



# Use of Emerging Technologies in Education system: An Overview

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ABSTRACT

*Education is considered the key to development in all over the world. Education has evolved over the years. The evolution of In all aspects of educational process including the nature of classrooms, quality of content, methodologies, mode of students' engagement, and evaluation the advancement of Emerging Technology (ETs) plays vital role. The emerging technologies impact effectively in learning and teaching to bring the best benefit to learners and teachers. Educational technology has changed the face of education over the years. Commonly it is said that every teaching and learning activity is influenced by the technology present at a given time. Emerging technology is generally the introduction of computers and the related technological devices into the educational field. India has recently been advancing communications technologies at a level and step unlike any other region. Equally, online educational information systems have a huge amount of data related to students in digital education. Researchers and educators alike recognize the numerous benefits of information and communications technologies for teaching and learning. This paper presents an overview of emerging technologies used and innovations in education system.*

**Keyword:** - Emerging Technology, Digital education, ICT, AI, Machine learning

## 1. INTRODUCTION

Generally, the profession of teaching considered reputable and decent. It seems, by all accounts, to be a way of moving information starting with one age then onto the next in the class rooms. It is stated that teaching is a plan to change the psyches of new students to adopt new things that they really don't have a clue [1]. There is a difference between the developing minds and new learning brains which is not a simple task of moving information.

The impact of technology on learning and teaching is often at the lead of demands, mostly from those who dictate the funding available to pay for technology within education systems [2]. Humans continue to develop creative ways of doing things. Thus, over the last centuries [3], there is a continuous change in the teaching and learning methodologies. Teaching and learning methodologies are continually changing based on the technology presence at each developmental stage of education. The fast adoption of cell phone technology in both rural and poor regions has been a surprise and it is providing new visions for rural and other disadvantaged areas and people [4]. According to Hussan Munir et. Al. Artificial Intelligence will have gradually important role in higher education since it allows students to have a personalized approach to learning issues based on their own unique understandings and preferences. The technology is grasped as both essential and universal to modern life in all over the world [6]. In the past decade, it is found that there is a transformation of technology and the Internet in education systems. The ICT tools are used, and this has directly impacted the lives of students and teachers.

## 2. LITERATURE REVIEW

Digital learning is nothing but technology enhanced learning which has digital tools for both teaching and learning. In the teaching and learning process, technology plays primary step of the delivery of information to learners. The assimilation of emerging technology into the learning process will help learners for development and by using technology they can improve their academic achievement [3].

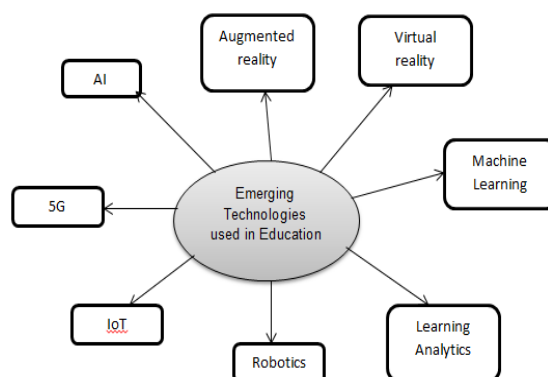
Technology can also be used as a means to develop and foster students' critical learning skills, collaborative abilities, and overall engagement with the curricular content. The time and location are no longer of great significance to the teaching and learning processes [6]. The ICT permits students learning space that can be adapted and personalized to the individual student's needs and abilities. AI-based digital learning solutions can adapt to individual students' level of knowledge, learning rates, and desired goals to get the most out of their education [5].



Also, it is possible to evaluate students' previous learning histories to identify weaknesses and offer courses best suited for improvement. Digital education is effective use of digital technologies in student learning and teaching. According to Ibtehal Talal Nafea [7] Education is no longer just the teaching of text or requiring the student to memorize manuscripts. It is an activity with measurable goals and results. Along with the developments in the technology in recent years, machines also had a big role in our lives [8].

### 3. DIFFERENT TECHNOLOGIES USED IN EDUCATION

Education systems are integrating emerging technologies, such as Augmented Reality, Artificial Intelligence, virtual reality robotics etc.



**Fig -1:** Emerging Technologies in education

In this paper, study of using emerging technologies in education systems is presented.

#### 3.1 Artificial Intelligence in education

AI education system is generally collection of intelligent algorithm, teaching contents and data which can be divided into two parts, i.e., system model (including learner model, teaching model, and knowledge model) and intelligent technologies [9]. AI has been implemented in the education, concentrating on administration tasks, instruction, and learning. The program Knewton, provide instructors within built functionalities to evaluate performance, grade, and provide students with feedback to ensure continuous improvement in learning [10]. LIJIA CHEN et. al. stated that the use of AI for instructional purposes or as a pedagogical tool has had a major impact on this facet of education. It has improved effectiveness, efficiency, and quality of the work done by teachers.

#### 3.2 Machine learning in education

There are some studies in order to determine the abilities of students in higher education [8]. In 2007, a study was carried out at Pamukkale University, where the students identified as risky students according to the failure in mathematics course. They used machine learning technology for it. In the study, 289 students' data were used for training and 145 students' data were used for testing. As a result, the accuracy of estimated of passed students is 86 %. Bo Wu et.al. [11] Presented an analysis study of BP learning algorithm with machine theory for prediction of college student performance. They applied BP Neural Network to the comprehensive evaluation of examination results which use four evaluation indexes to evaluate the quality of examination papers i. e. reliability, effectiveness, difficulty, and differentiation degree.

#### 3.3 Augmented Reality (AR):

AR for education has also proficient investments. For example, in 2017 Google released the AR Expedition application offering a low-cost AR classroom experience with currently over 100 different study materials. And students need a phone that supports either ARCore or ARKit and the application installed on their phones.

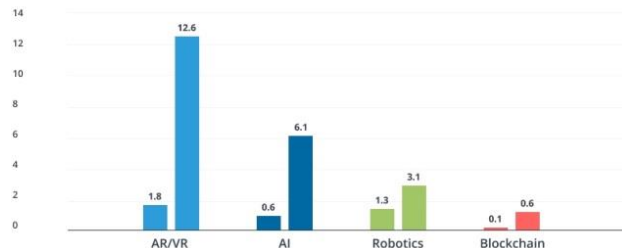
#### 3.4 Virtual Reality

In upcoming years the virtual reality (VR) in education is very interesting and full of potential. With VR, the digital representations of teacher and students can possible with distance learning tools. Teachers can transport into VR world and guide students. In VR, rather than providing ready-made knowledge by traditional way teachers will be focused on creating conditions for exploring it. The properties of VR learning are immersive, easy to use, meaningful, adaptable, and measurable. MEHRYAR NOORIAFSHAR et. al.[12] stated that using virtual reality, we



can enter and interact with a world that either does not exist or it is difficult to access due to costs or safety reasons. Figure 2 shows growth of these technologies in education systems globally.

**Growth in Advanced Technology in Global Education  
2018-2025, USD Billions**



**Fig -2: Growth of emerging technologies in Global Education**

### 3.5 Robotics

ICT has enriched the ways of accessing knowledge, researching, communicating, socializing and succeeding at all levels of education [13]. Educational robotics is a latest innovation in technology that can be used for educational purposes by providing learning environment in which people involve in the design and construction of robot creations. It consists of educational activities that reinforce specific areas of knowledge and skills developed in students through the design, creation, assembly and operations of robots [13].

With this Automation Technology which make use of mechanical, electronics and computer based system students are aware and familiarize with current production processes.

### 3.6 Internet of things (IoT)

IoT devices in the classroom or in laboratory activities can enrich the learning process with innovative ideas and also it increases student motivation in much faster and effective ways.

IoT devices are the additional feature in existing digital technologies used in teaching and learning with the help of smart boards, LCD panels, speakers, cameras etc. Most of IoT courses involved hands on practices including hardware platform like Raspberry Pi, Arduino, Microbit, software platform e.g. C, Java, Python etc. It also includes sensors, actuators, jumper and other components, cloud platform, network communication platform e.g. Zigbee, Bluetooth, WiFi etc.[14]. This will suggest higher level of personalized active learning environment for the students.

## 4. CONCLUSIONS

From the study it is found that emerging technologies plays an important role in increasing student's interest in learning and useful for both teacher and learning. The use of these technologies will lead the classroom into the smart classroom. Machine learning with AI has started opportunities in learning environments which are highly personalized. The use of these platforms and tools have empowered and improved teacher effectiveness, efficiency, as a result resulting has improved instructional quality.

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