

A REVIEW ON EFFECTIVENESS OF COMPUTER ASSISTED LEARNING

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Abstract

Any learning, mediated by a computer and doesn't require direct interaction between the user and human instructor in order to run is called Computer Assisted Learning(CAL) .CAL also includes online courses and supplemental course materials used in colleges, home schooling and distance learning .Basically , any type of technology that can be used to learn most likely falls beneath the umbrella of computer assisted learning. CAL makes learning more interactive and engaging. The advancement in Computer Aided Learning doesn't mean it will eventually replace the traditional educational system. But in the situation of a pandemic like this we all are choosing computer assisted education. It would have been very difficult for us to continue with our educational system in this pandemic period without the facilities offered by CAL. In this paper, we examine the effect of computer assisted learning in students' deep-rooted development. According to the result it indicates that education technology have long lasting positive effect on a variety of outcome and CAL should be applied to improve teaching quality. By using CAL it will be possible to eliminate lingual, regional and ethical biases between teachers and students. Also it can be effective in reducing the rural-urban education gap.

Keywords: Computer Assisted Learning, education, technology, pandemic, lingual, regional

1.Introduction

Computer aided learning simply means learning with computers. If we skip through history and ignore Abacus, the device which resembles computer assisted learning came from cognitive psychologist, Sydeny L Pressy from Brooklyn, USA. Alan Turing's Nazi-busting first-generation typewriter-like machine had a window which displayed questions and multiple choice buttons that recorded answers and it still resembles the most advanced forms of mobile learning that we perform today on our phones. After this, an another type came from Stanford University called Teletypes used to perform arithmetic and spelling drills to elementary school students of Silicon Valley in 1960s. Illinois University became the first to share courses materials online in 1960 and they provided first online course in 1986 via the Electronic Learning Network. Computer became ubiquitous in schools by 1980s, as a result of this variety of computer assisted learning system came into existence. The world of eLearning started to flourish as home internet connections started to appear and it coincided with the launch of a fully functional Search Engine.

Now the increasing penetration of computers and the internet has profoundly changed the way the educational system works. Computer assisted learning enables students to learn their contents easily and effectively. This makes the learning more interactive and effective and it eventually contributes to the overall success of the learning strategy. In addition to increasing productivity inside the classroom, technology can improve the delivery of high quality education to underserved areas. CAL also helps in reducing the educational gap between urban and rural areas and thereby reduces the inequality in educational sector.

2. Computer Assisted Learning

- Computer-assisted learning (CAL) may be defined as any learning that is mediated by a computer and which requires no direct interaction between the user and a human instructor in order to run.
- CAL doesn't just involve computers, it also includes the use of electronics such as CD and MP3 players, DVD players, tablets, smartphones, televisions etc.
- CAL presents the user with an interface which allows the user to follow a lesson plan and self-directed access to particular information of interest.

3. Advantages of CAL

- CAL is individualised. It allows each student to work at their own pace, unaffected by the progress of other classmates.
- CAL can enhance reasoning and decision making abilities.
- Some research shows that on average, students retain 25-60% more material when learning through CAL compared to only 8-10% in a conventional classroom.
- CAL reduces the complexity of topics, makes them easier to understand before moving on. Here information is presented in a structured form. Since it involves small learning units and short activities, it is also referred as Microlearning
- CAL programs can give quick responses as the engagement of students is always documented. Through this students can understand the topic and also find their mistakes. It also helps in increasing their learning ability.
- CAL is more interactive and engaging. CAL can encourage student participation and learning of a vast variety of multi-medias, in a way more effective than books and lectures. The visual and audio interfaces that CAL provides are more interesting and exciting than the conventional teaching methods in the classroom. CAL also offers a solution for students who have a hard time focusing.
- CAL offers endless opportunities for practice and builds high-aptitude students. Since digital exercises and questions are easily produced and varied, CAL allows students to practice as much as they need.

4. Limitations of CAL

- When custom-built, CAL can be expensive. Even though ready-made CAL software are affordable, they might not meet our exact education needs.
- Installing and maintaining CAL hardware and software takes more time and effort.
- Even though most of the CAL programs are automated, you still need to know how to operate it. Otherwise, it's useless.
- As technology advances, CAL programs can quickly become obsolete since rapid development and innovation takes place in the CAL industry.
- CAL technology has a learning curve. Traditional teachers may not have the time or desire to learn CAL. They may fear that CAL will replace them. But in most cases, teachers just don't understand how to implement CAL or think it doesn't meet their requirements.
- CAL can be a cause for distraction, especially when used in a classroom setting. The long-term impact on students' attention spans can be concerning in the long run.
- There is always the risk that students and instructors may depend on CAL too much. It could lead to learning deficiencies in other fields like hands-on experience. Overdependence on CAL can result in less socializing and increased isolation among students.

5. CAL During Covid Pandemic

It is estimated that COVID-19 has affected 91 percent or more of the global student population. The unexpected closure of educational institutions due to the spread of COVID-19 forced the authorities to adopt alternatives to traditional schooling techniques. There was also an unavoidable requirement

to use technology in education during the pandemic. Cal provides more flexible, usable and efficient face to face learning. Even before the pandemic period, education technology was already growing day by day. When the opinions of students all over the world were considered, during the COVID-19 pandemic, it was found that most of the students had a positive impression on the use of CAL. CAL was proven to be the best among all the educational techniques during the lockdown period.

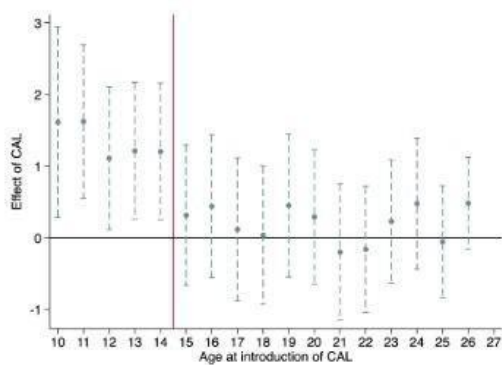
Classifications	Respondents	Percentage
Yes	112	86.8%
No	7	5.4%
Not Sure	10	7.7%
Total	129	100

Among 129 respondents, around 86.8 percent of students are opinioned that e-learning is very useful during the quarantine time. Around 7.7 percent of them is the attitude that it may be useful since the students are pursuing online competitive examinations. And only 5.4 percent of them are not positive about e-learning during quarantine time. It is evident from the table, maximum number of respondents expressed that e-learning is useful and more satisfactory.

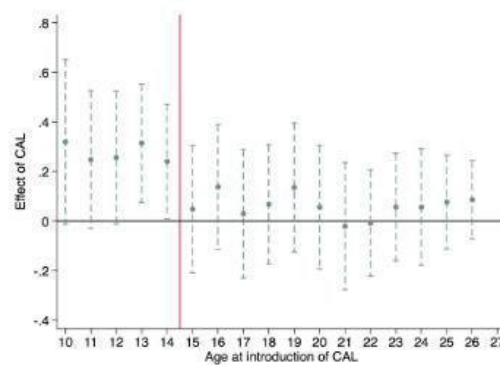
6.CAL In Rural And Urban Education

There is a large gap between rural and urban education in most of the countries. According to the World Inequality Database on Education, the education completion rate in urban areas is larger than rural by 288% in low income countries, by 62% in lower middle-income countries, by 46% in upper middle income countries, and by 18% in high-income countries. The traditional solution to solve this problem is to provide the rural schools with better resources and high-quality teaching personnel. But mostly this type of programs became vain since the high quality urban teachers are not ready to relocate to rural areas. The advancement in Computer Assisted Learning introduced new and better ways to solve this problem. The introduction to technology offers vast opportunities to improve the quality of education delivered in the classroom. CAL allows urban teachers to connect with rural students through virtual platforms. This results in access to quality education to rural students without relocating to urban areas.

According to the studies, the exposure to CAL in middle school significantly improved students' academic and critical thinking skills. The following graph shows the effect of CAL in student development according to the age they first got exposure to it.



A. Years of completed education



B. Math skills

The introduction to CAL at early age also increased students' labour skills and they are more likely to get employed in jobs that require more cognitive skills instead of manual skills. It has also been resulted that early exposure also results in increased Internet and computer usage by 15% even after several years of completion of middle school. ie, the effect of CAL lasts for many years after the initial exposure.

It has been proven that early access to CAL will improve the quality of education received in rural areas and also increase in the usage of the internet by students in their future life. The increased usage of the internet will provide the students a large pool of knowledge and education from best teachers across the globe. This shows that Computer Assisted Learning is an effective way to close the education gap between urban and rural areas.

Conclusion

The Covid pandemic has shown so many faces of Computer Assisted Learning. Without the advancements that we achieved in the field of CAL, it would have been very difficult for the world to continue with the education sector. This 2 and a half years has shown the power of CAL. But even when we talk about the positive sides of CAL we still have to face so many challenges in making use of CAL facilities in its fullest. Of course CAL can minimize the gap between rural and urban education. But the expense in implementation of facilities and lack of technical knowledge among rural people still make a big barrier for the implementation of CAL in its fullest. If the Government makes better plans and gives assistance to rural schools for digital upgradation of classrooms, providing CAL facilities and give technical training to teachers CAL will be an effective solution to minimize the rural-urban education gap.

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