THE IMPACT OF COMPUTER SCIENCE ON EDUCATION

Shresth Agarwal

The Millennium School

ABSTRACT

Computer science and its different applications have drastically revolutionized the whole world. Computer technology is an essential part in every walk of life. Education system is one of the most developed sectors witnessing the utilization of technology as a magical wand. Teaching and learning methods with the emergence of computers has converted dreams into reality. The Internet, virtual reality, and artificial intelligence are the new ways of learning. This paper focuses on the emergence of the traditional education system and the impact of computer science in both positive and negative ways.

Keywords: Internet, Virtual reality, Artificial intelligence.

Introduction

The field of Computer science(CS) has had a great impact on the way we live and learn. Computers are being used in every field of life, including education. In 1970, computers were first used in education with aids such as calculators and word processors. Nowadays, IT has made its way into almost every aspect of our lives. According to J. T. Fouts, IT's first use in education was in 1970 with computers and word processors, but now it is used frequently in research and business arenas but not as much in education systems. The use of computers in multiple fields like banking, marketing, medicine, research, administration has been widely accepted in the world. Similarly the education system is also witnessing the great revolution after the emergence of computers, IT, internet and networking technologies.

In earlier days, teachers were not much aware of the need for integrating computers into their classroom activities. Moreover, it was impossible to study in foreign universities without leaving home. But today's scenario is completely different because computers make it possible by using various technologies such as online education, distance education and Computer Aided Courses (CAC) in the field of education. No doubt computers have become essential for

everyone in every field. Teachers now started using technology like smart classes, LCD projectors and laptops which enable them to make effective learning processes more effective. Through the process of digitization where information is converted in digital format, classroom learning has been significantly changed in online learning, having its own different levels of impact.

With every passing day there is a new dynamic change in the education sector. The enthusiasm and curiosity of students has changed the mental shift from textbooks of bookstoresto online learning through multiple platforms like youtube, google etc. Kindles,online textbooks,online courses and online exams are the most convenient and popular way of learning and teaching through digitization. Adaptation of the computer system in education has changed the scenario. Specially, unexpected lockdown happened during covid-19 pandemic, drastically turning the traditional education methods upside down at a very fast pace.

Education then and now:

Education is a process of acquiring general knowledge, developing the powers of reasoning and judgment, and preparing oneself or others intellectually for mature life.

Before writing was invented, education was passed from one person to another through speech and other means of communication. Songs, legends and religious rituals were also often used to communicate essential information between generations. Education at this point was strictly oral; students learned by memorization. With the invention of writing, however, education began to change significantly.

The Middle Ages saw an increase in education and connected with education. Few students used to study at monasteries, temples, mosques, religious places or medieval universities.

After this middle age era lots of changes happened in the knowledge and education department. Dependency of learning on religions was eliminated with the establishment ofelementary schools for education of younger ones. Government started actively participating in civil education by passing the law of making basic education mandatory to all citizens from any sector of society, or any socio economic status. Gradually, the learnings in various domains like math, science, language, social studies etc. started through the establishment of schools, colleges, universities and various educational institutes.

Despite many modern techniques of imparting teachings, the traditional Guru- Shishya method of teaching and learning has never lost its importance till now. Teachers play a pivotal role in a learner's life. The following are some pros and cons of traditional education methods.

Pros:

- One on one connection between teacher and student.

- More attention on academically weak students.

- Student can learn by observing the teacher 24*7.

- More focus on important parts of the syllabus.

- Personal experience with the teachers laid to many important value additions in teachings.
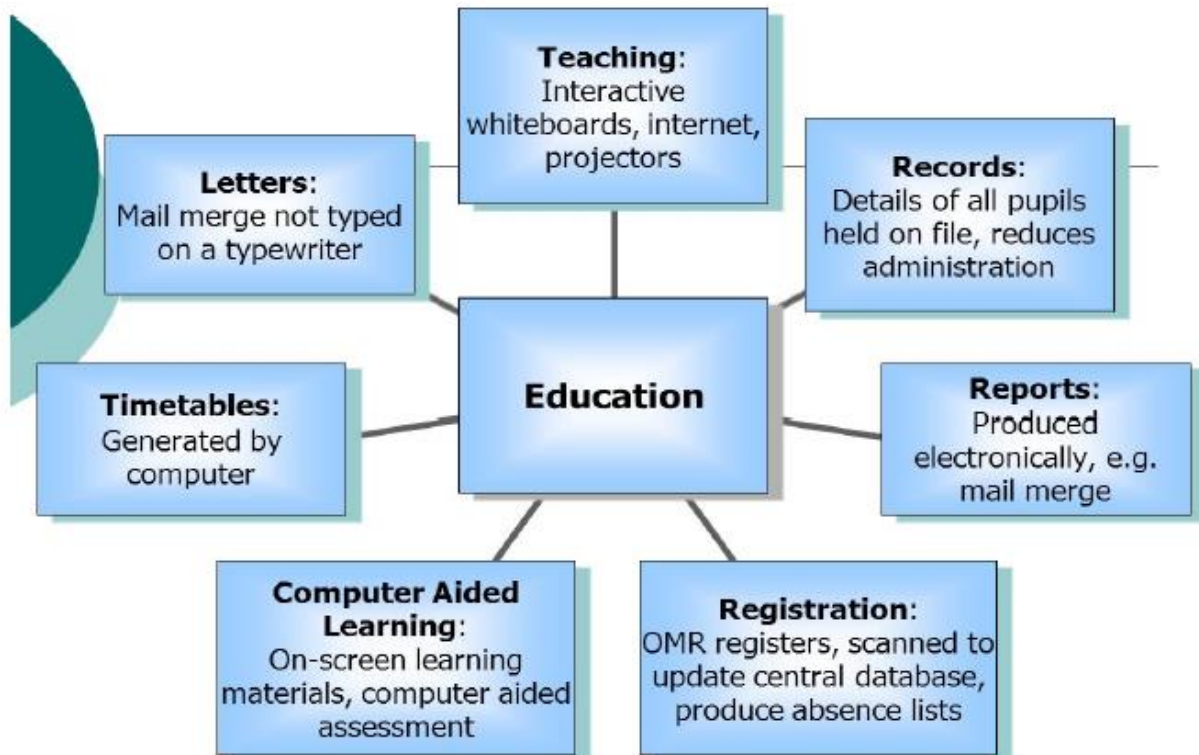
Cons:

- Limited scope of learning restricted to teacher, student and syllabus.

- Only exam oriented learning.

- Not dynamic learning.

- Lack of practical application of learning.

- comparatively costly.

- Geographically limited

Positive impact of computer science on education:

India has a traditional and computer based education system running in parallel. Although old learning techniques can't be completely detached, we are moving towards advanced technologies through computer and information technology. Though there are a handful of benefits of the traditional education system, the advantages of computer based learning in today's fast paced world cannot be denied.Some of them are mentioned below:

Figure 1 : Impact of computers on education.

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- **Effective teaching & learning through multimedia:**

In traditional methods of departing education, books or models were the means through which teachers used to teach the concepts to learners, however with the use of computer technologies this method has been enhanced. In educational institutions, such as schools, colleges and universities, computers are widely used to aid the learning of students. It is an easy and effective way to use multimedia(sound and visual effects) in preparing lesson plans for students through powerpoint presentations. These are shown on projectors or LCD in the classroom. Concepts like phoenics can be taught very effectively. Gamified versions of many lessons and topics have been very effective for teaching kids at elementary levels. Advanced lessons can be prepared in very less time and effectively delivered with greater impact onstudents.

- **Large and organized information storage:**

Storage of huge amounts of data through digital storage devices is yet another major benefit of computers. It is now easy to store and download lots of educational materials like video lectures, notes, presentations, question banks, mock tests etc in computers. Also the new technique of cloud computing is the most effective way of storing data with great security and without the threat of losing it. The same centralized storage of data can be used by multiple users or students from any corner of the world.

- **Quick and faster access to data:**

Usage of the internet and centralized stored data aids in quick and superfast access of required information. The 4G/5G revolution has made data available in lighting speed. Hence the whole universe is just a click away. Accessing the research papers, manuscripts, documents, educational notes from any corner is possible only due to these technical advancements.

- **Easy tracking of ward's progress:**

Schools and universities have developed many utilities and apps for parents convenience to track the detailed progress of their ward. By using computers, internet and even mobiles nowadays attendance reports, marks in various school assessments, details of involvement in other co curricular activities etc are available on fingertips. This is a boon for parents to keep track of details in a very time saving and effective way.

- **Fast communication and correspondence:**

The huge communication gap in traditional teaching learning methods has been filled by the technology in a very smoother and quicker way. The facility of video and audio conferencing has changed the meeting scenarios. Multiple meeting apps like zoom, google meetetc have made it possible to learn and teach from and to anyone located remotely in almost a similar way of one on one teaching.

- **Distance Learning:**

Many technological innovations like ebooks, online databases, teleconferencing, video conferencing, cloud computing are widely used in distance and online learning.Virtual classrooms are the demand of time. Students get the same feeling of classroom learning and can raise doubts and get clarification in live sessions just like real time classroom.This all is possible without going to any other place.This is cost saving and independent of time and place. Recorded learning sessions can be easily repeated and watched if missed by the student. Lots of students from remote locations can be benefited by this method of learning.

- **On-Line examination:**

The pattern of examinations has been changed due to online examinations. students can appear for exams from their nearby centers.It also ensures fast and biased free, fair and impartial results. Many popular exams like GRE, SAT, GMAT etc. are being conducted worldwide through an online web based examination system.These are time and cost saving ways of appearing these national and international level exams.

There are many more advantages of this technological implementation hence the computer has become an inseparable part of today's education system. However, with all the advantages of new adaptations there are some pitfalls associated with it. Some of them are highlighted here-

- **Need large expenditure:**

The pen-paper less education these days is completely dependent on computer structures or advanced devices. Installing and maintaining these devices is an expensive deal. need of updated softwares, anti virus softwares are essentials for the smooth running.which increases the learning cost in many ways. Also the teachers need to take extra efforts in learning the adaptation of new teaching methods like making presentations, making videos, searching for advanced teaching materials etc.

- **Lack of satisfaction:**

As new technology reduces the direct interaction between teacher and student, there is a lack of satisfaction in teaching and learning. According to psychological findings interactive one on one learning is the best suited for human minds. The online learning has skipped the interaction part and hence is not very much satisfactory.

- **Time consuming in many aspects:**

Though the 4G/ 5G internet has been working at lighting speed but in case of using it in school context, updating and connecting with various software and hardware parts are really time consuming as it reduces the limited interaction and teaching time of teachers. Any small technical error which is very obvious can lead to major time wastage in detecting, repairing and correcting it.

- **Misleading information may cause problems:**

As there is no authenticity filter while uploading content on websites, in the competition of getting more rankings and ratings many times misleading information is posted which is

followed and used in various contexts by students etc, this can put them in problematic situations sometimes. Hence one can not blindly trust on these world wide pieces of information.

- **Increased distraction among students:**

While using mobiles, laptops and other gadgets for learning purposes, students get easily distracted by the social media posts, and other contents. According to researchers 80% of students waste their time by getting distracted while making use of gadgets for study purposes. This has also been observed to be threatening for their mental and emotional health.

- **Lack of connection with real world:**

The use of advanced technology has cut the connection of learners with the real world. students don't find comfortable connections with their mentors or friends.They feel helpless to share their problems with others. hence interactive learning is suggested along with online learning for better practices.

- **Not affordable for economically weak sector:**

People from weak socio economic sectors find it difficult to afford computer based learning as it requires investing huge amounts of money for gadgets, internet connections, online transaction systems etc. hence this education is not approachable for students of all categories.This creates a huge gap between the learning of rich and poor people. which is very harmful for society.

- **Replacement of physical books with ebooks:**

physical books are rapidly being replaced with electronic books(ebooks) hence students don't need to carry and purchase bulky books. but continuously steering to the computer devices or smartphones have increased the eyesight problems in the younger generations. The harmful light emission from these devices needs creating deformity in eyes hence are not the bestreplacement of physical books.

As every coin has two sides, similarly computers have both kinds of effects on the education system however if managed wisely and carefully it can be used for the best ofeveryone's benefit.

Conclusion

Role of computer based education system specially after recent covid-19 pandemic has proven that it is the non separable and highly integrated part in students life. Witnessing new learning services and advanced teaching methodologies everyday, it is clear that computers are there to stay as a crucial part of everyone's life. The new technical ways made the education more

interesting and elaborative hence students can learn without getting frustrated and bored. However the values imparted by traditional methods of education (Guru - Shishya tradition) will never lose its essence as it is the basic and fundamental stone of this whole education industry. Elementary level education still needs the old traditional methods of teaching learning to create a robust student ready to face future challenges. Traditional methods with the right blend of advanced technologies can create wonders if used wisely.

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