Digital Technologies in the Classroom

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Abstract

Digital revolution across the world has influenced every aspect of our lives. Like any other field, technology has brought radical changes in the lives of teachers and students. Nowadays, it is impossible for a teacher to stay away from the impact of digitalization of education. In fact, a teacher can empower himself and his students with the use of digital technologies in the classroom. In this digital climate, technology has taken the main seat, and students have access to the best sources in the world on a single click. Digital technologies like projectors and cameras are commonly used along with virtual screen, smart devices, and digital pens in twenty first-century classrooms. This module has been designed to attain the following learning outcomes.

Keywords: technology, devices, applications, methods, systems and digital platform

1. Meaning of Digital Technology

Digital technology includes all those devices, applications, methods and systems which are based on digital format. In broader terms, it comprises of all those electronic devices and systems which utilizes numeric code or digital information for their functioning. It is used in mobile phones, computers, social media, online games, industries, and online shopping, etc. Like any other field, the use of digital technology in teaching is becoming very popular across world. Some countries like Japan are leading us in the area of digitalization in classrooms and have tested the impact of the complete digitalization of classrooms through many research studies. A number of studies have reported positive influence of classroom digitalization on various aspects of students' development.

In contrast to the past, now students and teachers want to have a digital platform for giving pre-work, assignments, providing online assistance and answering students' queries. They do not want to restrict knowledge within the physical boundaries of a classroom, school, college. or university. Traditional classrooms provide very few opportunities for personalized and independent learning. However, digital classrooms have shown tremendous scope and opportunity for facilitating learning. The digital transformation of education is focused on improvement and enhancement of quality of education. These technologies can also be used to combine both classrooms and online learning. In addition, virtual reality and augmented reality has the potential to revolutionize the area of education by providing immersive experiences.

2. Digital Technologies in the Classroom

The usage and presence of technology can be felt everywhere as, it is entwined in almost every part of our lives. It has affected the way we live, work, think and most importantly, it has changed the entire process of learning. Therefore, deployment of digital technology in classrooms cannot be ignored. Technology when well-integrated in the classroom help the students in connecting effectively with the whole process of learning. Today's generation is a native of digital era and technology is completely woven in their lives and they feel comfortable in using technology and when technology is integrated in classrooms then it can help in keeping students engaged. Integration of technology has the power to transform different aspects of teaching (from lesson planning to evaluation). So, it seems relevant to align today's classrooms with the way that students want to learn. Integration of technology will provide a new learning platform for the students and open new opportunities to learn. In recent years, various research studies conducted all over the world have confirmed the role of digital technology in bringing active learning, knowledge exploration, improving creativity and critical thinking. The interaction between teacher and student has increased through remote communication.

The use of digital technology is not limited to one area of education rather; it has multi-fold potential for both teachers and students. Technology, if handled carefully, can facilitate the process of teaching and learning. There are various ways through which a teacher can integrate digital technology in the classroom, some of them are listed below:

(1) Bring Your Own Device (BYOD): It is also called as "Bring your own Technology". Based on the utilization of the user's own tablet, smart phone, and laptop for their learning activity, BYOD is a new concept which is popularly used in industries and organizations. The present generation is growing up with technology and want the same devices both at school and at home. Nowadays everyone is having their own smart phone and laptop, and this practice is gaining popularity in the field of teaching and learning. The students are required to bring their own devices in the classroom. In fact, this style of doing things can be effectively used in innovative teaching and thus engages them the students with their own device. This will reduce the cost of the institution as well as greater range
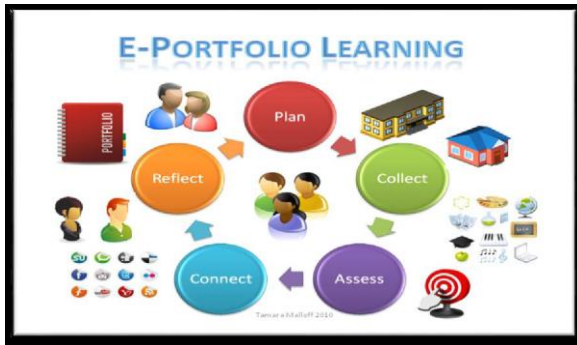
of technologies can be available for the learners.

Source: https://pxhere.com/en/photo/979775

Source: http://www.systemid.com/learn/consumerization-and-byod-changing-businesses/

(2) E-portfolio: E-portfolio is an electronic catalogue of someone's work and achievements which is available online. It is place where students can keep a record of all their work, goals and achievements. E-portfolio enables the usage of wide range of technology/media like video, images, text etc. which allows the learner to understand the process of learning and its outcomes. It can be carried by the learner to enhance their learning throughout life. It is like creating a personal website which is used to record, reflect and evaluate the process of learning at any time.

Source:
https://www.flickr.com/photos/kootenayleaders
hip/5299247644

Thus, it presents a large variety of materials in the form of multimedia files. E-portfolios can help a student in showcasing their best piece of work and would reflect on their learning. The teacher can use e-portfolio for tracking the progress of students. It can also be used for engaging students, enhancing learning, evaluating and providing feedback.

(3) Flipped classroom: In traditional classrooms, content is delivered during classroom teaching and homework is given for more practice. However, in the flip classroom, teaching learning material is introduced often online so that they can access the content any time before the class starts and can write down their questions/problems which can be asked during the classroom.

Source: https://commons.wikimedia.org/wiki/File:The_Flipped_Classroom.jpg

In flipped classroom model, the teacher has to curate resources and manage the classroom. A teacher must take technology training before using flipped classroom model in the class. The teacher may need some tools like YouTube (for video content), social media (for content dissemination), devices (Smartphone or laptops for access), web links and websites etc. Many research studies have reported various benefits of flipping like increase in efficiency, personalized learning, and save more time for group work and learning skills. This type of practice will help in the teacher sparing more time for working with students individually. It is a student-centred approach wherein students watch lectures online and involve themselves in discussion forums, hence, learn at their own pace. Every student gets equal opportunity to learn, and more time can be spent on activities for promoting deeper and long-lasting learning. This will facilitate the problem-solving ability among students and deepen their understanding. In this way, the flip classroom can be a great help in personalized learning.

(4) Virtual Learning Environment (VLE): It is an online education system that provides access to different courses for students in a virtual environment anywhere, anytime with a device of internet connection. It utilizes various tools for enhancing and replacing face to face interaction between teachers and students in the real world with electronic communication tools like e-mail, discussion forums, chats, etc. The teachers can create and share their presentations, handouts, videos and web links. A teacher usually breaks the course into parts and presents the content stepwise along with assignments. Moodle, Frontier, WebCT, and blackboard are some of the examples of the virtual learning environment. It provides a platform for self-paced and personalized

learning where students can interact and collaborate with others. It provides more flexibility for the learners because of availability of learning material easily. High-quality modules and educational games are used for making learning more engaging, interesting and real-time assessment is used for maintaining consistency. It is a two-way interaction between teacher and student. A teacher can also personalize learning paths for the students as per the requirement of the students.

(5) Personal Learning Network (PLN): It is a network that connects people who are focused on learning from different organizations. The learner learns from others' experiences for professional development. The basic aim of PLN is to exchange ideas, information, resources and support learning on the topic of interest. It is beyond the limitation of time and space because one can easily find people from similar areas on the internet and can start their conversation. Many surveys have shown that students are already using various social media and sources for communication over the internet. However, there is no one in the network who can help them and train them in using these media safely. Teachers can help students in learning in a safe in an efficient way with the help of PLN and it can connect people outside the classroom on the basis of their interest.

(6) Interactive whiteboards (IWB): Interactive whiteboards are also known as smart boards. It consists of a large display in the form of whiteboard which is interactive in nature. The first interactive board was developed by PARC (Palo Alto Research Centre, California) and was used in the office around 1990. Later on, interactive whiteboards were introduced in the classrooms and recently, they have replaced the traditional whiteboards in many countries. These allow the user to interact with the content by using a finger or stylus on the board. A digital projector is used to display the images on the large whiteboard.

Source:
https://commons.wikimedia.org/wiki/File:Intera

ctive_whiteboard1.jpg

Interactive whiteboards provide a platform for sharing and taking notes, annotating content and saving it for later use. It also allows writing on the board surface which can be saved and shared as a digital content later on. In this way, interactive whiteboards have revolutionized education sector and helped in the enhancement of teaching and learning education. These are also popular in the training sector, corporate sector and broadcasting studios. It has been observed that interactive whiteboards facilitate multisensory hands-on learning and result in consistent improvement in almost all the subjects. It can also be used very effectively for brainstorming, group discussions, and promoting cooperation among students. Even, difficult concepts can be easily taught with the help of audiovisual tools available with interactive whiteboards. It has a positive impact on the motivation level, attitude and attention of the student. In addition to this, a teacher can use it very effectively for the repetition of the content for struggling learners. Hence, this interactive display is transforming traditional teaching practices in a progressive way.

(7) Web 2.0: It was invented by Darcy Dinuccci and also known by the name second generation of the World Wide Web. It has various additional features like dynamicity, easy to use, content generation by the user, two-way interaction between user and creator. It allows the teachers and the students to collaborate, research, write and access the content. It can support the teaching goals and learning abilities of young learners as they are active users of Web 2.0 technologies. Web 2.0 has influenced the learning style of students and has blurred the boundaries between the content generator and user. Students get the opportunity to express themselves and interact globally.

Source:
https://commons.wikimedia.org/wiki/File:Herra mientas_web_2.0.jpg

Some of the most popular Web 2.0 tools are blogs, podcasts, YouTube, and wikis. Blogs are similar to diary entries published on the internet, and may contain the author's thoughts, ideas, images and videos on a topic where readers can post comments and feedback. This type of application is used for the exchange and development of knowledge and information can be provided to a large number of people at the same time. Similarly, podcasts are a series of audio and video recordings on the internet. It is a very recent technology invented in Feb 2004 and can be accessed using iPod, computer smart phones or other similar devices. Most of the podcast files are in audio format but sometimes may be available in PDF for EPUB format. Listeners typically use client application software to access the feed, update and download new files.

Wiki is a website run collaboratively with a purpose to provide knowledge to the users. Here, the user gets the opportunity to add, modify and structure the content directly from the web browser. It is run by Wiki software which is a type of content management system. Examples include Ballotpedia, Catawiki, Citizendium, and Encyclopedia Rich site summary (RSS) is a type of web feed which helps the user and application in accessing website updates in computer readable format. RSS constantly monitors the availability of updates on many websites thus saves user's time, which is used to check the websites for new updates manually. In this way, Web2.0 has provided the opportunity to share and collaborate online and made web experience more dynamic and interactive.

3. Advantages of Digital Technology in Education

Digital technology is transforming today's classroom very quickly in many aspects. Some schools have already incorporated digital technology in teaching and assessment. Various research studies report many benefits of using digital technology. Some of them are listed below:

(1) Improvement in the retention of the content: The use of various devices and aids has made learning simpler, easier and the ability to retain content and information of the student's has shown considerable improvement.

(2) Save Time and Energy: Digital presentations and animations save teacher's time in the classroom. In addition, teacher can use his teaching learning material in the form of videos and e-content with adequate updates over and over again. Thus, the time and energy of the teacher can be saved.

(3) Engagement and in-depth learning: The student remains more active, interested and engaged in the learning process. Different demonstrations and activities can be shown with the help of digital tools for better understanding.

(4) Easy Access: The best thing about the digital technology is that learners can easily access information from anywhere beyond geographical constraints. This provides flexibility in the learning, as the student can use and retrieve the content in accordance with his capability and interest. Students can even participate in video conferencing with teachers and tutors in real time.

(5) Open and distance learning: Learning with digital technology provides the best opportunity for the learner to gain education through open and distance mode without compromising the quality.

(6) Personalized and Independent learning: Learning theories are based on the fact that every individual is different from one another in their learning style, grasping power and pace of learning. Teacher gets very few opportunities for personalized learning in regular classroom, but digital tools can solve this problem very easily. Artificial intelligence technology allows a teacher to design individualized learning paths for different individuals where they can learn at their own pace. This feature of technology can become landmark for the education of children with special needs. Along with personalized learning this also promotes independent learning which ultimately brings confidence.

(7) Economical: Although, technology is expensive at initial stage, but it provides many ways to save money. Various organizations and institutions can very easily share and access their content. Somebody sitting in India can easily access various resources available online around the world.

(8) Evaluation and Feedback: Using digital tools, teachers can easily assess the progress of students and can immediately give feedback to students.

(9) Interaction and collaboration: In traditional classrooms, interaction between the student and

teacher was limited only to the classroom and students' collaboration in any group project was also limited. Digital technology has provided opportunity for both teacher and the student to interact with each other anytime, anywhere.

(10) Critical and Independent Thinking: Pupils' ideas may go beyond curriculum, as pupil gets many opportunities to learn from different sources in different forms. Digital learning foster and inspires independent and critical thinking and encourages students to learn further.

(11) Automation of Many Tasks: The technology automated the implementation of many time-consuming and tedious tasks such as attendance, evaluation and grading etc. This saves teacher's time and effort from being wasted that can be utilized for other tasks.

4. Challenges of Digital Technology

The use of digital technology in the classroom has been a controversial issue since its inception. The opinion of the teachers, parents and policymakers continued to be divided on its potential of transforming education. On the one hand, many countries are experimenting with the use of digital technology in pedagogy, and on the other hand, many have shown resistance on its use in education. But technology can also lead to disruptive transformation and various issues may arise when technology is used in informal setting. A teacher may encounter many problems/challenges while using technology in the classroom, some of them are:

1) Distraction and cheating are two basic problems associated with the use of technology by students during testing and quizzes, when it becomes very difficult for a teacher to assess the progress of a student accurately. Students with 24*7 hrs of internet access may get easily distracted from their path of learning and waste their time in undesirable activities.

2) Educators feel more comfortable with traditional methods of teaching and often resist changing and do not want to come out of their comfort zone.

3) Availability of proper hardware and software support in many schools is the major hurdle for teachers. Moreover, teachers do not get proper training and guidance foe effective use of technology.

4) When students learn through their own devices in the school then their devices may differ in features and capabilities. Teacher may be required to give additional instructions for some devices which may need longer time.

5) In a developing country like India, many students and teachers do not have access to technology and internet for different reasons. In such situations, it becomes challenging for teachers to use technology in and outside classrooms especially in rural area.

6) Many teachers believe that technology will fail in transforming classes in positive way and may lead to different issues like safety and security.

7) Health issues like strain in eyes, headache, dizziness and bad posture are very commonly associated with use of digital devices for leaning. In addition, students may feel isolated which may prove detrimental for their emotional development.

5. Conclusion

There is no doubt that digital technology has enormous potential for improving self-directed learning. With increasing use of technology in our lives, teachers are also expected to integrate technology in their teaching. However, digital technology in classrooms has been a debatable issue in many parts of the world and many teachers struggle to use technology even in developed countries. Despite robust online culture across the world, these technologies have been gradually introduced in the classrooms in formal teaching. Many teachers lack orientation for new technology and perceive is a danger of security. Despite the fact that technological integration in the classroom is a complex and diverse process for many teachers, yet, if we consider technology as destructive, means we are losing its great potential from being used in the field of education. Technology integration in classroom is much more than the use of electronic devices, therefore, it requires careful planning before integration. It should match with what a teacher is teaching and how he/she teaches, and professional development of teachers can address issues like digital competency. Education digitalization should not be misunderstood with equipping campus with smart boards and Wi-Fi as these are only the basic elements of digitalization and technology has much more to offer in the field of education. Now the time has come when teachers and classroom must become digitally equipped in real sense.

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