

Use of Information and Communication Technology in Physical Education and Sports

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Abstract

A rapid development in the field of technology has led to its integration and use in many areas including teaching and learning of physical education and sports. Today's education is based on e-learning where the educators are provided with an opportunity to improve their teaching and methodology through the use of advanced technology.

Information and communication technologies (ICTs) have the potential to completely change and reform our educational system (Lavin, 2008). ICT, which includes radio, television, and other newer and advanced digital technologies such as computers and the Internet, are now increasingly being implied in every field including the domain of Physical Education. The range of these tools have expanded in this context and the newer generation which has grown up with technology is finding it much easier and affordable to engage in physical activities instead of sitting on a video game for hours.

In the context of Physical Education, the devices such as projection systems, smart boards and wireless transmission (WiFi and Bluetooth) help in enhancing physical education instructions and skills. While in the context of Sports, the tools such as heart rate monitors, pedometers, and computers prove to be highly useful and accurate in keeping track of the level of physical fitness achieved by a sportsperson.

Thus, we can see that the role of technology in the field of Physical Education and Sports has been magnified. This paper aims to provide a glimpse of its far-reaching effects and the place it is to take in the lives of people in near future.

Keywords: Technology, ICT, computers.

Introduction

The modern era is characterized by rapid technological advances in every field of human life and work. It has already become an inseparable part of each discipline of knowledge be it engineering, Medical, Education, Corporate, Industry, Sports or Recreation. The present digital age has seen many changes on account of technology. These changes range from the ways and means in which knowledge is imparted, to the attitudes with which learning takes place, to the extent of

collaboration and information sharing between not only students, but also between educators, managers and administrators. Technology forms an integral part of most people's everyday lives, and young people in our schools are especially wedded to them. If technology had an impact on learning in general education, it is quite obvious that it has its influence in the field of Physical Education as well.

Influenced by the technological, social and cultural changes, today, the domain of Physical Education faces a new dimension dominated by Learning through technology. New developments in the field of technology are continuously affecting the curriculum of Physical Education. Use of computers and other information technologies represents a technical alternative meant to increase the effectiveness of the teaching process. Although physical education and sports are practical activities, they are fully compatible with the application of modern ICT tools and applications.

According to Green (2002), with the rapid developments in technology, ICT has made a significant impact on a number of P.E departments, and has the potential to enhance teaching and learning in P.E. Cummings (2002), further suggests that the pervasion of ICT in education is now impacting on P.E as much as on any other subject.

This paper aims at highlighting the importance of using Computers and other information and communication technologies in physical education and sports. The outcomes of rapid digitalization in the sphere of Physical Education can be understood in the following aspects: result recording, motion examination, educational software, activity designing and planning, biomechanics video analysis, performance comparing and synchronizing, distance and time measurements and activity evaluation. While the overall effect is not yet fully assessable, the presence of technology in so many different aspects of the physical education makes it important to more clearly recognize and appreciate its significant role.

Information And Communication Technology (Ict)

Information and Communications Technology (ICT) are a diverse set of technological tools and resources used for creating, storing, managing and communicating information, and to support teaching and learning and research activities (Vajargah, Jahani & Azadmanesh, 2010). Technology or ICT (information and communication technologies) can be defined as “anything which allows us to get information, to communicate with each other, or to have an effect on the environment using electronic or digital equipment” (Bolstad, 2004, p.vii). ICT also “describes the equipment (hardware) and computer programmes (software) that allows us to access, retrieve, store, organize, share and present information electronically” (Ministry of Education, 2005, p.4). In terms of these descriptors, ICT can mean a broad range of tools that allows teachers, children and families to access and share information in new and innovative ways.

Information and Communication Technology (ICT) includes computers, the Internet, and electronic delivery systems such as radios, televisions, and projectors among others, and is widely used in today's education field. Kent and Facer (2004) indicated that school is an important environment in which students participate in a wide range of computer activities,

while the home serves as a complementary site for regular engagement in a narrower set of computer activities.

Ict In Physical Education And Sports

Nowadays, ICT tools are being universally used in the field of physical education and sports. Physical Education, being a highly practical discipline, requires specialized devices and equipments to measure the real time changes and movements in the body parts. Specialized ICT tools prove to be immensely useful when there is a need to keep track of the developments and changes brought about in the body parts and internal body systems by exertions of physical exercises. Various commercial and shareware programs have been developed and are available to track student athletic performance, grading, fitness; conduct health assessments; monitor research projects and provide simulations of disease among other multitude functions.

ICT is also very important with regards to school administrative work. In fact, data can easily be collected and shared for analytical purposes, e.g. electronic records of performance of athletes. ICT also promotes teaching and learning within the school organization by changing the nature of learning itself. Students are motivated and are able to grasp essential concepts that previously eluded them. By developing their abilities to think in different ways students can select and apply skills, tactics and ideas, to evaluate and increase performance. Moreover, with the infusion of ICT in Physical Education, learning can be enhanced through the collection of resources via the internet.

In addition, with ICT, pupils are able to get access, select and interpret a wide range of information more easily. They are also able to recognize patterns, relationships and behaviors using appropriate technological softwares. Access to images of quality performances can be obtained through video filming. Hence, students are able to review their work and modify it to improve quality. Through ICT tools, reliability, evaluation and accuracy of actions can also be done. ICT further provides a very reliable source of communication among people within the organization. The use of email, fax, facebook or even skype will enable quick and direct communication among Physical Education staffs and even students regarding meetings and many other relevant matters. Therefore, accuracy of information does not depend only on the busy school secretary. ICT can provide a way out from issues of miscommunication or communication gaps.

Through various kinds of ICT tools, pupils can benefit from immediate feedback to improve their observational and analysis skills. As they familiarize with the software, they are also able to point out the relevant points for positive technique. The main advantage, however, remains the general improvement in the performance level of the majority of the pupils' work, as they struggle their way to look impressive especially if their performance will be analyzed on digital video system.

There are many good options available to physical educators in regards to technology. Many of these technologies are easily accessible and are easily incorporated into the curriculum.

Some Technological Tools

Digital Video camera and visual analysis software Digital Video Camera, as the name suggests, captures the movements and actions of the athletes in a real-time environment and helps in avoiding confusions in judgments. It has made it easier to collect and record data about an athlete's performance. In the areas of teaching as well as research, the use of motion analysis system proves useful in enhancing the physical education curriculum. These results can then be imported to carry out interactive multimedia presentations to provide students with a better understanding of the importance of breaking skills into components and the consequences of subtle variation in techniques (Ladda, Keating, Adam, Toscana, 2004).

The visual analysis software permits practitioners and learners to view and re-view captured movements and to analyze them in the light of further improvements. This sophisticated technology helps teachers to keep track of student's progress related to motor skill goals; provides feedback opportunities and assesses students learning.

Using digital video camera to record pupils' performance in sports can be a useful tool to help students improve their skills and techniques. Appended by Motion Analysis Software, this tool becomes highly effective in recording each and every angle of a performer's movement. The speed, direction and angles of movements of athletes are recorded by time frames and it can be viewed in a slow motion making each move crystal clear. The P.E teacher can then use the Digital video camera to analyze the actions more closely. This is done with a view to improve the teaching and learning performances. Digital video clips can be used to draw attention to proper and improper techniques and then the pupils should be given opportunities to evaluate their own techniques and the technique of others.

Pedometers

Pedometers are devices which are used to count steps. Therefore, they are also known as Step Counters. They can be very easily incorporated and used in Physical Education classrooms. One of the major advantages of Pedometers is that they are portable and can be worn on the waist under a belt for the whole day without causing any inconvenience. It can be used as a powerful tool for measuring physical activities. Students can wear a pedometer and receive immediate and continuous feedback regarding their activity level (Beighle, Pangrazi, Vincent, 2001). With these tools at one's discharge, the players, coaches and parents can keep a track of all the activities. Students can get immediate feedback regarding their level of activity. The use of pedometer enables a student to review his/her progress towards defined goals or targets and helps in keeping them motivated throughout the course.

Heart Rate Monitors

Heart Rate Monitor is an apparatus which provides real time data about the changes in the heart rate. It is a convenient device which enables students to make use of advanced technology for keeping a record of the working of their cardiovascular system. With this information, students can set individualized goals so that they can work effectively. Heart Rate Monitors make learning more student centered as they are based completely on students' ability level and their

current level of body fitness. It also provides immediate feedback that can make students work harder (Bian, Partridge, King, Andon, Boyer, 2007). Teachers can make use of this tool and prepare charts for each student's maximum heart rate for keeping track of any increase or decrease in their heart rates.

Simulation and Games

Games are activities which allow students to simultaneously remain healthy and enjoy themselves in the process. They help in constantly maintaining the interest of students in the learning process by providing them opportunities for exciting experiences. Games when associated with technology can bring out a different dimension of pleasure along with the enhancement of technical skills in a person. There are a variety of such games, the opportunities of which can be readily provided to students in PE classes. These include Dance Revolutions, Nintendo Wii Fit, Fx Cycles etc. These games can also be combined to other technologies to enhance the experience (Di Giorgio, 2004). Games can obviously become useful Physical Education tools but they should be incorporated as a supplement to conventional forms of exercises and not as a replacement.

Coach my video

It is an extremely useful tool for providing immediate feedback to a performer. By using this tool a player is able to review his own performance on a screen and judge the same in the light of further improvements. It also allows students to watch the performance of expert athletes paying careful attention to each move and strategy by pausing, rewinding and playing the video in slow motion. The biggest advantage of this device lies in the fact that it can be used to compare the performances of two athletes on a split screen simultaneously, thus providing for greater flexibility in analysis and assessment.

Sprint timer

A valuable application for athletics and running events, Split Timer makes it possible to mark accurately the timing of each competitor crossing the finish line. With its Motion Activated Video Finish feature, this tool can also be used for longer races where the participants arrive at longer intervals. The most attractive property of this application is that along with still images, videos can also be saved for further analysis. Sprint Timer can be applied to almost all forms of racing, e.g. athletics, horse racing, cycling, speed skating, car or motorcycle racing, rowing, and so on. It can be effectively used during single practice, school gym class and small track meets. It is a useful asset for coaches and teachers who wish to time several athletes simultaneously, and to be able to clearly distinguish between competitors.

Edmodo

Edmodo is a social learning network for students and teachers. While its range of application reaches far and wide, it can be a valuable tool for Physical Education students. Edmodo provides a platform for connecting with people working in similar areas of interest for the purpose of sharing ideas and experiences. Also, one can upload quizzes, exam questions, test papers,

educative videos of fields and players and a variety of other useful resources for everyone to engage in. It is very user-friendly and can be effectively used to enhance learning activities.

Conclusion And Recommendation

Thus, we can see the uses of various Information and Communication tools in Physical Education and Sports. The applications dealt above are just a fraction of the countless tools available nowadays which, with appropriate infrastructural and managerial facilities, can be utilized effectively in the field of Physical Education and Sports. However, to be able to work with such advanced ICT applications one must be equipped with the necessary technical knowledge and skills. Dealing with sophisticated appliances require high level of competency and technical understanding. Therefore, proper training to teachers and students in relation to ICT tools must be provided through seminars, workshops, symposiums, trainings and other courses.

As most of the ICT applications require an internet connection, therefore it must be ensured that proper internet facilities are available to the students as well as teachers for good communication between related faculties. This will also enable them to be updated with newer versions of technology and to constantly learn and hone their technical skills.

Some useful digital applications such as Mobile phones, I-pads and cameras should be allowed to be brought in Physical Education classrooms and training courts so that students can capture and record their own and other's activities with a view to learn from them after classes or practice sessions. This will also allow them to assess and judge others' performances enabling them to give genuine feedback to peers.

It is clear from the above discussion that the implications of ICT tools in physical education and sports are varied and many. However the fact that such modern and sophisticated tools and appliances require a great deal of money cannot be overlooked. In a developing country like India, sometimes it becomes very difficult to arrange for highly technical classrooms and devices for courses like Physical Education which go beyond traditional disciplines. This problem needs to be tackled at the governmental level. Specific equipments like digital video camera and visual analysis software should be provided to the Physical Education departments in all schools and colleges. Such equipments are costly. So government organizations and other sponsors must contribute to raise funds to install these equipments. Thus, we can see how valuable ICT tools and applications can be in the teaching and learning of Physical Education and sports activities. These can enhance students' cognitive domain along with their psychomotor skills. With the use of these applications it can be ensured that students do not drop this subject mid-way as they do in other purely academic subjects. Technology is expected to make learning interesting and effective and students are more likely to choose this stream readily as their assessment here, would be made for 'playing' and 'doing exercises' which they find interesting unlike other traditional subjects.

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