AN OVERVIEW OF THE OPPORTUNITIES OFFERED BY THE ADVANCEMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY IN THE FIELD OF PHYSICAL EDUCATION AND SPORTS

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ABSTRACT. Introduction. With the outbreak of the COVID-19 pandemic, caused by the novel coronavirus, major challenges have arisen in terms of the development of the teaching process and sports training. For some of them, the solution was offered by the already existing hardware and software technologies, and this created new educational contexts, as well as opportunities for adaptation and evolution of the teaching and training process. **Objectives.** Identify in the literature some principles, guidelines, and recommendations regarding the implementation of technology in the educational and training process. **Methods**. In this paper, the method of studying the literature was used, using information published in international databases. Results. The specialized literature offers many studies on the subject of education assisted by information and communication technology tools, being available examples of success in the specialized practice. **Conclusions.** The challenges and objectives of current education must be considered in the incorporation of technology into education before deciding how information and communication technology tools can be used to achieve them. The educational context has adapted to the current times, teachers become guides and designers of learning situations where technology is a tool that must be used masterfully by them.

Keywords: physical education, sports, information technology.

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REZUMAT. *O privire de ansamblu asupra oportunităţilor oferite de avansul tehnologiei informaţiei şi comunicaţiilor în domeniul educaţiei fizice şi sportului.* **Introducere.** Odată cu izbucnirea pandemiei de COVID-19, cauzată de noul coronavirus, au apărut provocări majore în privinţa desfăşurării procesului didactic şi a antrenamentelor sportive. Pentru o parte dintre acestea, soluţia a fost oferită de tehnologiile hardware şi software existente deja, iar acest lucru a creat noi contexte educaţionale, precum şi oportunităţi de adaptare şi evoluţie a procesului didactic şi de antrenament. **Obiective.** Identificarea în literatura de specialitate a unor principii, direcţii şi recomandări în privinţa implementării tehnologiei în procesul educaţional şi de antrenament. **Metode**. În realizarea acestei lucrări s-a folosit metoda studiului literaturii de specialitate, folosind informaţii publicate în bazele de date internaţionale. Rezultate. Literatura de specialitate oferă o cantitate mare de studii pe tema educaţiei asistate de instrumentele tehnologiei informaţiei şi a comunicaţiilor, fiind disponibile exemple de succes din practica de specialitate. **Concluzii.** În încorporarea tehnologiei în educaţie trebuie avute în vedere provocările şi obiectivele educaţiei curente înainte de a decide cum pot fi utilizate instrumentele din tehnologia informaţiei şi a comunicării la atingerea acestora. Contextul educaţional s-a adaptat vremurilor actuale, profesorii devin ghizi şi designeri ai situaţiilor de învăţare unde tehnologia este o unealtă care trebuie folosită cu măiestrie de către aceştia.

Cuvinte cheie: educaţie fizică, sport, tehnologia informaţiei.

Introduction

In this paper, we will analyze the new educational and sports training opportunities offered by technologies in the field of physical education that promote not only health but also education.

Technologies, especially since the 2000s, have enriched school education, expanded content, tools, methodologies, and changed the relationship between specific knowledge, teachers, coaches, and students or athletes. Rapid developments in electronic technology have brought important changes to the world's education systems.

Kretschmann (2015) says that the use of technology is an important effect of mediation between discipline and student, helping to change learning patterns, develop intrinsic motivation and metacognition. The most important technologies used in schools (video recordings and personal computers) have led to a reset of knowledge and new areas of intervention have emerged in each area in relation to key disciplinary topics.

Objectives

This article sought to identify in the literature some information about the principles, directions and recommendations made by other authors regarding the implementation of technology in the process of education and sports training.

Materials and methods

In this paper, the method of studying the specialized literature was used, using information published in the Science Direct, ProQuest, EBSCO and Google Scholar international databases, starting from keywords such as: physical education, sports, information technology and their derivatives.

Results

Following the analysis of the identified articles, we found out that there are a multitude of software applications in the field of health and education. They are available and can be used to enrich and improve curricula in most schools. Numerous technology applications for promoting physical activity and fitness are available and easily accessible.

Today, the application of various technologies by students and teachers requires new skills. Students must demonstrate motor skills and use technology primarily through a process of self-learning. It is essential to learn how to manage the organization of activities together with the use of different equipment.

Teachers, on the other hand, "need to become more aware of teaching styles and strategies and should always support the use of technological applications in physical education" (Herring, Edginton, Geadelmann, & Chin, 2012).

In their study Gibbone, Rukavina, & Silverman (2010) examine attitudes, physical education teacher training, technology integration, and the relationship between attitudes and practice.

Their results show that teachers have positive attitudes, but still show limited use of technology.

The limitations that affect the use of technology are the school budget, the large number of classes / groups and the process of ongoing teacher training. Physical educators are willing to apply teaching technology only if adequate training and financial resources are provided.

The National Association for Sport and Physical Education (NASPE) (2009), an entity in the United States, has published guidelines on the appropriate use of teaching technologies in physical education:

"Guideline 1: Educational technologies in the field of physical education aim to increase teaching efficiency;

Guideline 2: Educational technologies in the field of physical education aim to supplement not to substitute, teaching efficiency;

Guideline 3: Educational technologies in physical education should provide learning opportunities
and education for all students;

Guideline 4: Educational technologies in physical education should be an effective tool for storing student data on its curricular objectives."

NASPE studies (2009) also state that it is important for teachers to learn and understand technological tools before using them in gyms so that their students can use these tools effectively and not use equipment and tools. it must interfere with the achievement of the lesson objectives.

Subsequently, Sanders & Witherspoon (2012) summarized the important processes that must be performed when using technology in physical education. The authors (Sanders & Witherspoon, 2012) argue the following:

"1) technology can be a challenge;

2) continuing education is needed for physical educators to develop their skills in the use of technology;

3) availability of a budget for the purchase of technological tools in schools with priority in physical education;

4) there must be defined standards for safe technological use in all areas of sports and physical education for students of all ages;

5) periodic updating of the software must be included in the budget;

6) physical education programs for teachers should include technological applications;

7) technologies should be used in the assessment process and for the exchange of information with teachers, principals, students and parents. "

Other studies (Castelli, Cenetio, Beighle, Carson, & Nicksic, 2014, 66) also warn that technology is innovative in the way students learn and teachers teach, and physical education and health promotion programs are developed for to provide participants with better opportunities instead of the traditional way of learning in gyms.

Regarding the relationship between physical education and technology, it is possible to identify different directions and complementary studies: epistemological, psycho-pedagogical, and socio-cultural.

The epistemological perspective is essentially a didactic one based on scientific evidence.

Regarding physical education, several areas of interdependence between education and technology can be identified, as follows:

a. technology in and for physical education (i.e., contribution to a learning of motor skills in school; integration of new methods for assessing motor development, data processing and storage, etc.);

b. physical education and technology (i.e., the relationship between physical activity and the use of tools and equipment, for example, heart rate monitors, accelerometers, stereo systems, video cameras, digital cameras, projectors, i-pads or online education). online, including various teachings such as physiology, neuroscience, history, science, through interactive videos, web pages and learning effects, etc.);

c. technologies for promoting health through physical activity (use of pedometers and accelerometers to assess levels of physical activity, use of GPS to assess and customize, use of web platforms to record performance and parameters and comparison of performance benchmarks, preparation of training etc.).

Physical education is becoming richer than in the past and every field (expressive activities, games, sports, outdoor education, motor and interdisciplinary learning) receives a significant contribution and is revised and expanded. By using different tools, physical education establishes closer links between scientific fields and stronger links between different fields of knowledge.

From a psycho-pedagogical perspective, the use of technology in physical education promotes an efficient process of learning motor skills, allowing students to evaluate the experience gained by comparing it in different periods of time. Teaching motor skills (skills, knowledge, motivations, attitudes and relationships), through different teaching styles and strategies (Schmidt A., 2000); (Mosston & Ashworth, 2002) with technological tools, not only broadens and specifies the didactic-educational directions, but introduces new ways to learn skills and knowledge in different contexts. In this direction, technologies promote the learning and recapitulation of motor skills, psychological factors related to practice, perception of competence, mutual evaluation, joy, mental processes and metacognitive processes (Fiorentino, 2005; Dillon, 2008).

From a socio-cultural perspective, technologies support curricula in schools, produce reticular knowledge and expand or connect learning environments. Computers and video cameras allow you to share data and experiences from physical and sports activities (simultaneously and / or at a different time) among users and for the development of interpersonal relationships. The student can participate in physical activities and online fitness programs, analyze and

share video analysis data related to physical education classes and training sessions, compare experiences and activities in different geographical locations. The effects on teaching and learning have been extended. With the help of smartphones in physical education and sports, they can compose and send texts, data, photos and videos, participate in social media on health promotion issues or sports, receive real-time information on the development of demonstrations, events, and to recognize the availability of facilities and the use of equipment for physical activities.

Discussions

The inclusion of information and communication technology (ICT) in physical education to encourage exercise is still in its infancy. However, there are already many examples of how the use of ICT in physical education can stimulate physical activity among students. In fact, when social networks are used correctly, they become a powerful tool for promoting a healthy lifestyle among adolescents (Monguillot, González, & Guitert, 2015).

For example, the project #tuitactiu (Nieto Tó, 2012) uses Twitter in physical education to spread the practice of physical exercise among students. The #quesepegue project (Herrero Serrano, 2012) uses Twitter to cheer up downtime with healthy physical activity. Finally, the use of m-learning or mobile-learning (Monguillot M., González, Guitert, & Zurita, 2014) paves the way for new forms of learning and teaching that are useful and functional and facilitate interaction, collaboration, knowledge generation. and combining formal and informal learning environments. In this way, learning tends to become more personalized and extends beyond the walls of the classroom.

Although teachers have used technology for many years (Wozney, Venkatesh, & Abrami, 2006), physical education teachers have now also integrated the use of different electronic platforms in their instruction (Gibbone, Rukavina, & Silverman, 2010; Riley & Stern, 2004). Technology allows teachers to have a much wider range of broadcasting their message (Hastie, Farias, & Gutiérrez, 2013). It can play a central role in supporting learning, especially in physical education (Fiorentino, 2005). The experiences with technology that students have can increase their understanding and can cause the pleasure of practicing physical activities (Kooiman & Sheehan, 2014).

Education is moving towards a technology-based training and learning forum. Technology brings with it new ways for teachers and students to communicate remotely. Teaching and learning methods can be transformed by technology. Using technology effectively for training planning (Riley & Stern, 2004) and implementing training can enable culturally relevant training.

Teachers can use current technology to create the curriculum that can use it (Summers, Waigandt, & Whittaker, 2005). The scarcity (rarity) of extensive research into the efficiency of technology is due to the ever-changing and rapid evolution of electronic platforms. However, technology has provided various learning outcomes in motor skills (Fery & Pontserre, 2001) and curriculum (Goddard, 2002).

The variety of electronic platforms available to physical education teachers is constantly growing and changing (Williamson, 2015). New and emerging technologies promise efficiency and different ways of teaching and learning (Palao, Hastie, Cruz, & Ortega, 2015). By infusing technology into the physical education curriculum, the realization of cultural relevance can be intensified. Increasing the ability of teachers to take and disseminate information about training methods and content used around the world can also help to create more connected lessons for a diverse class.

The literature also suggests that effective technological integration in education requires teachers to apply their knowledge of curricular content, general pedagogy, and technology. This approach, known as " Technological Pedagogical Content Knowledge Framework" (TPACK).

Conclusions

Therefore, in order to incorporate technology into education, we must first consider the challenges and objectives of current education and then decide how information and communication technology tools can be used to achieve them. In the new methods, students take on the role of leader in educational activity, while teachers become guides and designers of learning situations.

In addition, technology must be and remain a tool masterfully used by specialists in our field and not a way to replace them with "soft" skills, which are an asset of the teacher and the coach.

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