.014 0.938
Adaptation to other contexts	.584** 0	.381* 0.024
Creative application to new contexts	.686** 0	.487** 0.003

*significant at p-value <.05 level of significance.

This study determines the level of ICT literacy and ICT adoption of physical education teachers at the University of Mindanao. The results of this study provide information about the readiness of physical education teachers in ICT-assisted instruction for teaching and learning. It clearly shows in the results of this study that the ICT literacy and ICT adoption of physical education teachers are manifested oftentimes. In fact, Kirschner and Woperies (2003) emphasized some main ICT skills that physical education teachers must possess. Competency in using ICT for personal use, mastery of a variety of educational paradigms that use ICT, using ICT as a mind tool, using ICT as a teaching tool, mastering a variety of assessment paradigms that use ICT, and understanding the policy aspects of using ICT for teaching and learning are among them.

The study's findings indicate that some physical education teachers are more likely to use ICT applications and resources for educational purposes, such as the internet, multimedia computers, projector systems, PowerPoint presentations, or word processor programs during the teaching and learning process. At the same time, the advanced usage of ICT, like building a learning website or creating learning software such as educational games, appears to be rarely used in the teaching and learning process or even preparation for educational purposes (Barker, 2002; Jones & Preece, 2006; Park, 2016). Furthermore, the results of the study with regard to ICT adoption are manifested often. Research shows that the success of technology use in educational settings largely depends on the level of adoption of teachers (Albirini, 2006; Baylor & Ritchie & Li, 2021). Teachers' challenges are considered a major predictor of new technologies in educational settings (Albirini, 2006; Trapero, 2021). Thus, their adoption of computers can play an important role in accepting and actual use of ICT. It was revealed that most physical education teachers were able to apply what they knew about technology in the classroom.

They were able to use it as an instructional tool and integrate it into the curriculum of physical education (Knezek, 2001; Kretschman, 2015). However, physical education teachers rarely adopt ICT-assisted instruction for teaching and learning as they know that technology exists but have not used it. Perhaps they even avoided it is as revealed in the study of Balanskat *et al.* & Wastiau *et al.* (2013) and Almulla (2022).

4. Online Training-workshop on Basic Computer Literacy and ICT Integration for Physical Education Teachers: A Proposed Intervention Program for P.E. Teachers at the University of Mindanao

This part of the study presents the proposed intervention program for physical education teachers at the University of Mindanao in all branches. Based on the findings gathered in this study, where teachers' ability and skills to integrate ICT in teaching and learning are often manifested both in ICT Literacy and ICT adoption, teachers need to raise their Knowledge of ICT and how to utilize it in teaching to a higher level. To address this need, prerequisite skills must be developed among the teachers. They must possess basic computer literacy skills. This online training is proposed to increase teachers' ICT literacy and ICT adoption to upgrade their skills in ICT-assisted instruction in teaching physical education. This online training will run for a day through online conferencing, held on summer vacation 2022 (as reflected in the matrix, p. 30). The teachers will be trained on Internet Navigation and Computer Assisted Instructional Materials.

4.1 Rationale

Since the findings showed that there is a need to increase teachers' basic ICT literacy and ICT adoption in teaching physical education, hence this program is proposed. The program is formulated to help increase teachers' readiness for ICT-assisted instruction in physical education. See Appendix C.

4.2 Objectives

At the end of the online training, the physical education teachers are expected to:

a) perform the different ICT-assisted instruction through internet navigation
b) create an ICT-assisted instruction in a specific competency in physical education.

4.3 Proposed Program

Time	Activity
8:00 AM - 8:30 AM	Online Registration
8:30 AM - 9:00 AM	Preliminary Activities
9:00 AM - 11:30 AM	Session 1: Internet Navigation
11:30 AM - 1:00 PM	Lunch Break
1:00 PM - 3:00 PM	Session 2: Computer-Assisted Instructional Materials ISTE standards
3:00 PM - 3:00 PM	Closing Remarks and Online Training Evaluation

4.4 Evaluation

The researcher used the activity evaluation form (F-13050-194/ Rev. # 1/ Effectivity: July 23, 2021) to evaluate the effectiveness of the program. See Appendix C.

5. Conclusion And Recommendation

Based on the results and discussion presented above, results show that teachers' ICT literacy and ICT adoption were at a high level. The study further indicates that physical education teachers are more likely to use ICT applications and resources such as the Internet, multimedia computers, projector systems, PowerPoint presentations, or word processor programs for educational purposes, especially during the teaching and learning process.

Further, the researcher found out that ICT literacy is positively correlated with ICT adoption. Knowing the outcome of this study will foster professional development in the area of ICT-assisted instruction for teaching and learning in physical education. It may encourage the school administrators to conduct school-based in-service training for teachers not only on ICT literacy but also on the integration and use of ICT in the teaching and learning process.

5.1 Recommendation

Based on the conclusions, we recommend that the ICT literacy and ICT adoption level of teachers be raised to a greater extent by sending teachers into basic training courses for computer literacy to uplift their computer skills and knowledge. Also, the internet offers a wide range of references that a teacher can use. Physical education teachers must have access to it in their respective departments. Moreover, teachers must be sent to a training-workshop that will enable them to increase their knowledge in troubleshooting their own computers and basic training on computer repair. Also, webinars on ISTE standards must be included to develop their understanding of ICT competency and ICT adoption in teaching and learning physical education.

Furthermore, the findings and results of the study may provide a valuable baseline data for future researchers to validate the results on a wider scale and provide additional variables or factors that may positively affect the variables under study.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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Appendix C: Proposed Intervention Program Details

Session 1: Internet Navigation

Session Guide Template (Cubar, L., 2013)

<table>
<tr><td>Session 1: Internet Navigation</td><td></td></tr>
<tr><td rowspan="4">Key Understanding
to be developed
National Research
Council 2005.
Signposts in Cyberspace:
The Domain Name
System and Internet
Navigation. Washington, DC:
The National Academies Press.
https://doi.org/10.17226/11258</td><td>The internet is a global system of interconnected computer network that use the standard Internet protocol suite (TCP/IP) to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies. The internet carries an extensive range of information resources and services, such as the inter- linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support email.</td></tr>
<tr><td>A search engine is designed to search for information on the internet. Search engine presents the search results in the form of search result list. The search results can be web, pages, images, videos, and other type of files. To gather and present the searched information, each search engine has their own algorithm, or combination of algorithmic and human input.</td></tr>
<tr><td>A Web Browser is a type of software that retrieves and presents information resources on the internet. The information resource can be text, image, sound, video, or other type of content. In a simple way, we can describe a web browser as a type of software that we use to browse the internet. Some examples of web browsers, each with their own plus and minuses include: -
o Microsoft Internet Explorer,
o Firefox,
o Opera,
o Safari,
o Google Chrome.</td></tr>
<tr><td>Several types of internet connections include:
o Analog / Dial-Up,
o ISDN (Integrated Services Digital Network),
o B-ISDN,
o DSL,
o Cable,
o Wireless Internet Connection / Wireless Broadband,
o T-1 Lines,
o T-3 Lines,
o Satellite.</td></tr>
<tr><td>Learning
Objectives</td><td>Learning Objectives:
o Define the nature of the internet and its uses.
o Familiarize the different commands and bars in the internet browser.
o Use the internet in accessing educational resources and in emailing documents</td></tr>
<tr><td>Instructional</td><td>PowerPoint Presentation</td></tr>
</table>

Material	
Activity	Inform the participants that the following activity will let them use their skills in browsing for documents or media in the internet and import into a document. Individual Task: "The Internet": o Open an Internet browser / Go to a search engine at your choice. o Find a picture of a computer keyboard and download it in your computer. o Insert it on an Office Word application, o Write a caption on it saying "A computer keyboard". o Save it with a filename: "keyboard' in your My Documents.
Evaluation	Evaluate your work using the following checklist: o I don't know how to find a picture in the internet. o I have searched the picture but I don't know how to download the file. o I have downloaded the file but I don't know how to insert in an Office Word document. o I inserted it in an Office word document but I don't know how to write a caption on it. o I have written a caption on the picture but I don't know how to save the document. o I have searched the picture, downloaded the file, inserted in an office word document, written a caption on it and saved the document with a filename: "keyboard".
Analysis	Ask:
Abstraction	Ask:
Application	Workshop "Using the Internet" Individual Task: o Find a picture of Steve Jobs and write a short biography of him. o Save the file with the filename: "Steve Jobs" in your My Documents. o Send the file in my email.

Session 2: Computer-Assisted Instructional Material

Session Guide Template (Cubar, L., 2013)

Key Understanding to be Developed	o Computer-Assisted Instruction is a program of instructional material presented by means of a computer or computer system. o Computer-Assisted Instruction is an instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place. o Computer-Assisted Instruction uses the combination of text, graphics, sound and video in enhancing the learning process.
Learning Objectives	o Define the Nature of Computer-Assisted Instruction. o Create a Computer-Assisted Instructional material.
Resource	PowerPoint Presentation
Activity	Present samples of Computer-Assisted Instructional materials in physical education. Ask the participants to perform the activity in the CAI material.
	Ask: o What have you observed in the material used? o What important features in the CAI material you were interested about? Present the PPT slides about Computer-Assisted Instruction. Explore the participants to the different features of the computer application. Show a demonstration on how to use the different features of the computer application in creating the components of Computer-Assisted Instructional Material.
Analysis	Ask: o Have you thought of a learning competency in physical education that you think is better presented as a Computer-Assisted Instructional Material?
Abstraction	Ask: o How would you do it if given the chance to do the activity again?
Application	Workshop: Computer-Assisted Instructional Material Individual task: o Think of a learning outcome in physical education. o Create a Computer- Assisted Instructional Material of that learning outcome. o Save the file and provide a copy to the facilitator.

Activity Evaluation Form

Name of Activity:	Venue:
Date & Time:	Person Responsible:
Participant/s:	
Evaluation: Please encircle the appropriate rating. **5** - *Excellent* **4** - *Very Good* **3** – *Good* **2** - *Fair* **1** - *Poor* **Facilitator:** • Expertise and competence on topics presented 5 4 3 2 1 • Facilitation of workshop/activity 5 4 3 2 1 • Feedback on workshop outputs 5 4 3 2 1 • Level of interest and enthusiasm 5 4 3 2 1 **Logistics:** • Venue 5 4 3 2 1 • Meal Arrangement 5 4 3 2 1 • Facilities (Amenities) available 5 4 3 2 1 **Participants:** • Gain new insights and knowledge 5 4 3 2 1 • Gain of friendships and networking 5 4 3 2 1 • Impact on interest to try out new insights and knowledge 5 4 3 2 1	
Recommendation:	
What is your overall rating of the activity? Please check the appropriate box. [ ] Excellent [ ] Very Good [ ] Good [ ] Fair [ ] Poor	
Evaluated by: _____ Signature Above Printed Name	Noted by: _____ Signature Above Printed Name