

The use of ICT in Sports and Physical Education

The use of ICT in PE makes the science of sport come to life by linking both physical and mental activity. It also helps to create full-fledged students who are able to concentrate better on both practical and theoretical work. Besides, it helps students to develop a better understanding of their own body parts and that of the human body in general. It also raises the profile of P.E within the establishment by making the subject not only interesting, but also attractive and effective. Furthermore, it brings enthusiasm and motivation for both PE teachers and students.

Information and communications technology (ICT) describe the variety of technological tools and resources used to produce, distribute, store and manage information and knowledge. In the modern era, these tools have brought revolutions to training and teaching methodologies of sports and physical education. Rapid development in ICT have introduced innovation and increases the effectiveness of training program. Using these advanced ICT tools, performance level continues to grow and expected level of performance increases to all time high ICT improves accessibility and expand digital environment to the field of sports and physical education. It not only let a user to earn knowledge, it also helps to connect and communicate with the world. It brings changes and reforms to pedagogy of physical education and sports. Therefore, in the current study the researcher intends to discuss about some of the popularly used ICT tools in the field of sports and physical education.

ICT tools for sports and physical education

Now day's coaches and trainers have many available technical options to use as ICT tools. The majority of these tools can be easily accessed or integrated to training program. Here we will discuss about usages of some of the popular ICT tools in modern day sports training and physical education.

1.Field based ICT tools

These are the kind of ICT tools which are used in on ground/field situations. One of the major field-based ICT tools is GPS based tracking devices. Study on GPS based tracking devices itself is a huge chapter. Along with technological advancement precision of this kind of devices has been improving. Now days using these devices data can be easily obtained and analyze for performance improvement. Dedicated sports specific GPS based devices have been developed to improve and monitor the performance of the players. Most of the outdoor activities, like hiking, fishing, paragliding etc. rely on precision navigation. Using these devices, a player can be tracked irrespective of on land or in water or in air. Long distance runners use these devices to navigate their routes. Swimmers use these devices in open water long distance swimming competitions, where there is a high chance of getting distracted from the actual path. In team sports like soccer, rugby, kabaddi, hockey etc. multiple GPS devices are used to track every team member throughout the whole training sessions or even in match situations. In every outdoor racing sport, GPS is a mandatory device to be attached with the player. It helps the officials to keep track of the players as well as for the players, it helps to track their route and progresses.

Wearable sensor-based devices are another kind of field-based ICT tool.

This kind of devices are made up of various types of sensors. Some of them are only specific and confined to a single sensor and some of them are combination of multiple sensors. Different sensors have different purposes and according to that they help to acquire data. These sensor-based devices can be easily attached to human body using a belt or a strip. Pedometers are such sensor-based devices which can count the number of steps you take. It can also detect your running pattern or the distance you have travelled. Heart rate monitors are another such sensor-based device whose purpose is to sense or detect heart rate. Use of video camera is the best method to record performance of the players on the field. The recorded video can be broadcasted live or uploaded later on. The same video can also be used for match and performance analysis.

Recent advanced technology used high-tech video recorder to record any performance and can directly convert them to three-dimensional data using high level software. In top level competitions, the necessity of precision in officiating is of most importance. Various technologies have been recently developed to fulfill this requirement. In cricket hot spot technology is used to gain information and make precise decision. In football goal line technology is used to detect when the ball crosses the goal line. In sports like badminton and lawn tennis, hawk-eye technology is used to make correct decision.

2.Laboratory based ICT tools

Laboratory based ICT tools can't be used in real game or match situations.They have to be set up permanently in laboratory based controlled environment. Most of the sports research tool falls under this category. Pressure plate and force plate are good example of such kind of ICT tools. Wired EMG devices are also considered as laboratory-based ICT devices. Some three-dimensional analysis kits are also immovable and once they are set up inside a laboratory, sports actions have to be performed under its control condition. Such kind of devices which are needed to be set up in laboratory only, are called as laboratory-based ICT tools.

3.Classroom based ICT tools

Classroom based ICT tools for sports training or physical education are similar to the tools used in real classroom set up. Computer/laptop projector is an important tool in this set up. Apart from it, various community based social tool like Google Classroom, Socrative, Khan Academy etc. are also part of classroom-based ICT tools. Various screen sharing tools like Skype,Team Viewer, Display Note etc. can share exactly the same as it displays on one's screen. Multiple users from different locations can view one's screen at the same time and can learn without being present physically.

4.Software and applications

Software is set of instructions which tells the computer what to do once instructed. There are various kind of software and applications available in the market. The usages of software and applications in sports and physical education can further be classified according to their performed task. Most of the biomechanical analysis software are integrated with number of video cameras. Some of this software are manual in nature and some of them are automatic . Three- dimensional biomechanical analysis software are much more complicated compared to the two-dimensional analysis software. Match analysis software are another important component of sports training tool in the recent times. Recorded video can be analyzed in post-match condition or in live situations. Live feedback and report of analysis can be explained to the players even in ongoing match situations. Now days, these match analysis software are very important to achieve desired goal for most of the team games or sports.

5.Multimedia files and documents sharing platforms

It is not easy for a trainer or a teacher to repeat everything for everybody. Neither it is possible for him to deliver his lecture or training physically to every location. Here the multimedia and document sharing platform comes in handy. Multimedia and document sharing platforms let a user to share different kind of files to his audiences. Google drive, Dropbox, Microsoft one drive are some of the popular file sharing platforms.

6.Professional development platform

Most new skills, tools and resources become obsolete by the time they reach to their professional environment. Therefore, professional development platforms are very much essential to keep everybody updated about the new skills, tools and resources.

7.Pedometers

These apparatus also called step counters are mechanical sensors used to count steps and can easily be incorporated in PE classes. They address motivation, assessment, and advocacy. Furthermore, they are

portable and can be worn under the belt and be kept the whole day. Today, it can be said that the pedometer has become a recognized acceptable tool for measuring physical activity. Students can wear a pedometer and receive immediate and continuous feedback regarding their activity level. Using pedometers at school can also demonstrate to parents that students are achieving a certain level of physical activity. By using the pedometers students will be able to see progress towards set goal and consequently will be more motivated in the classes.

8.Heart Rate Monitors

Based completely on the student ability level and current level of fitness, the heart rate monitor makes learning more student centered. It also provides immediate feedback that can make students work harder. As fitness level increases, student feel that their cardiovascular system is working and can set individualized goal to work more effectively. The Heart rate monitor will also provide real time data that will allow students to see how different exercises and activities affect the heart rate. Hence the heart rate monitor is a convenient apparatus that allows students to use up to date technology. Charts of maximum heart rate can be made for each student and track increase or decrease in their heart rate.

9. Digital Video camera and visual analysis software

The use of the motion analysis system will surely enhance many areas of the physical education curriculum both in research and teaching. Using digital video camera has indeed simplified the collection of data. These results can then be imported to carry out interactive multimedia presentation to provide students with a better understanding of the importance of breaking skills into components and the consequences of subtle variation in techniques. The visual analysis software allows students to view captured movement and to analyse them. This particular technology can help teachers to control student's progress towards motor skills goals; provide feedback opportunities and assessing students learning .

Using digital video camera to record pupils' performance in table tennis for example, can be a useful tool to help students improve their techniques. With the addition of motion analysis software, pupils have a professional supportive tool. For instance during a training session, a 'robot – pong', which is a special technological tool that distribute ping pong balls at varying direction and speed, is used to face a student. The P.E teacher can then use the Digital video camera to analyse the actions more closely. This is done with a view to improve the teaching and learning of table tennis. Digital video clips were used weekly to stress on proper and improper techniques and then the pupils were given the opportunity to evaluate their own techniques and the technique of others via the 'déjà vu' resource. In the Mauritian context, some state colleges which are actually working on a pilot project set up by the ministry of education are presenting candidates for the Cambridge O level Examination. Teachers involved in this project will have to make use of video cameras during the practical examination to record students' performance and then send them to Cambridge University. Each college involved in the pilot project have already received a laptop, an overhead projector and its respective screen. Digital video cameras and internet connection facilities will soon be available in these schools.

10.Simulation and Games

Games such as Dance, Dance revolution, Fx cycles and Nintendo Wii Fit provide opportunities for students to be physically active and simultaneously enjoying themselves .These games can also be combined to other technologies to enhance the experience. Concerning the Nintendo Wii Fit, work outs are done on a small balanced board that gamers stand on. The players receive instructions from screen and mimic the stretching and muscle building exercises. The Wii Fit tracking feature shows progress using the system. Therefore, it can be a valuable PE tool. However, teachers should not consider gaming system equivalent to traditional exercises. It should be considered as a supplement and a not a replacement of traditional exercises.