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Technology in Education: A Review

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ABSTRACT

This literature review analyses the application of technology in education primarily on how these technological innovations influence teaching and learning in schools, colleges, universities and overall everyone interested in even in distance education. Learning and teaching have become more interactive and fun. Students can learn from huge stocks of study materials outside of their regular textbooks. Learning has got the extra advantage with the personalized attention catering to individual needs and learning abilities. Educators as well as students happen to grasp 21st century skills. This has increased more competition between students and thereby they have developed much skill wise and intellectually. Collaboration and communication between students have increased fostering team work and social understanding. This has brought equality between different sects of the students from different social background. Global connectedness and quick information sharing have become possible. Research is an area which has got tremendous benefits from technology. Highly sophisticated hardware, devices and software are employed in research nowadays. So many online journals have come up and communication has become easily feasible. For the teacher it has become easy to give feedback, the Optical Mark Reader (OMR) basis of conducting exams takes less time and software based home assignment system saves time. Distance learning has become possible through systems like MOOCs and other university courses through distance mode.

Keywords: Education, Technology, EdTech, Skill, Multimedia, hardware, software

INTRODUCTION

There are a huge number of ways technology has been defined in large number of books. One of the definitions which intrigue most to me is as follows:

"Technology is a systematic application of scientific knowledge to some practical purpose or activity."(Saettler, P.)

The influence of technology on education is a gradual process where several significant contributions are being added day by day throughout ages. Recently, the use of technology in the education system for learning has emerged significantly during COVID-19 pandemic. It helped students gain education while staying at home whereas there was somewhat divide in the availability of facilities particularly in third world countries. People are nowadays concerned how digital tools including Virtual Learning Environment (VLE) and social media influence the lives of students and performance in their education. It is also important to ensure equal access to technology for all the students. Governments have to take initiative steps in this regard. This is the motivation with which we are writing this paper. The use of technology in education requires continuous adaptation, effective training and integrating the technology appropriately (J. Schacter).

Traditional education and education today have got tremendous differences. There are differences in approaches and methodologies. In the past, traditional education primarily relied on teacher centered, black board centered and students didn't have much active role. Also learning materials were confined to textbooks only. Today's curriculum on the other hand, places a strong emphasis on student centered learning in which students actively engage in their education through group projects, interactive discussions and practical exercises. With the ability to access a wide range of digital resources, online courses and interactive learning platforms, technology plays a pivotal role in modern education. (Dr. Lohans Kumar Kalyani)

METHODOLOGY

The methodology applied in this paper is literature review analyzing multiple research papers which focus on the impact of technology on education. Various methods are used in these studies. We reviewed papers which mostly deal with the application side of technology on education, papers which carry some case studies at some particular location (Carmac MCGrath and Anna Akerfeldt, etc.) , papers which deal with global perspectives and also papers which deal with pros and cons of technological methods in education. We apply literature review in an approach used to collect, analyses and synthesize published information (Muhammad Arsyad and Abdul Wahab Syakhrani) related to technology in education.

Technology in Education:

Interactive learning:

Technology provided with interactive and multimedia learning experiences increasing student engagement and motivation to learn in a fun basis. An interactive blackboard (IWB) or smart board is a large interactive display board in the form factor of a white board. The Apple Classrooms of tomorrow (ACOT) initiative, focusing on innovative learning experiences, demonstrated the positive impact of technology on higher level reasoning, problem solving and teacher practices.

Personalized learning:

A flipped classroom, also known as flipped learning, is a modern day instructional strategy that inverts the traditional teaching technique. Instead of delivering lectures in class and assigning homework, students engage with learning material (also videos and audios) at home. This approach emphasizes active learning and student engagement. Virtual Reality (VR) creates a simulated environment that students can interact with. Virtual Reality (VR) applications include gaming, entertainment, training simulations and even therapy. It aims to replace the students' real world view with a virtual one. Augmented Reality (AR), covers digital information onto the real world enhancing the user's perception of their surroundings. AR is often accessed through smartphones, tablets or specialized glasses. AR integrates digital content with the real world.

Techno Pedagogy:

Technology empowers educators with resources for continuous professional development fostering a culture of innovation in teaching methodologies (Dr.Lohans Kumar Kalyani). A teacher can provide a quick feedback on students' performance. A teacher must have proper infrastructure and he must be well skilled in 21st century skills. However for proper teaching modern day infrastructure is will not be enough for a teacher; he must have the proper inclination and interest for efficient teaching. For the teacher it has become easy to give feedback, the Optical Mark Reader (OMR) basis of conducting exams takes less time and software based home assignment system saves time. Messenger services like WhatsApp are being used by teachers for communicating with students and for sharing valuable notes and handouts. There are

so many video conferencing applications through which teachers are seen nowadays engaged in conducting classes and conferencing. Pedagogical technology is aimed at developing teacher creativity and enhancing his abilities to achieve higher level in his professional activity and a teacher has to use pedagogical technology for developing students' intellect, skills and knowledge as architect uses building blocks for construction of a many-storey building (Mark Burgin). The organized approach of record keeping helps a teacher in monitoring and evaluation of student performance, etc. Learning Management Systems (LMS) such as Moodle, Canvas and Google Classroom allow teachers to organize learning materials, manage assignments and exams and communicate with students efficiently. With a structured system, students can access materials anytime and anywhere. In addition, interactive features such as discussion forums, quizzes and video conferencing further enrich students' learning experience (Judijanto & Aslan, 2024).

(Mobile) Learning Applications:

Applications like Duolingo, Khan Academy and Quizlet provide fun and interactive learning experiences through gamification. These applications provide feedback on students' performance. These motivate students to be more active and engaged in the learning process and reinforce their understanding more holistically (Ku & Lin, 2023).

AI enhanced Learning:

AI enhanced learning utilizes artificial intelligence to improve and personalize the educational experience. This involves using AI to tailor learning paths, provide instant feedback, automate administrative tasks and create engaging learning environments. Even AI can evaluate and analyze student performance data to personalize content and provide targeted support making learning more effective and efficient. Examples of AI applications in education include platforms such as Carnegie Learning and content Technologies, Inc (Yang, 2021).

Blockchain Technology:

Blockchain technology allows transparent information sharing within a business network. A blockchain database stores data in blocks that are linked together in a chain. It can be used for managing academic records and educational certificates. The blockchain system gurantees the security and authenticity of educational data because transactions recorded on the blockchain cannot be altered or falsified. Universities and educational institutions are starting to use blockchain to issue digital certificates for their graduates, which eases the verification process for companies and related parties. Blockchain also opens up opportunities for lifelong learning where academic achievements from different institutions can be recorded in one easily accessible and globally recognized system(Ting, 2022).

Global cooperation and connectedness:

With the help of Internet nowadays global cooperation and connectedness has become feasible. Apart from obtaining information from any site we can now share anything over internet. E-mail and Messenger services provide easy sharing over internet too. Nowadays research activities have also become easy due to the availability of the Journals over the internet. It has become quick communication possible now.

Digital exam:

There is wide prevalence of digital exams in many countries. Some of the exams are conducted even worldwide. Here questions can be set randomly, answers can be evaluated secretly and automatically, takes less time. There is provision of Optical Mark reader (OMR).

Edtech as global content provider and distance learning:

Consider MOOCs. MOOCs came to wide public attention in 2012 and brought the promise of being a new force in higher education, promising to revolutionize but also disrupt traditional higher education (Ross et el., 2004).However, even though MOOCs offer the promise of open educational resources (Czermiewicz et al., 2017), the broad transformative and previously promised revolutionary effects on higher education learning have yet to materialize (Eisenberg and Fischer, 2014,). Nowadays, so many universities offer distance degree and certificate programmes.

Scientific and Humanities research:

Research is an area which has got tremendous benefits from technology. Highly sophisticated hardware, devices and software are employed in research nowadays. So many online journals have come up and communication has become easily feasible.

Cloud Technology:

The development of cloud technology (cloud computing) enables more flexible access to educational resources. Through cloud technology, students and teachers can access learning materials, assignments and other resources from various devices and locations at any time (Tang, 2021)

CHALLENGES:

The application of technology in education also presents many challenges. Issues such as unequal access, digital literacy gaps, distraction due to gadgets, access to inappropriate content, risk of cyberbullying, data privacy concerns and over dependence on technology are concerns that must be handled by teachers and parents. Therefore, there must be some regulations and policies, as well as sufficient guidance so that the impact remains positive and constructive for student development. Need for effective teacher training is also inevitable. The mere existence of technological tools is not sufficient to assure their adoption and use (Mark Burgin).

CONCLUSION

Technology when effectively used in education systems, bring tremendous benefits such as student performance, positive learning attitude and high quality research. For that teachers' and parents' guidance will have to be appropriate. Governments must take some quality policies in this regard.

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