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Teachers' Attitude towards Technology Integration in Physical Education in Finland

Master's thesis

FACULTY OF EDUCATION

Learning and Educational Technology

2023

University of Oulu
Faculty of Education
Teachers' Attitude toward Technology Integration in Physical Education in Finland (Yumin Raitamaa)
Master's thesis, 87 pages, 1 appendix
May 2023

There has been a significant amount of research on teachers' technology integration, and technology has influenced teaching. However, little research has been conducted particularly to investigate the relationship between teachers' attitudes on technology integration in physical education in the K-12 context. This study is conducted with a sample of 221 Finnish physical education (PE) teachers to empirically investigate their attitudes and perceptions toward technology integration in the context of Finland. Further, the current study analyzed the relationships between attitude and practical technology use in PE. Lastly, this research explores the obstacles contributing to technology integration and the technology use variation between genders.

Independent sample t-test, correlation analysis, and stepwise regression were performed in this study. The correlation analysis yielded a positive relationship between the four factors of attitude and the five factors of technology use. According to the results from regression analysis, perception of importance/relevance and technology proficiency significantly and positively predict using internet-related tools and general computer/mobile software. Additionally, the perception of importance/relevance and contextual factors are important indicators predicting the use of general computer hardware. Specifically, the use of PE special computer/mobile software and PE-specific hardware are affected by technology proficiency, teaching style, and perception of importance/relevance. This study also found several obstacles to technology integration in PE: lack of training, administrative support, collegial support, and internet down/unavailable restricting the use of technology in PE instruction. Finally, significant differences were observed between male and female PE teachers in terms of their attitudes toward technology integration. The findings of this research provide administrators and policymakers with significant insights related to the use of technology by Finnish PE teachers in their teaching practices.

Keywords: Attitudes, Perception, Technology integration, Physical Education, Physical education teachers, Obstacles.

Contents

1 Introduction

Today technology is developing at such a rapid rate. Many children and young people spend more than half of their waking hours sedentary either sitting or lying down and this has become a primary contributor to the health issues such as obesity (Kokko & Martin, 2018; World Health Organization, 2000). A common occurrence among the pupils is to spend many hours on mobile devices either sitting or lying down. Lepp et al. (2013) confirmed that computer games and social networking sites like Facebook and Twitter keep teenagers occupied for many hours each day, even to the point where their academic performance and cardiovascular fitness suffer. Russell& Newton (2008) noted that time on screen watching TV, on computers, or playing video games, has been identified by some researchers as a contributor to the current obesity problem. The Childhood Obesity Surveillance Initiative (COSI) of the World Health Organization (WHO) estimated that approximately 33 percent of European children between the ages of six and nine years old were either overweight or obese in the year 2010 (Wijnhoven et al., 2014). Because the main purpose of physical education is to inspire pupils to lead more physically active lives, this might present a challenge for physical education instructors.

The interest and familiarity to use technology can be harnessed to encourage physical activity. Technology can be leveraged and integrated into physical education classes to improve the quality of instruction and inspire students to participate in a wider variety of sports and other active pursuits. According to the basic education curriculum, physical education aims to support the physical, mental, social performance of the pupils, and the well-being of the students will be affected in this way (Opetushallitus, 2016). The Activity Project (2014) is a project developed by the Finnish National Agency for Education to utilize sports technologies in physical education. Also, the Educational Technology school undertook a research project called OPTEK between the years of 2009 and 2011, with the goal of "creating creative solutions and models for the utilization and usage of information technology and electronic media in daily school life." (Kankaanranta et al., 2011).

First, there was a lack of widespread or consistent usage of information technology across a variety of topics in Finnish schools at the time (Kankaanranta & Puhakka, 2008). This is because such a significant proportion of educators did not make use of information technology in

their classrooms and hence most of the possibilities that this innovation presented remained virtually unexplored (Kankaanranta et al., 2011). Furthermore, the findings of the SITES 2006 survey suggest that the main obstacles that hindered the implementation of technology in educational settings include the lack of time on the part of teachers, an absence of digital learning resources, and a deficiency in the IT expertise of educators. Another factor is that principals are unaware technology plays a significant role in the improvement of classroom instruction (Kankaanranta & Puhakka, 2008). Although the former research has investigated obstacles influence technology use, few studies was conducted to identify how those obstacles influence specific use of technology (five factors of the technology use). These five factors are as follows: internet-related tools, general computer/mobile software, general computer hardware, PE specific software, and PE specific hardware.

Second, software and hardware programs are both considered part of technologies. Technologies such as YouTube, search engines, instant message, and a variety of other video games are employed more frequently (Palonen et al., 2011). Shewmake et al. (2015) stated it is vitally necessary that PE instructors can make use of all available tools to inspire and guide their students into leading healthy lifestyles. Students are more likely to be engaged and to take an active role in both the learning process and its facilitation when technology is effectively integrated into instruction (Palonen et al., 2011). However, the adaptable and creative use of technology does demand a significant increase in the amount of time and effort invested by the educator. In addition, it has also been established, via research conducted in other countries, that the attitude of the instructor toward technology is a factor that influences the usage of technology in physical education (Villalba & González-Rivera, 2016). According to most of the studies, teachers have positive attitude towards the employment of technology in their teaching (Kale & Goh, 2014; Kelani & Gado, 2018; Makhlouf & Bensafi, 2021). There was a positive association between the teaching style of the educator and the use of technology Web2.0 in the classroom (Kale & Goh, 2014). Previous research demonstrated that attitude plays an important role in general technology use. However, little research has conducted to identify the relationship between attitudes' factors and specific use of technology (five factors of the technology use). Attitude factors are as follows: importance of perception/relevance, technology proficiency, contextual factors, and teaching style.

Third, existing research indicates that gender could affect teachers' attitudes toward technology use (Kretschmann, 2015; Villalba & González-Rivera, 2016). A study revealed men preservice teachers had more favorable views about technology than female preservice instructors (Akturk et al., 2015). According to the findings of Jamieson-Proctor et al. (2006), female educators are much less confident than their male colleagues in using technology with pupils for educational purposes. Makhlouf & Bensafi, 2021 had the same conclusion that female PE teachers were seen to be less technology competent. Men have used more different technological applications, which are not so common (Ilomäki & Lakkala, 2011). Thus, Tou et al. (2020) convey that it is crucial to investigate whether there are differences in the way male and female PE instructors perceive ICT, as such gender prejudices may still be prevalent in the profession. Although those studies have been focused examining gender variations in the attitudes of PE teachers toward the integration of technology, insufficient attention has been paid to whether there are differences between male and female PE teachers when it comes to the use of specific use of technology (five factors of the technology use).

The four factors of attitude (perception of importance/relevance, technology proficiency, teaching style, and contextual factor) and five factors of technology use (internet-related tools, general computer/mobile software, general computer hardware, PE specific software, and PE specific hardware.) developed by Gibbone et al. (2010) , which was employed to guide the current study. While existing studies mainly concentrated on the use of technology in PE, little has been done on how the attitude can deeply affect specific use of technology and the comprehensive obstacles to influence the integration of technology in schools. Given the importance of teachers' attitudes in integrating technology in their teaching practice, this study using quantitative method, especially employ the regression analysis to identify firstly PE teachers' attitudes towards the integration of technology in PE and the relationships between teachers' perceptions and their technology use. Secondly, seek to examine the obstacles to affect PE teachers' technology use. Lastly, Independent sample t-test will be used to investigate if the gender of PE teachers affects their intention to integrate technologies into their teaching.

2 Theoretical Framework

2.1 Teachers' attitude on technology integration

The term "attitude" refers to a person's emotional inclination, either good or negative, toward things, persons, situations, activities, and opinions (Crano & Prislin, 2006; Papanastasiou, 2002). The identification of the perceptions and attitudes held by educators regarding technology helps grasp their educational needs and the context that influences the decisions, they make regarding its application (Iding et al., 2002). Attitudes are composed of three elements: cognitive, emotional, and behavioral (Maio et al., 2018). At the core of these three aspects is the emotional one, which is made up of one's generally continual favorable and negative feelings about an item; while the cognitive element is about one's beliefs regarding the object of the perspective and the component of conduct that includes the propensity to respond in line with emotions and perceptions (Akturk et al., 2015). Therefore, the concept of the attitude and its components can be applied to gain a deeper understanding of how educators approach the usage of educational technology in the classroom. It is evident that the attitudes of educators toward the use of technology in the classroom have a significant impact on the degree to which technology is incorporated into instructional practices. (Albirini, 2004; Baylor et al., 2002; Teo, 2008).

Compared to those studies above, Gibbone et al. (2010) furtherly classified the attitude into four elements such as perception of importance/relevance, technology proficiency, teaching style, and contextual factors, which provides a more thorough and in-depth explanation of the many facets of attitude (Figure 1). The subtitles of the four factors of attitude will be analyzed in the following paragraphs.

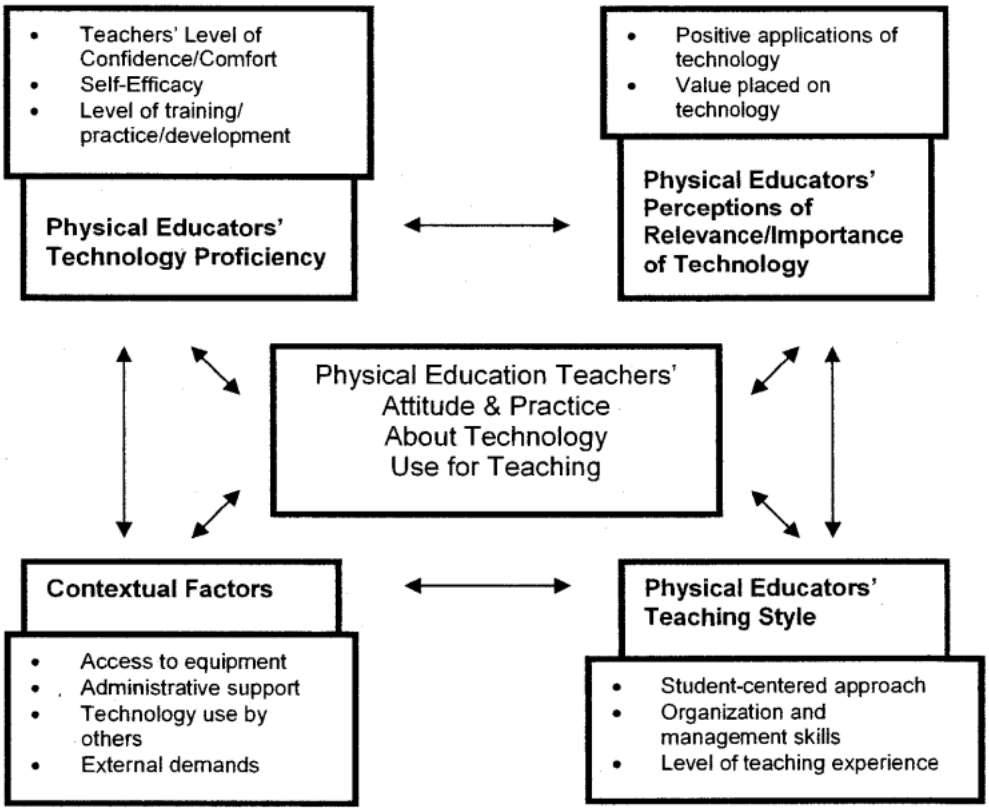

Figure 1 Measurement and Conceptual Model. Screenshot from 'Technology integration in secondary physical education: teachers' attitude and practice' by Gibbone, A. (2009).

The acquisition of computer literacy is promoted by a positive perception as well as a sense of self-sufficiency (Collier et al., 2004; Wang et al., 2004). It is well acknowledged that the level of self-assurance and motivation possessed by educators concerning the implementation of technology in the classroom are essential factors in determining the quality of instruction they provided (Niederhauser & Perkmen, 2010). In addition, attitude also encompasses a person's level of technical proficiency (competence), confidence in their technological skills, and knowledge; those can in turn determine how they put those skills into practice (Teo, 2008; Wozney et al., 2006). Several studies have shown that the importance of computer skills is one of the most significant predictors of teachers' attitudes regarding the implementation of ICT in educational settings (Abu Samak, 2006; Makhlouf & Bensafi, 2021).

Teachers' willingness to learn, in addition to how they perceive the usage of more advanced technical applications, can be predicted based on how well they understand the usefulness of

computers (Zhang & Espinoza, 1998). The usefulness of technology is determined by time involved in applying technology, therefore instructors who dedicate greater amounts of time utilizing technology are likely to have more positive attitudes (Johnson & Howell, 2005). As a result, the experiences that teachers using various forms of technology will enhance their positive perspectives toward technology integration (Migliorino & Maiden, 2004). However, experience with technology alone is not enough, instructors can also be influenced by receiving the proper training. As Dusick (1998) emphasized it has been demonstrated that an individual's attitude and level of competence have a positive correlation with several lessons or the total quantity of training that they take part in.

A teaching style can be defined as an attitude toward the classroom that involves views about the learning process as well as comprehension and interpretation of pedagogy (Kale & Goh, 2014). If teachers' pedagogy is aligned with the technology they employ, there is a better chance that they will use it in a significant way, which demonstrating that this is one of the most important determinants (Brok et al., 2004; Inan et al., 2010). The teacher in the teacher-centered approach is viewed as the subject matter expert who is responsible for transferring their knowledge to their pupils through the delivery of lectures or direct teaching. In this kind of environment, pupils are sometimes referred to as "empty vessels" since they sit passively and take in information from their teachers. The teacher-centered approach is generally considered to be a traditional teaching method. The student-centered approach highlights the importance of the student's active participation in their own learning and caters to their specific interests and requirements. However, the instructor is still in charge, as a facilitator, they will monitor the students' study process and help when it is needed. Becker (1999) stated it is possible that educators who are students-centered will use a variety of creative instructional approaches and will also be more open to implementing technologies in the classroom; and technology integration is more likely to occur in classrooms where teachers prioritize the interests and requirements of their students. It is doubtful that teachers will include emerging technology tools in their courses if they have a negative attitude about the use of innovative technologies, do not understand how to creatively employ them, or are hindered due to the student or lack of availability of the technological resources (Webb & Cox, 2004).

2.2 Technology and Education

2.2.1 Technology in the basics of the Finnish basic curriculum

The increased role of technology in modern society is also reflected in the fundamentals of the revised basic education curriculum introduced in Finland in 2016 (Opetushallitus, 2016). Physical instructors are motivated to make use of technological tools in educational settings. Information and communication technology is an integral part of versatile learning environments; these technological working methods should be chosen in cooperation with the students and considering the content to be taught, in which case they would support learning as efficiently as possible (Opetushallitus 2014, p.29). In the curriculum's general broad-based competence goals, the focus on technology can be seen in many different goal areas. For example, "Thinking and learning to learn (L1)" and "Self-care and everyday skills (L3)" emphasize the importance of technology importance as part of the learning process at school, but also its position as part of the student's entire life (Opetushallitus 2014).

2.2.2 Technology integration and Physical Education.

Before analysis the technology integration, the definition of integration is important to be clarified. Clarification is necessary on both how effectively technology may be utilized in the classroom as well as what is meant by the term "integration". The concept of integration, which is described as a persistent reliance on a variety of educational technologies, encourages educators to select activities and get prepared to instruct using various technologies (Bauer & Kenton, 2005).

What would be the connection between technology integration and physical education? Technology has proven to be effective for teaching and learning (Migliorino & Maiden, 2004) and physical education may be not an exception. For example, researchers have found a variety of instructional technologies, sports technologies, and technology related to PE and physical activity that have the potential to improve the quality of teaching in the field of physical education (Roblyer & Doering, 2007). There has been a significant amount of integration of sports technology into physical education (Semiz & Ince, 2012). Technology, and more specifically

exercise technology, exists in a variety of ways (Polak et al., 2016). However, schools have not really woken up to investing in the possible technology integrations of physical education in an environment different from the classroom (Tearle & Golder, 2008). Although technology has been used relatively little in physical education, there is still time to investigate what and how technology has been utilized in physical education at school (Semiz & Ince, 2012; Shewmake et al., 2015). Even if the importance of integrating technology is generally acknowledged by faculty, efforts and meaningful utilization may be hampered by barriers that exist within the environment of instructors (Ertmer, 1999). While those teachers' contexts might include teachers' attitudes and competence, teachers' frequency of technology usage, access to technology, and the curriculum.

The attitudes of teachers towards the integration of technology have become an important factor in the investigation of difficulties of implementation (Lumpe & Chambers, 2001). Teachers' attitude and competence towards technology play a central role when information and communication technology is integrated into the school world (Preradović et al., 2017). Teachers who have made more frequent use of technology in their personal lives are more likely to include it in their lessons than teachers who have made less frequent use of technology in their everyday lives (Swallow & Olofson, 2017). Kusano et al. (2013) have stated that when teachers have higher technology resources usable, would they be more positive about the use of technology in their classroom teaching and would also use it more. When instructors are actively engaged in planning for the integration of technology into the curriculum, which leads to teachers making good use of technology in classroom sessions, it could be motivational for instructors to be presented with application ideas that are specific to PE (Willis, 1993).

2.2.3 Technology applications used in Physical Education

Educational technology is widely used in various subjects in schools. However, in comparison to the other subjects, the PE subject has content-specific technology that can be utilized in the PE lesson. The definition of technology applications and benefits are presented from previous studies. One of the reasons for the importance of incorporating technology into school physical education is specifically related to its role in sports and physical activity in general, as well as in improving the health of individuals; motion capture techniques, for instance, can be used

across a variety of applications, including improving the efficiency of the training process (Polak et al., 2016). Technology has been useful in many sports-related items. The capabilities of digital videography, particularly those based on its recording and reflection, have recently risen to the forefront of discussion in the context of scenarios involving physical education and athletic endeavors (Daehlin et al., 2017).

How can reasonable categorization be achieved when dealing with a variety of technological applications? The findings of studies have categorized them in a variety of ways. For example, Gibbone et al. (2010) concluded the technology application includes five aspects (a) general tools, (b) video, (c) software, (d) internet, and (e) applications. Waller et al. (2022) defined technology application as the content-specific technology and clarified as three aspects (a) monitoring devices, (b) applications and software, and (c) exergaming equipment; Waller et al simply defined applications and software as "apps," and emphasized how to integrate a wide variety of different applications effectively to the PE class. Gibbone et al. (2010) categorized technologies into five dimensions namely: (a) internet-related tools, (b) general computer/mobile software, (c) general computer hardware, (d) PE specific software (e) PE specific hardware.

In terms of internet-related tools, internet search engines (Google, Bing, etc.), instant messages or chat groups (e.g., FB messenger, FB groups, WhatsApp, etc.), online materials for physical education teachers (e.g., Sporttipankki) and so on are common technology resources used by PE teachers for their lesson design and preparation. Teachers can readily receive access to a wide variety of teaching resources by using the Sporttipankki channel through youtube, and they are able to connect with one another and share their experiences as instructors as well as teaching strategies using WhatsApp and FB messenger.

Regarding general computer/mobile software, the most popular applications are the electronic grading and group division apps (e.g., Team Shake, Team Maker), which make it easier for PE instructors to organize the students and divide them into teams in a way that is more fair, productive, and enjoyable for the class.

Concerning general computer hardware, the use of a video camera is by far the most common and widespread method of recording any kind of physical activity or movement (Polak et al., 2016). Similarly, Palao et al., (2015) concluded that the use of video feedback was beneficial

in promoting student performance. Besides, in the classroom, the LCD projector and smart board is very universal basic technical equipment, which can be applied everywhere in the school in Finland. Same as other subjects, educational CD-ROM or DVDs can be easily accessed to have a health education class.

In connection with PE specific software, PE specific software not only contains the plan of exercising, health and nutrition elements, professional opportunities, biomechanics, and health status tracking but also includes learning and analysis of sport technique, rules, and strategies (Mohnsen, 2008). Activity trackers have been the most common and well-known method for recording one's level of physical activity. For example, wrist-worn digital PA monitors have the potential to be an effective tool for encouraging more regular exercises and activity (Pellegrini et al., 2012; Qiu et al., 2014) . Similarly, Gray et al. (2013) stated the aspects of the activity tracker that record one's physical activity have been evaluated for their efficacy in a variety of situations, including as an aid to weight loss. There is a wide variety of available fitness and activity-tracking apps available today. For example, the Polar Beat is high-quality activity and fitness tracking app, which works in conjunction with a heart rate monitor or an activity monitor to provide accurate results. Besides, exercise games have also been used in physical education, which has been found to be lifting students' physical activity (Sun, 2013). Various videogames, for example, in the form of Pokémon Go, Just Dance, and Jungle Race mobile applications are not only very popular with the students but also adults.

In respect of PE specific hardware, pedometers, and heart rate monitors have been integrated into physical education classes at school, which have had positive effects on students' physical activity (Clapham et al., 2015; Mikkola et al., 2011; Waller et al., 2022). Mikkola et al. (2011) emphasized pedometers were employed in the FutureStep study, which aimed to raise the students' level of physical activity as well as their interest in exercising and maintaining a healthy lifestyle. In conclusion, those kinds of technology devices give the student the ability to record concrete outcomes and receive direct feedback on their achievements, which they consider to be useful in developing both their motivation and their physical ability.

How can PE instructors successfully integrate technology, particularly when teachers are confronted with a wide variety of educational exercise technology apps. Hofer and Harris (2009) stated curriculum and pupils' content-related learning processes are at the heart of effective

technology integration, with teachers' knowledge of and skill with relevant technologies coming in a close second. However, the study claimed extensively how successful technology integration is based on curriculum, but without providing specific standards and instructions on how to implement it in a way that is both concrete and effective in the classroom. More specifically, Hagenbach (2017) created standards for selecting suitable apps to integrate into the PE class (a) targets of using the app, (b) will the activities I plan to have my students be active and moving around? and (c) based on the principle of learner-centeredness, the instructor tailors the educational application to suit the needs of the students. As a result of having these kinds of criteria to follow as a guide, physical education teachers will have a greater number of opportunities to select the most appropriate educational technology to successfully integrate into their lessons., instead of randomly selecting and utilizing software from the large available pool without any goal in mind.

2.3 Factors attribute to the use of technology in education

The above literatures already explained how attitude and perception influence the employment of technology. However, it is not enough if teachers perceive positive attitude in terms of use the technology in their classroom. Obstacles to teachers' efforts to integrate ICT may be extrinsic (such as a lack of access to technology and lack of time for preparing lessons that use ICT) or intrinsic (stemming from the attitudes that educators hold about both learning and instruction) or a combination of the two (Ertmer, 1999; Pelgrum, 2001). The availability of resources and training, as well as the internet and software, the size of the class, and the configuration of the school all play important roles in determining how effectively teachers use technology (Lumpe & Chambers, 2001). Villalba et al. (2017) revealed that the most recently reported barriers, according to one research of Spanish physical education instructors, were (a) less time for physical exercise; (b) not having enough resources; (c) a lack of time, training, and knowledge; (d) inappropriate usage of technology; and (e) technical challenges. According to Gibbone et al. (2010), the budget is the factor that poses the greatest challenge to the successful implementation of technology in schools; on the other hand, the role that school administration, the internet available, and collegial support play in influencing teachers' attitudes toward the application of technology are relatively minor. Based on previous research, the barriers will be

mainly classified into the following aspects such as access to technology, technology training, administrative support, colleague support, and class size.

2.3.1 Access to the technology

Information and communication technology educational use may remain if technological devices have been considered unreliable in terms of durability and for its functionality (Palonen et al., 2011). Despite having the educational technology available, educators could have the sense that they do not have accessibility to it in some situations since the devices might not work properly (Lim & Khine, 2006). According to the findings of Tearle & Golder (2008), there are fewer opportunities for teachers to acquire the necessary skills to make effective use of technological tools in educational settings when access to and availability of such tools are restricted. Budgetary limitations may be a significant factor in the decision to restrict teachers' access to technology in schools. Without enough budget from the principals, it would be difficult to purchase technology-related tools. As Thomas & Stratton (2006) identified, the technology budget for physical education is another factor that should raise concerns considering the high price of technological advancements. Therefore, for technology to be integrated into the classroom, it is essential that educators have access to the necessary technological tools.

2.3.2 Technology training

Teachers are role models for their students and must be equipped with the skills necessary and suitable training to deliver the best education possible if they are to help their students develop into digitally literate adults (Lumpe & Chambers, 2001). It is more likely that teachers will use technology if they are dedicated to their careers and have good attitudes throughout professional development and after receiving training (Collis, 1996; Vannatta & Fordham, 2004). However, teachers have criticized technology courses that are too short or narrow, which according to them, there has been no impact on their own technology competences (Mathevula & Uwizeyimana, 2014). The field of information technology pedagogy has the fewest available training options in Finland, even though a significant amount of training is organized either within the school or by other parties (Palonen et al., 2011). If teachers feel that this skill is lacking,

technology is often completely left out of the teaching or it only functions as a one-way information transmitter, such as projecting assignments on a smart board (Järvelä et al., 2011).

According to the findings of the survey, an increased number of information skills are required to make use of cloud services and to share content (Kaarakainen et al., 2017). A teaching style can be defined as an attitude toward the classroom that involves views about the learning process as well as comprehensive findings of the survey, an increased number of information skills are required to make use of cloud services and to share content (Kaarakainen et al., 2017). It has been demonstrated that an individual's attitude and level of competence have a positive correlation with the number of courses or the total quantity of training that they take part in (Dusick, 1998). The most important determinants of technology use are the level of devotion and openness to change displayed by educators, together with the quantity and quality of technological training received by instructors (Dusick, 1998; Vannatta & Fordham, 2004).

2.3.3 Administrative support

Administrators and faculty technology committees often underestimate the technological requirements of physical education, mostly because they are unaware of the opportunities that technology presents in PE (Pyle & Esslinger, 2014). This implies that physical education instructors generally do not receive support or encouragement from the leadership of the school, and the founding would be given other subjects. Positive attitudes toward the incorporation of ICT in educational settings are associated with educators who are provided both enough technical help and the motivational backing of administrators (Chigama & Goronga, 2022; Tezci, 2011). As a result of this, the findings imply that the physical education teacher is not the limiting element when trying to implement technology in the classroom; rather, it is variables exterior to the classroom, such as administrators (Waller et al., 2022).

Administrative support can be expected to take a significant portion of the responsibility for incorporating ICT across the curriculum in schools, according to the results, many educators believe that inadequate technology tools, a lack of time, concern with curriculum content, and a lack of administrative support are significant impediments to the employment of computers in the teaching profession (Makhlouf & Bensafi, 2021). Studies have found a correlation

between administrative support and instructor perception. (Dwyer et al., 1991; Migliorino & Maiden, 2004); additionally, a lack of adequate administrative assistance hinders the effective utilization of a variety of educationally relevant technology (Lim, 2007). Therefore, those studies indicated that when teachers are given support from administrators, it increases the possibility that they will employ technology in their teaching.

2.3.4 Collegial support

There is not much evidence in the literature to prove the connection between colleague support and teachers' attitude and the use of technology. However, Finnish schools use a lot of the tutor-teacher model, where teachers work in pairs and reflect on opportunities and problems of technology together (Preradović et al., 2017). Similarly, because learning between colleagues occurs most effectively in situations involving practical work, the method of providing support to coworkers has been shown to be beneficial (Kaarakainen et al., 2017). However, (Gibbone et al., 2010) it is unclear the role of collegial support in the use of technology among physical activity educators.

2.3.5 Class size

A recent study concluded that large class sizes were the main factor preventing the use of technology in the classroom (Waller et al., 2022). Waller discovered that many educators working in public schools have the opinion that excessively large class sizes are an impediment to learning. In addition, Waller's study also emphasized according to the teachers' grade level, those who taught in secondary schools were more likely to agree that class size constituted a barrier than their colleagues who taught in primary schools. Previous studies indicated that class size constraints prevent full technological integration because of a lack of available space (Woods et al., 2008). The class size is decided by the number of students, while too many students would demand more PE instruction time in terms of integrating technology into teaching activities. It is becoming increasingly challenging for teachers of physical education to employ digital resources in a way that is both educationally beneficial and practical given the size of their classes. Tezci (2011) identified the number of students enrolled in the class, which might be challenging for the instructor to maintain control over the class.

2.4 The role of gender towards teachers' attitude and technology use

There have been reports that some demographic variables, such as age, gender, educational levels, years of teaching experience, and number of years spent using technology, may have correlations with one another (Wozney et al., 2006). Different findings were found in studies that examined gender variations in the attitudes of PE teachers toward the integration of technology.

It was claimed that gender is not thought to be a relevant factor when assessing the attitude of teachers and its effect on the implementation of technology (Makhlouf & Bensafi, 2021; Serin & Bozdağ, 2020; Zyad, 2016). Makhlouf & Bensafi (2021) explained this may be regarded as an outcome of the democratization process of technology, in which female and male teachers have equal possibilities of using the computer and the internet, so helping them to acquire positive perspectives toward technology. According to the findings of Jamieson-Proctor et al. (2006), female educators are much less confident than their male colleagues in using technology with pupils for educational purposes. Thus, Tou et al. (2020) convey that it is crucial to investigate whether there are differences in the way male and female PE instructors perceive ICT, as such gender prejudices may still be prevalent in the profession.

2.5 Literature Review

2.5.1 Teachers' perceptions towards technology usage in the educational settings

Most of the research focuses on the perspective of teachers in other subjects about the application of technology. Nonetheless, there is only minimal study concerning the perceptions of PE teachers regarding their use of technology. Therefore, this study attempts focused previous research that has explored the perceptions of the PE instructors towards their implementation of technology and the factors that contribute to it. In the end, it determines the most appropriate and comprehensive practical model to structure this investigation.

According to most of the studies, educators have favorable opinions towards the employment of ICT in the classroom (Kale & Goh, 2014; Kelani & Gado, 2018; Makhlouf & Bensafi, 2021).

Contrary, Chigama & Goronga (2022) hold a different opinion that many educators had negative attitudes toward the integration of technology because of many difficulties involved. Before exploring the influence of attitude on technology use, it is crucial to first analyze the components of attitude. A current study concluded that, attitudes are classified into three elements: active, cognitive, and behavioral (Maio et al., 2018). Trujillo-Torres et al. (2020) stated the three elements exhaustively, the active element is comprised of the sentiments and thoughts that drive the process of making choices; in terms of the cognitive component, its stability can be attributed to the opinions and principles that are tied to the individual teaching experiences of each instructor; while the behavioral element concentrates on the actions and purposes of the instructor when confronted with a certain situation in which they are required to behave. According to (Brok et al., 2004; Gibbone et al., 2010; Inan et al., 2010; Jimoyiannis & Komis, 2007) teaching style is an important predictor of teachers' attitude toward technology use. However, the study of Kale & Goh (2014) showed in spite of the fact that many educators claim to prioritize student agency and active participation in the classroom as essential tenets of the constructivist pedagogy they practice, just a minority find Web 2.0 tools to be useful in their classrooms; their study suggested that no significant correlation observed between teaching method and instructors' attitudes on the usage of technology in the classroom.

Makhlouf & Bensafi (2021) employed quantitative methods to analyze through three dimensions of teachers' attitudes towards technology use, those three dimensions include cognitive, affective, and behavioral domain; the research results indicated that the 50 teachers hold a positive attitude among the three dimensions towards the employment of the ICT. Kretschmann (2015) used the sample of 57 secondary school PE teachers and a quantitative research method, and established the "subjective theory" framework to clarify the attitudes and perspectives that PE instructors have regarding technology concerning eight distinct categories that include students, teaching, teachers, equipment, ICT literacy, classroom management and organization, social interaction, and innovative and modern teaching; the eight categories included 63-item instrument, respondents completed a Likert scale from 1 (strongly disagree) to 5 (strongly agree) to indicate the extent to which they agreed with each statement.

Based on the "subjective theory", Tou et al. (2020) developed this theory and finally the six distinct variables that were employed to assess 422 full-time PE instructors' attitudes toward the

implementation of technology into PE are as follows: classroom management and organization, ICT literacy, equipment, innovative and modern teaching, student, and social interaction-related subjective theories. Also, a study conducted by Gibbone et al. (2010) indicated that there are relationships between teachers' attitudes and technology use. Their study used the model with four factors (perception of importance, technology proficiency, contextual factors, and teaching style) of attitude and five technology-related factors (internet related tools, general computer/mobile software, general computer hardware, PE special computer/mobile software, and PE specific hardware) in technology use section. However, the authors of the study have not given the details of how to clarify the 46 technology items into five technology types. Based on the five technology types, the current research deleted the old technology items and new technology items were added to the list of available technologies.

2.5.2 Factors that contribute to teachers' use of technology

Jun-Hyung Baek et al. (2018) explored technological practices and the challenges of the PE teachers from elementary and secondary schools. The study used open-ended questions based on four crucial aspects, such as the availability of technological resources, the time and effort spent on learning new technologies, the significance of technological integration is valued and expertise in incorporating technology; in addition, according to the findings of this study, physical education teachers need assistance in the form of high-quality training on the effective integration of technology for their students' education.

Research indicates that when teachers receive more training possibilities for the educational technology, their attitude will be more positive (Albirini, 2006; Makhlouf & Bensafi, 2021; Zeinab Abu Samak, 2006). In line with the findings of earlier studies, Waller et al. (2022) discovered that the most significant challenges that physical educators face were class size, budgetary concerns, and a deficiency of resources; other factors, such as a lack of connectivity, a lack of motivation, and inadequate time, were also identified as contributors to the problem, while an insufficient knowledge or lack of skills are not seen as being impediments to adopting technology during teaching. In addition, the class size component is not addressed by much research. However Waller et al. (2022) indicated that class size is the bigger factor from the research results; compared to people over 60 years old, those in the age group of 21–30 years

find that the size of their classes is more of a challenge, when asked about the challenges they face in the classroom, physical education instructors at the high school and secondary levels were more likely to say that class size was an issue than it was at the elementary level. As to the methodology, both quantitative and qualitative approaches were utilized to better understand the factors influencing educators' adoption of technologies, and the PE instructors from elementary, middle, and high schools all took part in this study as participants. In comparison to much great deal of other studies, the study by Waller et al. is the most recent and thorough one regarding the factors that influence the use of technology by instructors.

Similarly, Hill & Valdez-Garcia (2020) indicated the lack of comprehension on how to integrate technology was cited as the most significant perceived obstacle to the implementation of educational technology, lack of motivation to make advantage of technology, due to a shortage of time because of rigorous examinations and absence of adequate technical support. On the other hand, the relationship between PE instructors' computer literacy and technology employment in PE was investigated by Kretschmann (2015). The participants in the study included 57 PE teachers currently employed in high schools. The data was analyzed using quantitative statistical methods. The results of this study indicated that PE teachers' computer literacy influenced their technology use in PE, in other words, the higher their computer literacy level was, the more likely they were to include technology in PE.

In addition to the above inspects that have already been stated, the demographics characters of teachers have also been the subject of a great deal of interest that warrants further investigation into its the effects of technology integration. For example, research conducted by Semerci & Aydın (2018), used a non-experimental descriptive survey approach to investigate teachers' perspectives on the implementation of ICT. A total of 353 high school teachers participated and they found no correlation between instructors' readiness to use technology and demographic variables such as gender, age, or years of experience in the classroom. However, (Tou et al., 2020) found gender differences regarding the use of technology in physical education, particularly in the area computer literacy, innovative and modern teaching-related areas; The authors stated the gender gap in computer literacy may explain why male PE teachers report feeling more confident and competent in their use of technology tools than their female counterparts.

Also, in Nordic countries especially Finland, there is very little research about PE teachers' attitudes towards technology use in general.

There is very few research about PE teachers' attitude towards technology use in Nordic countries, especially in Finland. Considering this gap, this study is conducted in Finland with 221 Finnish primary teachers and secondary PE teachers. Tackling individual and contextual technology integration factors, the current study used the quantitative methods, that is, regression analysis was performed to comprehensively explore the relationship between attitude and technology use. Further, t-tests will be used to identify importance/relevance, technology proficiency, contextual factors, and teaching style towards technology use between genders. Previous studies, such as Hill & Valdez-Garcia (2020) and Waller et al. (2022) have focused mainly on identifying the barriers that influence the use of technology for PE teachers, as well as the types of educational technology employed by PE teachers. However, attitude is not considered a critical component in predicting technological use in their research. The current research investigates perceptions that physical PE teachers have on the utilization of technology, as well as the obstacles that contribute to the implementation of technology.

In total, despite the attitudes of teachers play a significant role in the employment of technology in the educational setting, there are relatively few studies that investigate the attitudes of primary school, middle school, and high school PE teachers toward the use of technology in physical education. Given this, more research is required to investigate the attitudes of educators about the implementation of technology in PE. Considering this gap, this research explores the relationship between the four factors of the teachers' attitude (perception of importance/relevance, technology proficiency, contextual factors, and teaching style) and the five factors of the technology use (Internet-related tools, general computer/mobile software, general computer hardware, PE special computer/mobile software, PE special hardware). Further, this examines the factors that contribute to technology use based on the literature and model created by Gibbone 2009.

3 Research Methodology

3.1 Aim and research questions

The goal of this research is to understand the perception of Finnish PE teachers towards using technology in PE classes in the context of Finland. Successfully integrating technology in physical education classes can make teaching methods more diversified both inside and outside the classroom for the purpose to having a healthy lifestyle. Thus, this study aims to explore the attitude or perception of PE teachers towards the integration of technology and the relationship between the use of technology and their perceptions. Obstacles contribute to the four attitudes factors and five technology factors are also identified. In the final part of this research project, the gender factor is investigated to determine whether there are significant variations in the way that male and female physical education teachers perceive the utilization of technology.

RQ1. What are physical educational teachers' attitudes towards integrating technology in primary school, middle school, and high school in Finland?

RQ2. What is the relationship between the attitudes/perceptions of physical education teachers towards technology and their use of technology?

RQ3. What are the factors affecting PE teachers' attitudes and their technology integration into their teaching?

RQ4. What are the attitudes/perceptions differences toward technology use between female and male physical education teachers?

3.2 Participants and context

This study surveyed primary school class teachers and secondary physical education teachers (N = 221) in Finland. Participants from Southern, Western, Eastern, and Northern Finland. Northern and Southern contributed the most surveys in this study. In this sample, 161 (72,8%) females and 60 (27.1%) males participated ranging from 20 to over 64 years of age. Teaching experience ranged from 0 to over 31 years. All the participants had a master's degree. There

are no professional PE teachers in the primary schools in Finland; instead, the class teachers play the role of PE teachers in the PE lessons.

3.3. Data collection procedure

The survey was reviewed by the researcher and after small modifications, the questionnaire was translated from English to Finnish so that the participants Finnish teachers who participated can understand the questions accurately. The questionnaire was designed through the digital survey service known as Webropol 3.0. The questionnaire employed Likert scale questions to collect quantitative data. The survey link was sent to most primary school teachers, middle school, and high school PE teachers through public communication tools on the Internet, like social media PE teacher groups. Besides, the researcher looked through the schools' websites to get the physical education instructors' email addresses. Social media like Facebook helped increase the marketing of the survey and exposure to many viewers through the Internet and increase the likelihood for participants to join. Respondents were also encouraged to forward the survey link to other PE teachers.

The middle school and high school PE teachers and the class teachers in primary school who teach PE are mainly active in the Facebook (FB) groups in Finland. For example, Oslo ry (Oulun seudun liikunnan ja terveystiedon opettajat ry 70 members) is the local PE teachers association; Jotain todella uutta liikunnanopetuksessa(11700 members) is the whole Finland's PE teachers FB group focus on creating innovative teaching, including brings technology into the teaching environments. The rest are Alakoulun aarreaitta – Ideoita ja oivalluksia opetuksen tueksi, Tieto-ja viestintätekniikka opetuksessa/ICT in Education and SOKF (Suomen opettajien ja kasvattajien foorumi). The servey data are maily come from Oslo ry (Oulun seudun liikunnan ja terveystiedon opettajat ry 70 members), Jotain todella uutta liikunnanopetuksessa (11700 members), and Alakoulun aarreaitta – Ideoita ja oivalluksia opetuksen tueksi. All the PE teachers who received the email responded voluntarily.

The research was carried out in accordance with the rules for research ethics that were established by the Finnish Advisory Board on Research Integrity. Before starting to respond to the questions, the participants were informed of the purpose of the research, confidentiality, and

anonymity. Collected data is used only for this study but not for any other purposes. The respondents will check the confirmation that ("I have read the preceding information and agree to participate in this study"). A follow-up email was sent around two weeks after the initial email. It was found that not all recipients completed the survey after the first email. The second reminder was sent again two weeks later after the first reminder to gain more participants. Multiple attempts at sending recruitment emails are very necessary over the data collection period. The aim of this study was to acquire as many completed surveys as possible from physical educators who teach at the primary school, middle school, and high school levels.

3.4 Instrument

The order of the parts in the questionnaire has appropriately changed for a reasonable design and contents. Items reviewed by the researchers and technology items were then added to represent current technology available to physical educators. Outdated technology items are deleted, and technology that is used/existed in America but not in Finland is deleted.

A 21-items questionnaire of Physical Education Teachers' Attitudes and Technology Practice Questionnaire (PEATPQ) using previously published instruments and developed by (Gibbone et al., 2010) will be used in this study. The questionnaire was classified into four major factors including a) physical educators' perception of relevance/importance of technology (7 items); b) contextual factors (6 items); c) physical educators' teaching styles/beliefs (4 items); and d) physical educators' technology proficiency (4 items). The items are rated on a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree) for the attitude section of the instrument.

In attitude parts 4 and 5, 22 total attitude items separated into four factors changed to 21 total items. The teaching style factor has four items, one item *Behavior management affects my decision to use technology in PE* is deleted for the concept and meaning are not so clear, thus only three items left. Demographical questions, technology employment, the equipment of technology items, and frequency of technology use are also adopted in the survey. The survey was checked by a few professionals for appropriateness of all the contents.

To investigate the connection between the attitudes of educators and the use of technology, many different types of technological items were categorized into five factors by Gibbone et al.

(2010). The technology use section also builds on by their categorization of technologies to update and refine the classification of educational technologies considering recent advances in the field, as well as differences in how technologies are adopted and used across geographic and cultural boundaries. In parts 6, 7, and 8 technology equipment section 38 items. Eight items were deleted from the original 46 items. Some very old technology items and technologies that are not used in Finland are deleted. New PE special software and hardware items were added to the technology section.

PE teachers were required to report their knowledge, accessibility, confidence, and technology employment for teaching in relation to specific technology items. After a profession's suggestion, five choices: I have knowledge of this, I access this in school, I feel confident using this, I use this to teach, I have never used this, which indicate your knowledge and use of these items are changed to another five choices:1 I don't know the application / tool.2 I know the application / tool, but I haven't used it. 3 I have tried this application / tool a few times. 4 I am well acquainted with this application / tool, and I use it regularly in my teaching. 5 I know this application very well and use it often and in many ways in my own teaching. And multichoice are changed to single choice. Additionally, Average Percentages for Technology Use Variables/items based on Clustering of Technology Items by Type, Internet Related Tools, General Computer Software, General Computer, PE Specific Computer Software and PE Specific Hardware. However, the original questionnaire has not provided the detail of how to classify it, the researcher classified the technology equipment based on the technology equipment types.

After a few small changes, the instrument was used to check the reliability scores and conceptual fit of each item employing Cronbach's alpha coefficient for every variable in the survey's part on attitudes and technology use. The overall alpha coefficient for the technology use section was .948. The alpha coefficient for PE specific technology use and general technology use were separately .932 and .912. (Here specific technologies use means PE specific computer software and PE specific hardware. General technology use means Internet related tools, general computer software, and general computer hardware). For the entirety of the attitude section, the alpha coefficient was at .900, based on attitude factors from (Gibbone et al., 2010). A few experts have reviewed the questionnaire and given strong proof of content validity.

3.5 Data analysis procedure

The Pearson correlation analysis method was applied to examine the relationships between the following variables. The attitudes/perception of teachers towards technology and their use of technology; technology training and technology use; teachers' attitudes and technology use and barriers variables; and frequency of technology use and the general technology use. Secondly, an Independent sample *t*-test was used to determine whether there is a difference in attitude towards technology use between female and male PE teachers. Lastly, stepwise regression analysis was performed to predict teachers' perceptions of technology integration by comparing the attitude factors and the technology use factors. To predict the levels for general technology use, regression analysis also was employed. Statistical Package for the Social Sciences 27 (SPSS) was deployed to analyze the collected data.

4 Results

4.1 RQ1. What are physical education teachers' attitudes toward integrating technology in K-12 context in Finland?

Attitude is an important factor to predict and explain why teachers use or do not use technology in their PE lessons. Table 1 shows the 21 attitude items, which present PE teachers' perceptions or attitudes toward integrating technology in primary school, middle school, and high school.

The first factor perception of importance/relevance (M=2.24. SD=.48) on a scale of 1 (strongly agree)-5 (strongly disagree). This indicated that on average teachers responded with a positive attitude for the items in this factor. It can be observed from attitude item 1 *Technology can enhance the quality of PE* (M=2.11, SD=.64) had the second highest percentage with 69.7% of the respondents agreeing to Item 1. The response for item 1 shows that the PE teachers interviewed generally agree that the use of technology could potentially play an important role to enhance the quality of teaching in the classroom. This view from the respondents shown in table 1 that combining the percentages of totally agree (11.8%) and agree (69.7%) with a high percentage of 81.5%, further demonstrates that the teachers who participated in this survey indicated that technology could enhance the quality of physical education. Although there are only more than half exceed 55.2% responded to Item 7 *I make an effort to apply a variety of technology within my instruction*, most of the teachers in this study indicated (75.1%) that item 6 *they would consider technology when redesigning curriculum.* Items 4 *After learning something about technology, I attempt to implement it*. (M = 2.00, SD =.65) had the highest percentage with 75.1% of the respondents agreeing to item 4. The response for item 4 shows that the teachers have a very positive attitude that they put what they have learned about the technology into practice. Item 4 also occupied the highest percentage among all the attitude items in the Perception of Importance/Relevance factor, when combining the percentages of totally agree (14.9%) and agree (75.1%) with a high percentage of 90%. This again indicated that the most of PE teachers (86%) in this study expressed that item 2 *They use a variety of learning methods for students in physical education.* Item5 Technology training has been a positive experience for me (61.5%). Item 3 Having more technology available would increase my use when teaching (67.9%).

The mean for the attitude factor technology proficiency factors was (M=2.98, 0.40). This also indicates that, on average, teachers responded to the items in the factor with a positive attitude. Item 8 displays 53.8% of *PE instructors feel confident with their current abilities* and item 11 shows *65.2% of using technology to teach is enjoyable for them*. Item10 reveals 49.8% a bit less than half responded that *technical problems and troubleshooting make them feel tense*, yet in item 9 only respondents 36% expressed that *most technology is frustrating to use for me without help.*

For Contextual Factors (M = 2.77, SD = 0.61), the mean also reported that PE instructors generally responded positively to the six items listed. According to physical educators that 60.7% reported in their school, *most teachers use technology when teaching*. Based on this figure, it is reasonable that most teachers 71.9% stated that *they are expected to be knowledgeable in the uses of technology*. However, although there are 60.7% of *teachers responded in their school that most teachers use technology when teaching*, only 43.9% of respondents *know of many PE teachers who use technology to teach*. 61.5% of teachers reported that *they can easily access technology resource personnel in my school*, yet only 32.1% of teachers stated that *they have enough technology equipment appropriate for their class size*. Close to half of the teachers 45.2% reported *that their suggestions for staff development activities are valued by administrators.*

Teaching style factor (M = 3.12, SD = 0.46), it can be observed that this factor had the highest mean value of 3.12 among other factors. Same as the factors of perception of importance/relevance, technology proficiency, and contextual factors, on average, the teaching style factor indicated teachers had a positive attitude about these items. There are physical education teachers demonstrated 72.4% *of technology use promotes student motivation/participation in PE class*. While the rest items take up a small percentage as 24.9% of teachers *stated it is difficult using technology to teach PE*, just 18% reported *technology does not accommodate personal learning styles*, yet 23.6% of think *technology takes time away from more important concerns.*

Table 1. Teachers' attitudes toward the use of technology in the classroom

Attitude factors M (SD)	Attitude Items(I) (I1-I21)	Totally agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Totally disagree n (%)	M (SD)
Perception of Importance /Relevance 2.24 (.48)	I1 Technology can enhance the quality of PE	26 (11.8)	154 (69.7)	32 (14.5)	9 (4.1)	-	2,11 (.64)
	I2 I use a variety of learning methods for students in physical education.	43 (19.5)	147 (66.5)	11 (5.0)	20 (9.0)	-	2,04 (.78)
	I3 Having more technology available would increase my use when teaching.	48 (21.7)	102 (46.2)	32 (14.5)	31 (14.0)	8 (3.6)	2,32 (1.07)
	I4 After learning something about technology, I attempt to implement it.	33 (14.9)	166 (75.1)	11 (5.0)	10 (4.5)	1 (0.5)	2,00 (.65)
	I5 Technology training has been a positive experience for me	23 (10.4)	113 (51.1)	65 (29.4)	19 (8.6)	1 (0.5)	2,38 (.80)
	I6 I would consider technology when redesigning my curriculum.	32 (14.5)	134 (60.6)	38 (17.2)	17 (7.7)	-	2,18 (.77)
	I7 I make an effort to apply a variety of technology within my instruction.	14 (6.3)	108 (48.9)	49 (22.2)	47 (21.3)	3 (1.4)	2,62 (.93)
Technology Proficiency 2.98 (0.40)	I8 I feel confident with my current ability to use technology for teaching.	20 (9.0)	99 (44.8)	28 (12.7)	63 (28.5)	11 (5.0)	2.44 (.94)
	I9 Most technology is frustrating to use for me without help.	3 (1.4)	33 (14.9)	18 (8.1)	118 (53.4)	49 (22.2)	2.76 (1.11)
	I10 Technical problems or troubleshooting makes me feel tense.	25 (11.3)	85 (38.5)	16 (7.2)	71 (32.1)	24 (10.9)	3.80 (0.99)
	I11 Using technology to teach is enjoyable for me.	24 (10.9)	120 (54.3)	33 (14.9)	43 (19.5)	1 (0.5)	2.92 (1.26)
Contextual Factors 2.77 (0.61)	I12 I am expected to be knowledgeable in uses of technology.	31 (14.0)	128 (57.9)	22 (10.0)	37 (16.7)	3 (1.4)	2.33 (0.96)
	I13 In my school, most teachers use	30 (13.6)	104 (47.1)	25 (11.3)	51 (23.1)	11 (5)	2.59 (1.13)

	technology when teaching.						
	I14 I know of many PE teachers who use technology to teach.	13 (5.9)	84 (38)	42 (19)	68 (30.8)	14 (6.3)	2.94 (1.09)
	I15 I have enough technology equipment appropriate for my class size	11 (5.0)	60 (27.1)	21 (9.5)	83 (37.6)	46 (20.8)	3.42 (1.23)
	I16 I can easily access technology resource personnel in my school.	35 (15.8)	101 (45.7)	21 (9.5)	52 (23.5)	12 (5.4)	2.57 (1.17)
	I17 My suggestions for staff development activities are valued by administrators	16 (7.2)	84 (38.0)	69 (31.2)	44 (19.9)	8 (3.6)	2.75 (0.98)
Teaching Style 3.12 (0.46)	I18 Technology takes time away from more important concerns.	5 (2.3)	47 (21.3)	38 (17.2)	119 (53.8)	12 (5.4)	
	I19 Technology does not accommodate personal learning styles.	2 (.9)	20 (9.0)	61 (27.6)	125 (56.6)	13 (5.9)	3.39
	I20 It is difficult using technology to teach PE.	3 (1.4)	52 (23.5)	51 (23.1)	110 (49.8)	5 (2.3)	3.57
	I21 Technology use promotes student motivation/participation in PE class.	22 (10.0)	138 (62.4)	49 (22.2)	11 (5.0)	1 (.5)	2.24

In terms of the technology use, there are 9 levels as the predictors for the dependent variable general technology use. The regression analysis shows how those levels predict the general technology use. As Table 2 Model Summary shows, five levels are the predictors for the PE teachers' technology use. The variable *I examine new developments or goals and apply technology throughout* my curriculum *for instruction of PE* is the strongest level for PE teachers' general technology use, this level affect mostly the general technology use. And the second strongest variable is *I vary my use of technology for instruction in PE periodically within specific lessons or for related activities with other teachers.* The third strongest variable is *I am aware of technology to use for PE, but I do not use it- perhaps I even avoid it.* For the rest two *I am seeking information or learning about using technology for instruction in PE. I am frustrated or lack confidence in this area. I feel comfortable using technology, but I am putting little effort/thought toward technology use for teaching.*

Table 2 Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.435a	.189	.185	2.72
2	.489b	.239	.232	2.65
3	.529c	.280	.270	2.58
4	.556d	.309	.297	2.53
5	.570e	.325	.309	2.51

a. Predictors: (Constant), I examine new developments or goals and apply technology throughout my curriculum for instruction of PE.

b. Predictors: (Constant), I examine new developments or goals and apply technology throughout my curriculum for instruction of PE., I vary the use of technology for instruction in PE and work on how to use technology for student learning.

c. Predictors: (Constant), I examine new developments or goals and apply technology throughout my curriculum for instruction of PE., I vary the use of technology for instruction in PE and work on how to use technology for student learning., I am aware of technology to use for PE, but I do not use it- perhaps I even avoid it.

d. Predictors: (Constant), I examine new developments or goals and apply technology throughout my curriculum for instruction of PE. , I vary the use of technology for instruction in PE and work on how to use technology for student learning. , I am aware of technology to use for PE, but I do not use it- perhaps I even avoid it., I am seeking information or learning about using technology for instruction in PE. I am frustrated or lack confidence in this area.

e. Predictors: (Constant), I examine new developments or goals and apply technology throughout my curriculum for instruction of PE. , I vary the use of technology for instruction in PE and work on how to use technology for student learning. , I am aware of technology to use for PE, but I do not use it- perhaps I even avoid it., I am seeking information or learning about using technology for instruction in PE. I am frustrated or lack confidence in this area, I feel comfortable using technology, but I am putting little effort/thought toward technology use for teaching.

4.2 RQ2. What is the relationship between the attitudes of physical education teachers towards technology and their use of technology?

Through the correlation analysis, table 3 presents all correlations among the attitude and technology use factors. The attitude factors perception of importance/relevance and technology proficiency were positively correlated ($r=0.55$, $p <.01$). There also was a positive correlation between PE teachers' perceptions of relevance/importance and their teaching style ($r=0.279$, $p <.01$). The results also examined that a statistically significant relationship between PE teachers' perceptions of relevance/importance of technology and technology use. Technology use includes the factors of internet related tools, general computer/mobile software, general computer hardware, PE special computer/mobile software, and PE specific hardware. A significant

relationship also exists between teachers' attitudes and their technology use. There is a positive relationship between perception of importance/relevance and internet-related tools (r=0.443, p <.01), general computer/mobile software (r=0.479, p <.01), general computer Hardware (r=0.408, p <.01), PE special Computer/mobile software (r=0.349, p <.01), PE specific hardware (r=0.303, p <.01).

Similarly, there is also positively relationship between teachers' technology proficiency and internet related tools (r=0.403, p <.01), general computer/mobile software (r=0.556, p <.01), general computer hardware (r=0.315, p <.01), PE special computer/mobile software (r=0.368, p <.01), PE specific hardware (r=0.315, p <.01). This indicated that both perceptions of importance/relevance and technology proficiency are important indicators to contribute to efficient technology integration in educational settings. Additionally, contextual factors also have a significant relationship with internet-related tools (r=0.217, p <.01), general computer/mobile software (r=0.253, p <.01), general computer hardware (r=0.222, p <.01), PE special computer/mobile software (r=0.22, p<.01), PE specific hardware (r=0.158, p <.05). This shows that contextual factors such as budget, collegial support, lack of training, administrative support might influence on technology use. While a significant relationship is only found between teaching style and PE special computer/mobile software (r=0.27, p <.01) and PE specific hardware (r=0.222, p <.01).

Table 3 Pearson Correlation Coefficients Among Teachers' Attitude and Technology Use scales

	Perception of Importance/Relevance	Technology Proficiency	Contextual Factors	Teaching Style
Perception of Importance/Relevance	1	.550**	.137*	.279**
Technology Proficiency	.550**	1	.312**	.222**
Contextual Factors	.137*	.312**	1	.152*
Teaching Style	.279**	.222**	.152*	1
Internet Related Tools	.443**	.403**	.217**	.094
General Computer /Mobile Software	.479**	.556**	.253**	.129
General Computer Hardware	.408**	.315**	.222**	.063
PE special Computer /Mobile Software	.349**	.368**	.220**	.270**

PE specific Hardware	.303**	.315**	.158*	.222**

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

This current study employed regression analysis to examined furtherly the teachers' attitudes to predict technology use. The coefficients that were derived based on the hierarchical regression analysis that was carried out and identified in Table 4 reveal that figures of merit such as beta and significance (p-value) were estimated. For the dependent variable(factors) general computer/mobile software, there are two predictors. The first predictor is technology proficiency, and the other one is the perception of importance/relevance. As Table 4 shows that 'perception of importance/relevance'' ($t = 3.804$, $p < 0.001$) and ''technology proficiency'' ($t = 6.435$, $p < 0.001$) could significantly and positively predict ''general computer/mobile software,'' and they explained 35.3% of teachers' perceptions of ''general computer/mobile software'' when using technology integration. In addition, the employing of the standardized coefficient beta provides an indication of the performance of the variables, and using a value that is positive affords a better opportunity to analyze the quantitative data. Table 4 demonstrated the most important independent variable is technology proficiency with a best-standardized coefficient beta value of 0.420. The second important independent variable is the perception of importance/relevance with a standardized coefficient beta value of 0.248. Therefore, these two attitude variables both technology proficiency and perception of importance/relevance predict significantly general computer/mobile phone software, the standardized coefficient beta shows that technology proficiency is the strongest predictor. These results indicated that if PE teachers have technology proficiency towards technology use and have a positive perception of importance/relevance, it is likely they will highly use general computer/mobile software.

Similarly, ''perception of importance/relevance'' ($t = 4.468$, $p < 0.001$), 'technology proficiency'' ($t = 3.216$, $p < 0.01$) were significantly positive predictors for ''internet related tool.'' Totally, these factors accounted for 23.3% of the variance. Additionally, the standardized regression coefficients (Table 4) demonstrated that perception of importance/relevance is the strongest predictor with a best-standardized coefficient beta value of 0.317, followed by technology proficiency with a standardized coefficient beta value of 0.228. This indicated that if PE

teachers have a positive perception of importance/relevance towards technology use and have technology proficiency, it is likely they will highly use internet related tools. The general computer hardware has two predictors, ‘‘Perception of importance/relevance’’ ($t = 6.266$, $p < 0.001$), ‘‘Contextual Factors’’ ($t = 2.764$, $p < 0.01$) were significantly positive predictors for ‘‘General computer hardware.’’ Totally, these factors accounted for 19.4% of the variance. Additionally, perception of importance/relevance with a best-standardized coefficient beta value of 0.317, which suggested that both independent variables indicate teachers use the general computer hardware. However, compared with contextual factors, perception of importance/relevance is the strongest predicator for the general computer hardware. Lastly, Table 4 demonstrates that there are no data to prove independent variables of teaching style can predict internet related tool, general computer/mobile software, and teachers' general computer hardware.

PE special computer/mobile software has three positive predictors, ‘‘technology proficiency’’ ($t = 3.205$, $p < 0.01$), ‘‘teaching style’’ ($t = 2.667$, $p < 0.01$), and ‘‘perception of importance/relevance’’ ($t = 2.321$, $p < 0.05$) were significantly positive predictors for ‘‘PE special computer/mobile Software.’’ Totally, these factors accounted for 19.3% of the variance. Similarly, ‘‘Technology proficiency’’ ($t = 2.645$, $p < 0.01$), ‘‘teaching style’’ ($t = 2.045$, $p < 0.05$), ‘‘perception of importance/relevance’’ ($t = 2.022$, $p < 0.05$) were positive predictors for ‘‘PE specific Hardware.’’ Totally, these factors accounted for 14% of variance and indicated that if PE teachers with technology proficiency and positive perception of importance/relevance have a teaching style, it is likely they will use the PE special computer/mobile software and PE specific hardware. In total, those three dependent variables were positively associated with PE special computer/mobile software. Among the three dependent variables, technology proficiency with a standardized coefficient beta ranging between 0.235 - 0.200, which is higher compared the standardized coefficient beta of the other two dependent variables. It indicated that technology proficiency is the strongest predictor for the PE special computer/mobile software and PE specific hardware. The results of this study also demonstrated that teaching style only predicts and affects PE special computer/mobile software and PE specific hardware**.** It indicated that teachers with a student-centered teaching style might use more PE special computer/mobile software and hardware.

Table 4 Stepwise regression model of predicting teachers' perceptions of technology integration (n = 221)

Dependent variables	Predicting variables	B	S.E	β	t	R^2
General Computer/ mobile software	Technology Proficiency	.361	.056	.420	6.435***	.310
	Perception of Importance/Relevance	.381	.100	.248	3.804***	.353
Internet related tool	Perception of Importance/Relevance	.433	.097	.317	4.468***	.196
	Technology Proficiency	.175	.054	.228	3.216**	.233
General Computer Hardware	Perception of Importance/Relevance	.548	.088	.384	6.266***	.166
	Contextual Factors	.190	.069	.170	2.764**	.194
PE special Computer/Mobile Software	Technology Proficiency	.201	.063	.235	3.205**	.135
	Teaching Style	.345	.129	.170	2.667**	.173
	Perception of Importance/Relevance	.264	.114	.173	2.321*	.193
PE specific Hardware	Technology Proficiency	.191	.072	.200	2.645**	.099
	Teaching Style	.303	.148	.135	2.045*	.124
	Perception of Importance/Relevance	.264	.131	.155	2.022*	.140

***p <.001; **p < .01; *p < .05

Table 5 shows the correlation that exist between the kind of professional development or training and the use of technology. Professional development or training are some Basic computer literacy (Internet, emails and so on), Basic computer applications (word processing, PowerPoint), Advanced computer applications (fitness software, website design), Computer integration (implementing technology throughout your curriculum). There is statistically significantly and positive correlation between General computer/mobile software and advanced computer application (fitness software, website design) ($t = 0.249$, $p < 0.01$). If PE teachers receive advanced computer application training, they will have more usage of general computer/mobile software. There is also a statistically significantly and positive correlation between internet related tools and advanced computer applications (fitness software, website design) ($t = 0.177$, $p < 0.01$). PE teachers have advanced computer application training, internet related tools will be highly employed in their teaching.

There is a small positive correlation between general computer hardware and advanced computer application (fitness software, website design) ($t = 0.135$, $p<0.05$). PE special computer/mobile software ($t = 0.070$, $p>0.05$) and PE specific hardware ($t = 0.03$, $p >0.05$) have not any correction with advanced computer applications (fitness software, website design). Besides, the other three professional development or training in basic computer literacy (Internet, emails and so on), basic computer applications (word processing, PowerPoint), and computer integration (implementing technology throughout your curriculum) have no correlations with the technology use variables. Therefore, PE teachers receive/have advanced computer application training, they will have more usage in internet-related tools and general computer/mobile software, and general computer hardware. Thus, technology training is important to promote teachers to use ICT tools. Special PE software and hardware might have other reasons to promote to use but not training itself enough. It might be related to that if the teachers have the possibility of access to those special technologies or not.

Table 5 Pearson correlation between technology training and technology use

Variables	Internet Related Tools	General Computer /Mobile Software	General Computer Hardware	PE special Computer /Mobile Software	PE specific Hardware
Basic computer literacy (Internet. emails and so on)	-.048	-.091	.044	-.060	-.105
Basic computer applications (word processing. PowerPoint)	-.040	-.044	.044	.026	-.060
Advanced computer applications (fitness software. website design)	.177**	.234**	.135*	.074	.030
Computer integration (implementing technology throughout your curriculum)	.096	.111	.120	-.020	-.063

4.3 RQ3. What are the factors affecting PE teachers' attitudes and their technology integration into their teaching

4.3.1 Barriers to technology integration in terms of attitude factors and technology use factors

The Pearson correlation analysis was performed to describe the relationship between the barriers and teachers' attitudes, between barriers and technology use of this study. Barriers' scales are budget, collegial support, lack of training, administrative support, class size, and internet down/unavailable.

Firstly, there is a strong negative correlation relationship between administrative support and general computer/mobile software ($r=-0.265$, $p<.01$), PE special computer/mobile software support ($r=-0.262$, $p<.01$), PE special hardware ($r=-0.191$, $p<.01$), and a negative-positive relationship also exist between administrative support and internet related tools ($p<.05$). This indicated that administrative support significantly affects PE teachers using of general computer/mobile, PE special computer/mobile software, PE special hardware, and internet related tools. If school administrators do not provide sufficient support for teachers, they are unable to

successfully integrate technology into the teaching and learning process. Thus, the findings revealed that administrative support is an extremely significant factor in terms of making use of technology. In terms of the attitude factors, a very strong correlation was found between administrative support and technology proficiency (r =-0.461, p <.01). Similarly, a small correlation relationship was examined between administrative support and contextual factors (r=0.146, p <.05 P=.030), and teaching style (r =0.142, p <.05 p = .035). This revealed that if there is an increase in the amount of administrative support that is provided, then PE teachers will become more proficient and skilled in the integration of technology.

Secondly, among the attitude factors there is a correlation relationship between perception for importance/relevance and collegial support (r =- 0.232, *p* <.01). Without the support of their colleagues, PE teachers might have a less positive perception or negative perception towards the use of technology. Thus, the positive attitude that physical education instructors have toward technology is linked to the collegial support they receive. In terms of the technology use factors, there is a correlation relationship between collegial support and general computer/mobile software (r=-0.172, p <.05 p=.010), general computer hardware (r=-0.166, p <.05 p =.014), and PE special hardware (r=-0.140, p <.05 p=.038). For PE teachers, the support from colleagues will affect their use of general computer/mobile software, general computer hardware, and PE special hardware and internet related tools. The findings highlighted the significance of collaboration between colleagues in ensuring the successful implementation of technologies. On the other hand, physical education teachers will improve their awareness of the significance of utilizing technology, particularly when their peers offer support with many aspects of these technologies, including general computer/mobile software, general computer hardware, as well as PE-specific hardware and internet-related tools.

Thirdly, there is a strong negative correlation relationship between lack of training and general computer hardware (r=-0.175, p <.01 p=0,009), and a small negative positive correlation relationship between lack of training and PE special hardware (r=-0.141, p <.05 P=0,036). This revealed that more training may contribute to the use of technology, such as enhancing the use of general computer hardware and PE-specific hardware. Regarding the attitude factors, there is a correlation relationship between perception for importance/relevance and lack of training (r=-0.233, *p* <.01). This shows that the PE teachers receive less training or lack of training, they

will have a less perception for importance/relevance. This implies that the more technology-related training PE educators acquire, the more positive their attitudes toward technology use increase.

Lastly, there is a negative-positive correlation between contextual factors and budget (r=-0.230, p <.01). This pointed out that if the schools provide a sufficient budget, it will be simple to gain access to various technological instruments, which will make it easier for PE teachers to effectively integrate technology into their lessons. It was found that a small positive relationship examined between internet down/unavailable and PE special hardware and PE special computer/mobile (p <.05). However, no correlation was found between any of the five technology use factors, attitude factors and class size (p <.05). This means that class size is not a barrier and does not influence the attitudes of teachers or the implementation of technology in this study. It might be due to that, in Finland the class size in PE class is usually quite small around 10-25 students in each classroom.

Table 6 Correlation between teachers' attitudes, technology use and barriers' variables for technology use

Variables	Budget	Class size	Administrative support	Internet down/unavailable	Lack of training	Collegial support
Perception for importance/relevance	.139*	.058	-.107	.066	-.233**	-.232**
Technology proficiency	-.100	-.009	-.461**	-.067	.022	-.128
Contextual factors	-.230**	-.123	-.146*	-.118	.111	.073
Teaching style	.089	-.028	-.142*	.067	.052	.031
Internet Related tools	.054	.012	-.133*	.027	-.124	-.104
General computer/ mobile software	.014	.064	-.265**	.013	-.071	-.172*
General Computer hardware	.026	-.035	-.118	-.014	-.175**	-.166*
PE special computer/mobile software	-.018	-.022	-.262**	.135*	-.076	-.107
PE special Hardware	.059	.012	-.191**	.139*	-.141*	-.140*

***p <.001; **p < .01; *p < .05

Table 7 shows the results of correlation analysis on the frequency of technology use and the general technology use relationship. There are a totally 13 variables for the frequency of technology use, most of the variables have correlations with general technology use. Nine out of 13 variables were highly corrected with general technology use. There are statistically significant and negative correlations between general technology use and the use of a computer at home software (r=-0.438, p <.01), the use a computer while at work (r=-0.368, p <.01), use any technology to teach physical education content (r=-0.209, p <.01), Review, select, or purchase technology products (r=-0.271, p <.01), serve on a committee involved with technology issues (r=-0.319, p <.01), help other teachers use computers or other technology (r=-0.29, p <.01), rely on technology for daily preparation or routine tasks (r=-0.18, p <.01), give class/homework assignments that require technology use (r=-0.29, p <.01), use the internet to acquire teaching resources (r=-0.18, p <.01). Use a computer at home and use a computer while at work both have a strong negative correlation with general computer use. It indicated that if PE teachers use computers more frequently at home, their using of general technology will be increased. Similarly, PE teachers use technology often while at work which means more general technology use will be integrated into their teaching. While two variables (use email) (p <.05) and (discuss technology or the Internet with other teachers) (p <.05) have small correlations with general technology use, two variables (use a computer during instruction in physical education) and (use the Internet) have no relationship with general technology use.

Table 7 Correlation between frequency of technology use and the general technology use relationship

Technology use factors	General Technology Use
Use a computer during instruction in physical education?	-.109
Use email	-.141*
Use the Internet	-.093
Use a computer at home	-.438**
Use a computer while at work	-.368**
Use any technology to teach physical education content	-.209**
Review, select, or purchase technology products	-.271**
Serve on a committee involved with technology issues	-.319**
Discuss technology or the Internet with other teachers	-.153*
Help other teachers use computers or other technology	-.290**

Rely on technology for daily preparation or routine tasks	-.180**
Give class/homework assignments that require technology use	-.290**
Use the Internet to acquire teaching resources	-.180**

***p <.001; **p < .01; *p < .05

4.4 RQ6. What are the differences in attitudes toward technology use between female and male PE teachers?

T-tests were performed to determine whether there is a correlation between attitudes, technology use, and gender. The values in table 8 indicated that among the four attitude factors, three attitude factors showed a statistically significant correlation with gender. One attitude factor has no significant correlation with gender. For technology proficiency, males PE teachers(M=3.65) have a statistically significant higher mean score than females PE (M=3.28), (t= -2.891, p= .0050). Male PE teachers have a statistically significant higher mean scores (M= 3.43) for contextual factors than PE females (M=3.16), (t= -3.215, p= 0.02). As to teaching style, males PE teachers (M=3.00) have a statistically significant higher mean score than females PE teachers (M=2.70), (t=-3.215, p=0.02). Also, male PE teachers (M=3.75) have almost the same mean score as females PE teachers (M=3.79), (t= -.391, p= .657) for the perception of importance/relevance variable. As such no significant correlation was identified for gender, revealing that female PE teachers and male PE teachers have the same perceptions of relevance/importance of technology towards technology use. In conclusion, except for importance/relevance and gender, the findings indicated that gender constitutes a significant variation in terms of technology proficiency, contextual factors, and teaching style towards the use of technology.

For the technology use factors, as can be seen in Table 8 males PE teachers (M=2.34) have a statistically significant higher mean score than females PE teachers (M=2.06), (t= -2,376, p=

.020) for PE special computer/mobile software. There has a significant correlation relationship between female and male PE teachers in terms of PE special computer/mobile software. However, regarding the rest of the technology use variables, no correlations were found with gender differences. For internet related tools, males PE teachers (M=3.44) have almost same mean score as females PE teachers (M=3.47), (t= .297, p=0.767). Similarly, for both general computer/mobile software and general computer hardware, male and female PE teachers' mean scores are almost the same and there are no statistically significant differences with gender (p>0.05). The last variable PE specific hardware, although males PE teachers(M=2.61) have a bit higher mean than females PE teachers(M=2.38), (t= 1.807, p=0,074), unexpected results present that, there are no statistically significant differences with the gender (p>0.05).

Table 8 Independent Samples t-test attitude and technology use towards gender

Factors	Gender	n	M	SD	SE	df	t	p
Perception of importance/ Relevance	female	161	3.7560	.43526	.03430			
	male	60	3.7881	.57715	.07451	85.249	-.391	.657
Technology Proficiency	female	161	3.2826	.83345	.06568			
	male	60	3.6500	.84272	.10879	104.722	-2.891	.0050
Contextual Factors	female	161	3.1604	.61743	.04866			
	male	60	3.4308	.53155	.06862	121.886	-3.215	0.02
Teaching Style	female	161	3.2717	.36271	.02859			
	male	60	3.4042	.33538	.04330	113.677	-2.552	0.12
Internet Related Tools	female	161	3.4697	.62526	.04928			
	male	60	3.4385	.71956	.09289	94.128	.297	0.767
General Computer/Mobile Software	female	161	3.2469	.72510	.05715			
	male	60	3.3333	.75059	.09690	102.600	-.768	0.444

General	female	161	3.5503	.66296	.05225			
Computer Hardware	male	60	3.4733	.72623	.09376	97.857	-2.376	0.475
PE special	female	161	2.0583	.68626	.05409			
Computer/ Mobile Soft-ware	male	60	2.3362	.80348	.10373	92.909	-2.376	0.020
PE specific	female	161	2.3841	.78485	.06185			
Hardware	male	60	2.6139	.86111	.11117	97.731	1.807	0.074

5 Discussion

This current study is the first research conducted in Finland by investigated 221 PE teachers using quantitative analysis to identify the relationship between their attitude and technology integration with the regression analysis; to examine obstacles to technology integration with different technology variables; to investigate if the gender of PE teachers affects their intention to integrate technologies into their teaching.

Previous studies showed that perception plays an important role in general technology use, but not comprehensively analysis from specific use of technology. This current study specifically indicated that PE teachers with a positive perception of importance/relevance and technology proficiency will be likely to use technologies such as general computer/mobile software and internet-related tool for their teaching. Also, PE teachers with a positive perception of importance/relevance have less limitations accessing to technology will likely integrate general computer hardware for their teaching. Lastly, PE teachers with technology proficiency and positive perception of technology have more student-centered teaching style. Most importantly such teachers will probably employ the PE special computer/mobile software and PE specific hardware in their classroom.

Identified obstacles such administrative support, collegial support, and lack of training restrict the use of technology. Particularly, less administrative support is related to less use of internet related tools, general computer/mobile software, PE special computer/mobile software, and PE special hardware. These results are different from many previous studies that administrative support only contributes to the technology integration but not specifically to the factors of technology. This study suggested that male PE teachers are more competent and confident in their use of specifically PE special computer/mobile software compared to female PE teachers. All those research gaps might bring new insight into administrators and principals to develop curriculum and strategies to integrate technology effectively in PE teaching in the context of Finland.

5.1 Physical education teachers' attitudes towards integrating technology in K-12 context in Finland

The findings of this study demonstrated an overall positive attitude for physical education teachers based on mean scores for each attitude factor toward technology use are consistent with many of the previous studies indicated that positive attitudes are held by educators toward the implementation of ICT in the classroom (Kale & Goh, 2014; Makhlouf & Bensafi, 2021). In this study, the attitude of each factor takes high percentages ranging from 55.2%-90%, which indicates a positive attitude towards technology use.

For the factor perception of importance/relevance, most of the PE teachers responded that following the acquisition of new technological knowledge, they attempt to execute it in their teaching. It indicated that PE teachers are eager to apply what they have learned from the technology to the classroom since they expressed that they will try to put that knowledge into practice, after gaining some knowledge about a technological topic. Many educators in the field of physical education have said that they will take technological advances into account when revising the curriculum. The results of the current study are consistent with the findings of previous studies on the acquisition of new technological skills from training has an impact on how instructors make use of technology in their classes (Zyad, 2016). Additionally, many PE instructors believe that the use of technology may enhance the overall quality of physical education, which indicates that they value the application of technology and the benefits it offers in the classroom. This result supports the statement that the perceived value and relevance of technological integration for teaching have been proven to affect instructors' use of technologies (Krause, 2017).

Also, for contextual factors, three out of six attitude items had low percentages ranging from 32.1%-45.2%. These percentages are a bit low because only 32.1% of teachers agreed that they have enough technology equipment appropriate for their class size. This result is similar to the findings from the study conducted by Waller et al. (2022) that class sizes were one factor preventing the use of technology in the classroom, many educators working in public schools are of the opinion that excessively large class sizes impede learning. Generally, the PE teachers who participated in this study have a positive attitude toward technology use, they have the willingness to use technology for teaching if there are enough technology resources. Exactly 43.9% of respondents know of many PE teachers who use technology to teach, this statement

indicated that the colleague might play an important role to promote technology use among other teachers. This may be because learning between colleagues occurs most effectively in situations involving practical work, providing support to coworkers has been shown to be beneficial (Kaarakainen et al., 2017). Close to half of the teachers 45.2% reported that their suggestions for staff development activities are valued by administrators. Here indicated that they are willing to learn and use the technology in school and they even give their feedback and suggestions based on the experiences they have used the technology for staff development. Therefore, administrators should value the technology used by PE teachers, as the study showed that positive attitudes toward the incorporation of ICT in educational settings are associated with educators who are provided both enough technical help and the motivational backing of administrators (Chigama & Goronga, 2022; Tezci, 2011).

In the teaching style factor, physical education teachers demonstrated that 72.4% of technology use promotes student motivation/participation in PE class, which indicated that PE teachers perceive technology is very important and can help to increase the motivation of the students and the teaching quality. For example, Christensen (2002) suggested the attitudes of teachers and their readiness to adapt to new technologies are the most important factors in determining the level of success that students experience when learning using computer technologies. The teaching style attitude factor ranges from 18%-24.9% showing that fewer teachers agree with the negative sides of technology, which means PE teachers believe that the use of technology is not difficult and combining technology with teaching is a win-win situation in learning and teaching.

Although nine variables described the teacher's current perceptions in terms of general technology use, the results of the regression analysis show that I examine new developments or goals and applying technology throughout my curriculum for instruction of PE, is the strongest predictor of PE teachers' general technology use. The results of correlation analysis indicated that teachers use a computer at home affects general technology use. This finding is in line with Christensen & Knezek (2001) who found that access to technology at home is a crucial factor in determining the level of technological integration achieved by educators. Similarly, teachers who have made more frequent use of technology in their personal lives are more likely to

include it in their lessons than teachers who have made less frequent use of technology in their everyday lives (Swallow & Olofson, 2017).

In addition, use a computer while at work, use any technology to teach physical education content, use the Internet to acquire teaching resources, and so on, which will promote teachers' general technology use and this result is consistent with Wozney et al. (2006) who found a relationship between the frequency of integration, the proficiency of the instructors, and the phase of integration for the teachers. However, the use a computer during instruction in physical education and (the use the internet?) had no relationship with general technology use. This might because using of a computer and internet is so common so that it will not influence the general technology use.

5.2 The relationship between the attitudes of physical education teachers towards technology and their use of technology

According to the results from correlation and regression analysis, the attitude factors are intercorrelated. In addition, relevance/importance of technology, teachers' technology proficiency, and contextual factors are correlated with all the five factors of technology use. However, a significant relationship was only found between teaching style and PE special computer/mobile software and PE specific hardware. In general, the results of this study are consistent with Gibbone et al. (2010) that all attitude factors are corrected with technology use. It is worth mentioning this study indicated teaching style only contributes to the use of PE special computer/mobile software and PE specific hardware and is inconsistent with the findings of Gibbone et al.

Firstly, the results of the regression analysis study identified that if physical educators with a positive perception of importance/relevance and technology proficiency, it is likely they will use general computer/mobile software and internet-related tool for their teaching. This result is consistent with the former studies that attitude also encompasses a person's level of technical proficiency (competence), confidence in their technological skills, and knowledge; those can in turn determine how they put those skills into practice (Teo, 2008; Wozney et al., 2006). Additionally, this result is also supported by several studies have shown that the importance of

computer skills is one of the most significant predictors of teachers' attitudes regarding the implementation of ICT in educational settings (Abu Samak, 2006; Makhlouf & Bensafi, 2021).

Secondly, this study also demonstrated that perception of importance/relevance and contextual factors are important indicators to contribute to the general computer hardware. This suggests that if physical educators with a positive perception of importance/relevance have less or no barriers or limitations accessing to technology, they are likely to use general com-puter hardware such as LCD projector, smart board, digital camera/video (eg smartphone camera), educational CD ROM'S or DVD's, and wireless microphone. for their teaching. These kinds of computer hardware should also have been provided and made accessible to the teachers by the school or administrators. Otherwise, the amount of teaching and learning that can be carried out with the aid of technological tools for instruction is restricted (Ertmer 1999). Conversely, even if physical education teachers have access to technology resources, it is unlikely that they will use those resources to teach because the decision to use technology in the classroom is typically influenced more by the educator's own feelings than by the simple fact that the necessary tools are available (Hernández-Ramos, 2005; Johnson & Howell, 2005).

Thirdly, the findings of this study also indicated that if PE teachers with technology proficiency and a positive perception of importance/relevance have a teaching style, it is likely they will use the PE special computer/mobile software and PE specific hardware. The results of this study demonstrated that teaching style predicts and affects PE instructors' technology use in terms of the PE special computer/mobile software and PE specific hardware**.** This is in line with previous study, which found that educators who tend to have a more student-centered viewpoint are the ones who make use of technology in the classroom such resources are made available (Becker, 1999). In addition, this result is similar to the findings of (Kale & Goh, 2014) where there was a substantial positive association between the teaching style of the educator and the possibility of finding Web 2.0 appealing for educational purposes, student-centered learning, and acceptability of the use of Web2.0 in the classroom. If the PE teachers perceive that the usage of technology helps students become more motivated and participate more actively in a physical education class, then it is likely that such teachers will be more inclined to use technology in their lessons than those who do not.

Interestingly, the correlation and regression analysis demonstrated that the perception of importance/relevance and technology proficiency was the most significant positive predictors of technology use. When teachers have a higher perception of importance/relevance toward technology use, there is an increased likelihood to integrate technologies into their teaching in the classroom (Krause, 2017). Besides, teaching style, perception of importance/relevance, and technology proficiency are essential variables for predicting PE instructors' technology use specifically for the PE special computer/mobile software and PE-specific hardware in the stepwise regression.

5.3 Factors contributing to the attitude and technology integration into their teaching

The Pearson Product Moment performed shows a relationship between the barriers and teachers' attitudes toward technology use. The results of this study illustrated that obstacles that mainly contribute to PE teachers' technology use are collegial support, lack of training, administrative support, and internet down/unavailable. However, the class size is identified not to influence PE teachers' attitudes.

Firstly, the study demonstrates a significant negative correlation between contextual factors and budget. These results indicated that more budget would reduce the contextual factors that can affect the integration of technology in educational settings. In addition, it implies that if the schools do have not enough budget, technology-related tools/facilities such as software and hardware would not be available for PE teachers in their classrooms. Financial restrictions might be responsible for the failure of technological integration, especially considering how costly both software and hardware are for teaching in the PE class. The result of this study is consistent with many previous studies such as Pyle & Esslinger (2014) who found that a major challenge that the physical education class contends with is the deficiency in resources especially insufficient infrastructure and technological equipment. When budgets for physical education are limited, there is cause for concern because of the cost of equipment as well as its impact on the budget (Thomas & Stratton, 2006). The findings of this study show that the budget is essential in determining whether physical education teachers can use technology in their classrooms or not. Therefore, schools should pay attention to supporting the purchase of

technology-related equipment because if physical education budgets do not support technology use, it will affect the purchase decisions on purchasing equipment and its usage subsequently.

Secondly, the results of the study indicated a negative strong correlation between teachers' perception for importance/relevance and lack of training. This result is in line with Makhlouf & Bensafi (2021) stated that the more training PE educators acquire, the more favorable their attitudes toward technology use increase. Various studies also find the lack of training to be a large obstacle to technology integration in the teaching of PE (Cuckle & Clarke, 2003; Grainger & Tolhurst, 2005; Villalba et al., 2017). In addition, in terms of technology use, there is a strong negative correlation relationship between lack of training and general computer hardware. While a small negative relationship also exists between lack of training and PE special hardware. Those results are consistent with the findings of previous studies on training has an impact on how instructors make use of technology in their classes (Zyad, 2016). Lastly, the Pearson correlation shows that professional development or training affects technology use.

Finnish teachers already have technology use experiences in terms of basic technology skills on training covers basic technology skills such as basic computer literacy (Internet, emails and so on), and basic computer applications (word processing, PowerPoint), which may not necessarily influence the technology use. However, by providing advanced training on computer applications, they might have more general technology use such as internet-related tools, general computer/mobile software, and general computer hardware ($p < 0.01$-0.05). The study also indicated computer integration (implementing technology throughout your curriculum) does not correlate with technology use. The reason could be that the training for technology use might not be the only factor to affect teachers' attitudes to using technology but rather, how the teacher integrate technology into their teaching based on the curriculum which might be related to their attitude, administrative support, budget, and so on.

Thirdly, there is a correlation relationship between the perception for importance/relevance and collegial support. This implies that if PE instructors have less collegial support, it can affect their perception for importance/relevance. Also, it is likely that if PE teachers do not provide each other with information or some support, it will affect the perceptions of some teachers negatively. However, if they are encouraged to use technologies, their perception will be positive. The result of this study shows a small correlation relationship between collegial support

and general computer/mobile software, general computer hardware, and PE special hardware. Teachers need to have more opportunities to increase their technology competency through hands-on experience made available to them. This will help instructors to acquire the needed skill or get support from another person. Finnish schools use a lot of the tutor-teacher model, where teachers work in pairs and reflect on opportunities and problems of technology together (Preradović et al., 2017). This way of supporting colleagues has proven to be useful because learning between colleagues takes place where there is practical work (Kaarakainen et al., 2017).

As to technology use such as general computer/mobile software, general computer hardware, and PE special Hardware, PE teachers can support each other in the same working environments. Research results are consistent with a previous study (Adams, 2005) that showed the use of computers together with other teachers was the most important variable associated with teachers' skillful use of technology. In addition, the use of technology by colleague physical instructors can have a considerable impact on the perspectives and actions of teachers who are considering integrating technology into their teaching and learning (Adams, 2005; Albion & Ertmer, 2002; Zhao & Frank, 2003). It is worth mentioning that some PE instructors may have the knowledge and skills of internet-related tools and hence will not need any support. However, in terms of PE special computer/mobile software, it might be challenging to use during teaching due to the lack of PE special technology-related knowledge and confidence. If colleagues do not have such knowledge or training, it would be difficult to support each other.

Fourthly, there is a very strong correlation between technology proficiency and administrative support. In some research, except for insufficient technological resources, a lack of available time, and concerns regarding the content of the curriculum, administrative support was also identified as a significant obstacle to technology integration in the teaching profession (Makhlouf & Bensafi, 2021). The possession of a computer, the perception of adequate administrative support, and the number of years of expertise all contribute to a reduction in anxiety(Hong & Koh, 2002). One of the factors that can influence teachers' usage of technology is the amount of administrative support they receive. PE teachers might have access to sufficient technological resources and training when they are given the needed administrative support. This will

allow them to improve their technology-related abilities, proficiency, and knowledge in educational environments.

In terms of general technology use, there is a strong negative correlation relationship between administrative support and general computer/mobile software, PE special computer/mobile software support, and PE special hardware. Also, there was a small negative-positive relationship also exists between administrative support and internet-related tools. Therefore, this result indicated administrative support significantly affects PE teachers' use of technology. It is consistent with previous studies showed that the perceptions of educators are influenced by administrative support (Dwyer et al., 1991; Migliorino & Maiden, 2004). Administrative support might play a crucial role in integrating technology across all academic subjects(Makhlouf & Bensafi, 2021). It is more likely that teachers will incorporate the use of technology into their teaching if the school administration assists the teachers in their classrooms. Furthermore, it is essential for physical educators to bring to the attention of administrators and members of technology committees to the technological requirements of the PE department (Pyle & Esslinger, 2014).

The result of this research also showed no relationship between technology use and class size. This result was no in line with the findings of the previous studies, which revealed class size as the most significant obstacle to the use of technology in physical education Waller et al., (2022). Lastly, there was a small positive relationship between the internet down/unavailable and PE special hardware and PE special computer/mobile software. Many of the physical education classes take place outside of the school most of the time. For example, even if students have their mobile phones, it does not guarantee they will all students have access to the internet or that all educational applications (such as the orientation app, Pokémon Go, Jungle Race, and so on) can be successfully installed on their phones.

In sum, identified obstacles such as lack of training, administrative support, collegial support, and budget restrict the use of technology in physical education instruction. Specifically, the teachers' use of technology, such as PE special hardware and PE special computer/mobile software, will be impacted by the down/unavailable internet.

5.4 Attitude difference toward technology use between female and male physical education teachers

The current study discovered that the perceptions of Finnish PE teachers on the implementation of technological tools varied significantly depending on the gender of the teacher. The findings indicated that gender constitutes a significant variable in terms of technology proficiency, contextual factors, and teaching style toward the use of technology.

Interestingly, the Perception of importance/relevance has no significant correlation in terms of gender, revealing that female PE teachers and male PE teachers have the same perceptions of relevance/importance of technology towards technology use. Also, males PE teachers(M=3.00-3.65) had a statistically significant higher mean score than females PE (M=2.7-3.28) for technology proficiency, contextual factors, and teaching style. This could predict that male physical instructors' attitudes and perceptions towards technology use were more positive compared with female physical instructors. This result is aligned with past findings of a similar study that revealed men preservice teachers had more favorable views about technology than female preservice instructors (Akturk et al., 2015). The result is also consistent with (Hsu et al., 2017; Woods et al., 2008) who found that on average, men believed that they have better ICT skills than female teachers when evaluating themselves.

For the technology use factors, males PE teachers have a statistically significant higher mean score than females PE teachers for PE special computer/mobile software. It indicated there has a significant correlation relationship between female and male PE teachers in terms of PE special computer/mobile Software. This research result is consistent with (Ilomäki & Lakkala, 2011) men have used more different technological applications, which are not so common. It might imply that when compared to their male colleagues, female physical education teachers have remained committed to the use of more traditional technological methods, such as videos and basic computer programs. For the internet related tools, general computer/mobile software, general computer hardware, and PE specific hardware, there are no correlations were found with gender differences. The research result is contrary to the study of Yaman (2008), that female physical education teachers make considerably more use of technological tools and technology-related learning and teaching approaches than male ones do; some examples of these strategies include instructional games, practice, and behavioral methods. The more well-known

technological practices could be understood as internet related tools, general computer/mobile software, general computer hardware, and PE specific hardware. As internet related tools include email, internet search engines (Google, Bing, etc.), email with an attachment (picture or document), instant messages or chat groups (eg FB messenger, FB groups, WhatsApp, etc.), and so on. Additionally, there is no gender difference in the technology use of internet-related tools, and this can be explained by (Ilomäki & Lakkala, 2011), the use of communication technology, for example, e-mail is common in both male and female teachers. This result is also consistent with Makhlouf & Bensafi (2021) and suggests democratization process of technology promote men and women having equal opportunities of using the computer and the internet, which allows them to acquire favorable views toward technology.

Finally, male PE teachers tend to use more PE special computer/mobile software than female PE teachers and have a more positive attitude than female PE instructors. This supports recent research conducted in Finland, where technological incompetence was concentrated in middle-aged female teachers (Kaarakainen et al., 2017). Makhlouf & Bensafi, 2021 had the same conclusion that female PE teachers were seen being less technology competent. The reason for gender differences may be, for example, men's greater motivation and interest in technology or men's greater self-confidence in technology skills (Ilomäki & Lakkala, 2011). As above mentioned, male PE instructors' technology proficiency and teaching style have higher mean than female PE instructors. Technology proficiency might play an important role to increase male PE teachers' confidence in terms of using technology. This could be because males are naturally skillful, confident, and willing to experiment with emerging forms of technology in terms of teaching. As a result, male PE teachers were likely to integrate more technology in the classroom, which might explain why male teachers' teaching style has a higher mean than female teachers in this research.

To address the gap between male and female PE teachers, more resources and attention should be dedicated to training female teachers to use technology, especially the special computer/mobile software in their teaching in the future. This is in line with the findings of Seneviratne (2017) which shows that female teachers should be assisted to integrate ICT into PE, acquiring strategies for this purpose considering their needs without the involvement of male colleagues

may be particularly effective. This can improve information technology use and computational thinking among girls.

6. Conclusion, Limitations and Future Implications

It can be concluded that PE teachers hold an overall positive attitude toward technology integration. The results of this study clearly demonstrated that if physical educators with a positive perception of importance/relevance have technology proficiency, they likely will use general computer/mobile software and internet-related tool for their teaching. Further, this study also shows that perception of importance/relevance and contextual factors are important indicators to contribute to the general computer hardware. This indicated that if physical educators with a positive perception of importance/relevance have less or no barriers or limitations to accessing technology, they might use general computer hardware for their teaching. Another important conclusion is that, if PE teachers with technology proficiency and a positive perception of importance/relevance, they are more likely to use the PE special computer/mobile software and PE specific hardware. Teachers with the student-centered method teaching style might integrate PE special technology in their classrooms. Overwhelmingly, perception of importance/relevance in technology and technology proficiency was the most significant positive predictor of technology integration. When teachers have a higher perception of importance/relevance toward technology use, it is more likely that they will be willing to integrate technologies into their teaching in the classroom, as suggested by previous studies (Krause, 2017).

The identified obstacles include administrative support, collegial support, and lack of training to restrict the use of technology in physical education instruction. It is worth mentioning that class size does not limit the technology use. Also, sufficient training can improve teachers' perception for importance/relevance and technology use. Besides the training, collegial support, and administrative support play the most important roles to promote PE teachers' technology proficiency and technology integration. Therefore, administrators in the school should pay greater attention to the benefits of technology in PE teaching, and provide all kinds of technology resources, and suitable and professional training to support the integration of technology in PE classes.

As to gender, the findings indicated that even though female PE teachers and male PE teachers have the same perceptions of relevance/importance of technology towards technology use, male PE teachers are more confident and competent in using technology in their teaching. In Finland,

the number of female PE teachers is noticeably higher than the number of male PE teachers. Therefore, it is important to improve female PE instructors' capabilities of effectively integrating technology in the classroom to raise the overall quality of instruction and students' motivation. As the study indicated that male PE teachers are more confident and competent in terms of technology use. Additionally, when it comes to technology use, male PE teachers are more likely to employ PE special computer/mobile technologies than their female counterparts. Thus, the confidence and competence of female PE teachers should be increased by encouraging them to make greater use of PE special computer/mobile technologies such as fitness assessment software (e.g. Sports Tracker, Heiaheia), nutrition planning/analysis software (e.g. MyFitnessPal), and active video games (e.g. Just Dance, Pokémon Go, Jungle Race.) in their teaching.

There are several limitations in this study. Firstly, the sample of this study has 221 participants, which consisted of 140 elementary school teachers and 81 PE teachers. In Finland, the education system is a bit different from other countries, primary teachers also teach sports in PE lessons. To get more participants, this study also investigates primary teachers' attitudes toward technology. Although this study's main research subject is professional PE teachers, it is a challenge to reach more PE teachers from middle schools and high schools to complete this survey since each school normally only has two or three PE teachers. Therefore, future studies should request assistance from the government and schools to increase the number of PE teachers who can serve as research subjects. Secondly, although this research used quantitative methods for analyzing data, it might influence objectivity in measurement. Thus, qualitative methods, for example, interviews and observation could be considered to use in future studies to get more supportive data and information. Also, advanced statistical methods such as multilevel modeling can be used to further explore the relationships between the obstacles and technology use.

This study also contributes to figuring out the barriers especially the administrative support and colleague support that PE teachers encounter when they integrate different educational technology tools into their teaching so that government, administrators, and leaders realized the benefits of the technology and take action to integrate the technology in the schools more effectively.

Future research also can compare the differences between PE instructors in primary school and secondary schools to identify their attitudes toward the technology use. As mentioned above, interviews and observation should be considered in exploring teachers' attitude towards

technology use. Further, this study suggests that special concepts for codes or themes should be developed, especially for the PE subject to deeply explore the teachers' attitude towards technology use and the factors to contribute to integrating the technology. Although Gibbone et al. (2010) have developed some concepts for the codes (such as perceptions related to students, lack of training in technology, budget, and lack of equipment and value in using technology in physical education) in terms of PE subjects, further empirical evidence is necessary.

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Appendix 1

The questionnaire has been translated from English to Finnish. The Finnish questionnaire can be seen in the appendices. English questionnaire adapted from ‘Technology integration in secondary physical education: teachers' attitude and practice’ by Gibbone, A., (2009).

Opettajien käsitykset ja asenteet teknologian hyödyntämisestä liikunnan opetuksessa

Pyydän sinua osallistumaan pro gradu-tutkimukseeni, joka käsittelee opettajien käsityksiä ja asenteita teknologian hyödyntämisestä liikunnan opetuksessa Suomessa. Tutkimukseni tavoitteena on lisätä tietoa ja ymmärrystä teknologian mahdollisuuksista ja haasteista tukea liikunnan opetusta. Kysely sisältää pääasiassa monivalintakysymyksiä, ja kyselyyn vastaamiseen kuluu aikaa noin 15 minuuttia. Vastattuasi kaikkiin kysymyksiin paina kyselyn lopussa olevaa Lähetä-painiketta. Kaikki vastaukset käsitellään luottamuksellisesti ilman tunnistetietoja, kuten nimeäsi ja sähköpostiosoitettasi. Tutkimuksen suorittaa Yumin Raitamaa (yumin@raitamaa.com), joka opiskelee Oulun yliopistossa kansainvälisessä Learning, Education and Technology -maisteriohjelmassa. Tutkimuksen pääohjaajana yliopiston opettaja, Ismail Celik (Ismail.Celik@oulu.fi)

☐

1. *

Olen lukenut ja ymmärtänyt ylläolevan tekstin, ja annan luvan vastausteni tutkimuskäyttöön.

---

2. Täytä seuraavat tiedot: *

	Nainen	Mies
Sukupuoli	○	○

○

3. Vastaajan ikä *

- ○ 20-34
- ○ 34-44
- ○ 45-54
- 55-64
- yli 64

4.

Tämä osa käsittelee tunteitasi teknologiaa kohtaan. Napsauta YHTÄ YMPYRÄÄ jokaiselle toteamukselle.
*

	Vahvasti samaa mieltä	Samaa mieltä	En osa sanoa	Eri mieltä	Täysin eri mieltä
Teknologia voi nostaa liikunnan opetuksen laatua.	○	○	○	○	○
Teknologian käyttö opetuksessa on minulle mielekästä.	○	○	○	○	○
Teknologia kannustaa oppilaita osallistumaan liikuntatunneilla.	○	○	○	○	○
Haluaisin oppia ja käyttää teknologiaa enemmän.	○	○	○	○	○
Minulta odotetaan teknologian osaamista.	○	○	○	○	○
Teknologia vie aikaa tärkeämmiltä asioilta.	○	○	○	○	○
Oppilaitoksessani suurin osa opettajista käyttää teknologiaa opetuksen tukena.	○	○	○	○	○
Tunnen monia liikunnan opettajia, jotka käyttävät teknologiaa opetuksessa.	○	○	○	○	○
Käytän opetuksessani monia eri menetelmiä.	○	○	○	○	○
Pyydän oppilailta palautetta opetuksestani.	○	○	○	○	○
Teknologia ei mukaudu helposti oppilaiden erilaisiin oppimistyyleihin.	○	○	○	○	○
Olen varma taidostani käyttää teknologiaa opetuksen tukena.	○	○	○	○	○
Teknologian käyttö itsenäisesti on minulle yleensä hankalaa.	○	○	○	○	○
Teknologian käyttö on auttanut minua löytämään uusia opetustapoja.	○	○	○	○	○
Haluan osallistua päättämään mitä teknologioita liikunnan opetuksessa käytetään.	○	○	○	○	○

5. Napsauta YHTÄ YMPYRÄÄ jokaiselle toteamukselle. *

	Vahvasti	Samaa	En osa	Eri	Täysin eri

	samaa mieltä	mieltä	sanoa	mieltä	mieltä
Käytän mielelläni teknologiaa liikunnan opetuksessa.	○	○	○	○	○
Teknologian käyttö liikunnan opetuksessa on vaikeaa.	○	○	○	○	○
Minulla on käytössäni tarpeeksi teknologioita luokkani kokoon nähden.	○	○	○	○	○
Monet esteet rajoittavat teknologian käyttöä liikunnan opetuksessani.	○	○	○	○	○
Suurempi määrä käytettävissä olevaa teknologiaa lisäisi sen käyttöä opetuksessani.	○	○	○	○	○
Oppilaitokseni IT-henkilöstö on helposti tavoitettavissa.	○	○	○	○	○
Teknologia vaatii liikaa aikaa tai aiheuttaa vaivaa opetuksen suunnittelussa.	○	○	○	○	○
Teknologian ongelmat ja niiden ratkaiseminen saavat minut hermostuneeksi.	○	○	○	○	○
Hallinto kuuntelee ehdotuksiani henkilöstön kehittämisestä.	○	○	○	○	○
Kun opin jotain uutta teknologiasta, yritän soveltaa sitä käytäntöön.	○	○	○	○	○
Teknologiakoulutus on ollut positiivinen kokemus minulle.	○	○	○	○	○
Olisin valmis sisällyttämään teknologiaa suunniteltaessa uutta opetussuunnitelmaa.	○	○	○	○	○
Teknologia parantaa opetusmateriaalieni laatua.	○	○	○	○	○
Teknologian käyttö ei säästä aikaani.	○	○	○	○	○
Yritän soveltaa monenlaista teknologiaa opetuksessani.	○	○	○	○	○
Tietokoneen käyttöni on lisääntynyt viimeisen 3 vuoden aikana.	○	○	○	○	○
Internetin käyttöni on lisääntynyt viimeisen 3 vuoden aikana.	○	○	○	○	○

6. Seuraava lista sisältää erilaisia teknologioita, laitteita ja sovelluksia. Valitse sopivin vaihtoehto, joka vastaa tietojasi, taitojasi ja/tai osaamistasi.

1 En tunne sovellusta/välinettä.
2 Tunnen sovelluksen/välineen, mutta en ole käyttänyt sitä.
3 Olen kokeillut tätä sovellusta/välinettä muutaman kerran.
4 Tunnen hyvin tämän sovelluksen/välineen ja käytän sitä säännöllisesti opetuksessani.
5 Tunnen tämän sovelluksen erittäin hyvin ja käytän sitä usein ja monipuolisesti omassa opetuksessani.
*

	1	2	3	4	5
Tietokoneella luodut testit/kotitehtävät	○	○	○	○	○
Askelmittari	○	○	○	○	○
Liikunnan opettamiseen keskittyvät sovellukset (esim. Polar GoFit, Nike Training, Sworkit)	○	○	○	○	○
Internetsivun suunnittelu	○	○	○	○	○
Internetin hakukoneet (Google, Bing, jne.)	○	○	○	○	○
Sähköposti	○	○	○	○	○
Sähköpostin liitetiedostot (kuva tai dokumentti)	○	○	○	○	○
Projektori/videotykki	○	○	○	○	○
Diaesitykset tietokoneella (esim. PowerPoint)	○	○	○	○	○
Tietokoneella luodut esitteet tai lehtiset (teksti/grafiikka)	○	○	○	○	○
Pikaviestit tai keskusteluryhmät (esim. FB messenger, FB ryhmät, WhatsApp jne.)	○	○	○	○	○
Postituslistat tai keskustelupalstat	○	○	○	○	○
Podcastit	○	○	○	○	○

7. Valitse sopivin vaihtoehto, jotka vastaavat tietojasi, taitojasi ja/tai osaamistasi.
1 En tunne sovellusta/välinettä.
2 Tunnen sovelluksen/välineen, mutta en ole käyttänyt sitä.
3 Olen kokeillut tätä sovellusta/välinettä muutaman kerran.
4 Tunnen hyvin tämän sovelluksen/välineen ja käytän sitä säännöllisesti opetuksessani.
5 Tunnen tämän sovelluksen erittäin hyvin ja käytän sitä usein ja monipuolisesti omassa opetuksessani. *

	1	2	3	4	5
Tekstinkäsittely (Word, WordPerfect)	○	○	○	○	○
Tehtävien ja/tai kokeiden arvostelu tietokoneella	○	○	○	○	○
Opetuksen hallintasovellukset (esim. SportyPlanner)	○	○	○	○	○
Älytaulu	○	○	○	○	○
Taulukkolaskentaohjelmat (Excel)	○	○	○	○	○
Sykemittarit	○	○	○	○	○
Aktiivisuusmittarit	○	○	○	○	○
Liikunnan seurantasovellukset (esim. Sports Tracker, Heiaheia)	○	○	○	○	○
Ravitsemuksen suunnittelu/analysointi sovellukset (esim. MyFitnessPal)	○	○	○	○	○
Kehonrasvamittari	○	○	○	○	○
Sähköiset fitness-laitteet (juoksumatot yms.)	○	○	○	○	○
Aktiiviset videopelit (esim. Just Dance, Pokémon Go, Jungle Race)	○	○	○	○	○
Digitaalinen piirtäminen tai graafinen editointi (esim. Publisher, Photoshop)	○	○	○	○	○

8. Valitse sopivin vaihtoehto, jotka vastaavat tietojasi, taitojasi ja/tai osaamistasi

1 En tunne sovellusta/välinettä.
2 Tunnen sovelluksen/välineen, mutta en ole käyttänyt sitä.
3 Olen kokeillut tätä sovellusta/välinettä muutaman kerran.
4 Tunnen hyvin tämän sovelluksen/välineen ja käytän sitä säännöllisesti opetuksessani.
5 Tunnen tämän sovelluksen erittäin hyvin ja käytän sitä usein ja monipuolisesti omassa opetuksessani. *

	1	2	3	4	5
Internet videot (esim. YouTube)	○	○	○	○	○
Digikamera/video (esim. älypuhelimen kamera)	○	○	○	○	○
Opetus CD:t tai DVD:t	○	○	○	○	○
Tieteelliset artikkelit verkossa	○	○	○	○	○
Langaton mikrofoni	○	○	○	○	○
Oppilaitoksen internet-sivut	○	○	○	○	○
Wiki- ja/tai Blogi-sivut	○	○	○	○	○
Verkkomateriaalit liikunnanopettajille (esim. Sporttipankki)	○	○	○	○	○
Oppilaiden interaktiivisuuteen liittyvät sovellukset (esim. Kahoot, padlet, Plickers)	○	○	○	○	○
Ryhmäjako -sovellukset (esim. Team Shake, Team Maker)	○	○	○	○	○
Ohjelmoitavat treenikellot (Interval timer, seconds, tabata jne.)	○	○	○	○	○
Actiontrack -sovellus	○	○	○	○	○

9. Lue alla olevat kuvaukset. Valitse niin monta valintaruutua, jotka kuvaavat tämänhetkistä tilannettasi. *

☐ Minulla ei ole paljon kokemusta teknologian käytöstä liikunnan opetuksessa, enkä aio perehtyä aiheeseen lisää.

- [ ] Olen tietoinen teknologian käytöstä liikunnan opetuksessa, mutta en käytä sitä itse, jopa vältän sen käyttöä.
- [ ] Etsin tietoa ja/tai opiskelen teknologian käyttöä liikunnan opetuksessa. Olen turhautunut tai minulta puuttuu asiantuntemusta tästä aiheesta.
- [ ] Käytän teknologiaa sujuvasti, mutta en aktiivisesti yritä käyttää sitä opetuksessa.
- [ ] Tiedän missä teknologian käytöstä on hyötyä. Valmistaudun käyttämään teknologiaa liikunnan opetuksessa.
- [ ] Keskityn teknologian käyttöön lyhyillä aikaväleillä. Pystyn käyttämään teknologiaa joihinkin asioihin oppitunneilla.
- [ ] Käytän teknologiaa vaihtelevasti liikunnan opetuksessa, tietyillä oppitunneilla tai niihin liittyvissä toimissa, yhdessä muiden opettajien kanssa.
- [ ] Käytän teknologiaa vaihtelevasti liikuntaesteisten ohjauksessa ja yritän parantaa teknologian käyttöä opiskelijoiden oppimisessa.
- [ ] Seuraan uusia tutkimuksia ja/tai tavoitteita, ja hyödynnän teknologiaa kaikkialla opetussuunnitelmassani.

10. Kuinka kauan olet toiminut liikunnan opetuksessa? *

11. Arvioi oppilaitoksesi oppilaiden kokonaismäärä: *

12. Arvioi oppilaitoksesi liikuntaryhmien keskimääräinen koko: *

13. Montako liikuntatuntia toteutetaan samanaikaisesti? *

14.
Keskimäärin monenako päivänä viikossa oppilailla on liikuntaa?
*

15.
Keskimäärin montako minuuttia oppilailla on liikuntaa viikossa?
*

16. Oppilaitoksen sijainti (lääni): *

17. Mikä oli kandidaatin tutkintosi pääaine? *

18. Mikä oli maisterin tutkintosi pääaine? *

19.
Mikä oli tohtorin tutkintosi pääaine?
*

20. Millä asteella/asteilla nykyisin opetat liikuntaa?(valitse kaikki sopivat) *

- [ ] Alaaste
- [ ] Yläaste
- [ ] Lukio

21. Valitse teknologian käyttöäsi rajoittavat haasteet (valitse kaikki sopivat) *

- [ ] Budjetti
- [ ] Luokan koko
- [ ] Hallinnon tuki
- [ ] Internetin saatavuus
- [ ] Koulutuksen puute
- [ ] Kollegoiden tuki
- [ ] Muu

22. Mikä haaste on sinulle henkilökohtaisesti vaikein? *

- ◯ Budjetti
- ◯ Luokan koko
- ◯ Hallinnon tuki
- ◯ Internetin saatavuus
- ◯ Koulutuksen puute
- ◯ Kollegoiden tuki
- ◯ Muu

23. Käyttäisitkö enemmän teknologiaa liikunnan opetuksessa, jos sen käyttöön ei vaikuttaisi mikään haaste tai rajoite? *

- ◯ Kyllä
- ◯ En

24. Pohdi kulunutta vuotta ja vastaa seuraaviin väittämiin: *

	Päivittäin	Viikoittain	Kuukausittain	Silloin tällöin	En koskaan
Käytän tietokonetta henkilökohtaisiin asioihin.	○	○	○	○	○
Käytän tietokonetta työssäni.	○	○	○	○	○
Käytän tietokonetta oppituntien valmisteluun.	○	○	○	○	○
Käytän tietokonetta apuna liikunnan opetuksessa.	○	○	○	○	○
Käytän sähköpostia	○	○	○	○	○
Käytän Internetiä.	○	○	○	○	○
Käytän tietokonetta kotona.	○	○	○	○	○
Käytän tietokonetta töissä	○	○	○	○	○
Käytän teknologiaa liikunnan opetuksessa.	○	○	○	○	○
Arvostelen, valitsen, tai ostan teknologiatuotteita.	○	○	○	○	○
Olen osallisena teknologiaan liittyviä ongelmia käsittelevässä komiteassa.	○	○	○	○	○
Keskustelen Internetistä tai teknologiasta muiden opettajien kanssa.	○	○	○	○	○
Autan muita opettajia tietokoneen tai teknologian käytössä	○	○	○	○	○
Käytän teknologiaa päivittäisiin valmisteluihin tai rutiinitehtäviin.	○	○	○	○	○
Annan kotitehtäviä, jotka vaativat teknologian käyttöä	○	○	○	○	○
Haen opetusmateriaalia Internetistä.	○	○	○	○	○

25. Kuinka moniin teknologiaan liittyviin työpajoihin olet osallistunut viimeisen vuoden aikana? *

26. Kuinka monta teknologiaan liittyvää esitelmää olet pitänyt viimeisen vuoden aikana? *

27. Kuinka monta tietokonetta sinulla on käytettävissäsi oppilaitoksessasi? *

28. Kuinka monta vuotta olet käyttänyt oppilaitoksen ja/tai työpaikan tarjoamaa sähköpostia? *

29. Kuinka monta vuotta oppilaitoksesi on tarjonnut sinulle tietokoneen työtäsi varten? *

30. Onko kotonasi Internet-yhteys? *

- ◯ Kyllä
- ◯ Ei

31. Onko toimistossasi Internet-yhteys? *

- ◯ Kyllä
- ◯ Ei

32. Onko oppilaitoksesi tietokonetiloissa Internet-yhteys? *

- ◯ Kyllä
- ◯ Ei

33. Onko oppilaitoksellasi Internet-sivu liikunnan opetukselle? *

- ◯ Kyllä
- ◯ Ei

34. Jos vastasit kyllä, valitse kaikki tavat joilla osallistut sivun kehitykseen (Valitse kaikki sopivat) *

- ☐ Ilmoitan ideoista oppilaitoksen IT-henkilöstölle
- ☐ Suunnittelen sivustoa ammattilaisen kanssa.
- ☐ Suunnittelen sivuston osia itse.
- ☐ Suunnittelen sivuston osia jonkun muun kanssa (opettajat, ystävät, yms.)
- ☐ En osallistu internet-sivun kehitykseen.

35. Missä olet saanut koulutusta teknologian käytöstä (Valitse kaikki sopivat)? *

- ☐ Minulla ei ole virallista koulutusta
- ☐ Itseopiskelu
- ☐ Yliopistokurssi
- ☐ Työkaverit/vertaiset
- ☐ Muut työpaikan ulkopuoliset koulutukset
- ☐ Työpaikan koulutukset
- ☐ Muu

36.

Valitse kaikki saamasi koulutustyypit (Valitse kaikki sopivat)
*

- [ ] Tietokoneen perustoiminnot (Internet, sähköposti, yms.)
- [ ] Yleisimmät tietokoneohjelmat (Word, Exel, yms.)
- [ ] Tietokoneen erikoisohjelmat(erikoissovellukset, web-sivujen luonti, yms.)
- [ ] Tietokoneiden käyttö opetuksessa.

37. Valitse saamasi koulutuksen määrä *

- ◯ Yksi päivä tai vähemmän
- ◯ Useita päiviä / puolikkaita päiviä vuoden aikana
- ◯ Useita päiviä / puolikkaita päiviä monen vuoden aikana
- ◯ Yhden lukukauden mittaisen kurssin
- ◯ Useita lukukauden mittaisia kursseja

38. Alla olevaan tilaan voit jakaa ajatuksia, mielipiteitä, tai kokemuksia teknologian käytöstä liikunnan opetuksessa. *