The dawn of the digital age has brought with it tremendous change across all sectors of society over the past 50 years. No field has felt this shift quite like education. Teachers and students alike have had to adapt to massive change in distribution of content, means of assessment and more at every level of education. Primary school children play educational video games. Secondary school students access exam material and research information online. Universities deliver entire programs over the internet.

The landscape of the teaching environment has been shaken to its very core by the technological revolution. It was a gradual process of change over time, but the high-tech learning of today is a far cry from the classrooms and textbooks of the past. The advantages of this transformation are many and strong, but so too are the downsides.

Computer assisted education or computer assisted learning (CAL) is a rapidly evolving field in the application of computer science that is currently showing no signs of slowing its development. However, this study will begin by looking back at where it grew from.

History of CAL

Computer assisted education, “as the name implies, is the use of electronic devices/computers to provide educational instruction and to learn. Computer assisted learning can be used in virtually all fields of education, ranging from TV/DVD play-learn programs for kindergarten kids to teaching quadruple bypass surgery techniques in medicine. CAL is developed by combining knowledge from all fields of education/learning, human computer interaction (HCI) and cognition.”(Olorunosebi, n.d.)

Computer assisted education has been prevalent for a number of decades. According to Jessica Scott “It might shock you to learn that some form or another of Computer Assisted Learning has been taking place in classrooms since the 1960s”. (Scott, n.d.) The scope of CAL is not only limited to computers, but also by definition includes other forms of technology like CDs, MP3 players, interactive whiteboards, and any other form of electronic present in the classroom. It is unsurprising that it was adopted at such an early stage to help and assist in the classroom environment. It enabled better engagement from the students, as well as aided teachers of a broad variety of subjects. Music teachers could playback tapes. Engineering teachers could have their students model their projects with computer software. Other subjects benefited greatly from the ability to give real visual representations of topics that may not be possible to demonstrate in a classroom, like a geography teacher showing footage of the eruption of a volcano. The opportunities CAL gave in enriching the quality of learning achieved in the classroom was only limited by the technology itself.

Another area which has long made use of computer assisted learning is that of language, which has been making use of technology as early as the 1960’s. Known as Computer Assisted Language Learning or CALL, a massive variety of benefits were soon found in the application of technology in language teaching. As Al-Masri states “the basic idea revolves around computers being able to provide a language-learning environment to the learner without the presence of the teacher.” (Al-Masri, 2019) The wealth of foreign language resources available on the internet steadily grew over time, and in more recent history the development of instant messaging technology allowed for communication with native speakers of one’s target language with a never before seen ease. Additionally, this particular field of language has long been of particular interest to those working in artificial intelligence and machine learning, as evidenced by the advancement of Automated Speech Recognition (ASR) and other such attempts at automatic translation.

“In the early 90's education started being affected by the introduction of word processors in schools, colleges and universities. This mainly had to do with written assignments. The development of the Internet brought about a revolution in the teachers' perspective, as the teaching tools offered through the Internet were gradually becoming more reliable. Nowadays, the Internet is gaining immense popularity in foreign language teaching and more and more educators and learners are embracing it.” (Scott, n.d.)

As stated by Scott, the widespread adoption of word processors and word processing software in the 1990’s brought massive change, and was another large leap for CAL. This introduction of computing into the school environment soon brought about dedicated computing classes, teaching the fundamentals of software packages such as Microsoft Office. This, coinciding with the growing popularity of home computing, became hugely beneficial, as the rapid shift to computing in the working world necessitated the introduction of employees who had prior experience with a computer.

Recent history has seen the further evolution of online learning. Universities have their own sites with which they may organise their modules, delivering content and accepting the submission of assignments, cutting out much of the need for the use of paper in many disciplines. The advancement of video and streaming technology have made it possible for whole courses to be delivered entirely online. This extends beyond just traditional universities, whereby any institution may deliver content and certification via online means.

Conclusion

The impact of technology on our society has been and continues to be immense, and the educational sector is evidently no different. In an ever-changing world there arises many new advancements and improvements in teaching and learning, as well as numerous amounts of unforeseen challenges. The limits of what it can achieve are as boundless as technology itself, but exercising caution and restraint in the speed of its implementation is of vital importance.

The coexistence of education and computers will no doubt continue to be a topic of inquiry for researchers of learning and developers of technological solutions alike for many years to come.

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