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Computer aided education

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Abstract

While all sort of written information were widely used in education, studies showed that visual perception is very important in learning. For this purpose new teaching strategies were developed using computer. The aim of this paper was to emphasize roles of computer in education and to make a comparison of computer aided education vs. traditional education. Computer aided education (CAE) system is a key to improve the effectiveness and the quality of education system. Computer education forms a part of the school and college curricula, as it is important for every individual today.

1. Introduction

Computer aided education eases the process of learning. Life without computers would seem almost unimaginable for many individual using computers daily.

Computer aided education (CAE) is not a new fact. In the early 1960s, Stanford University psychology professors Patrick Suppes and Richard C. Atkinson experimented with using computers to teach math and reading to young children in elementary schools in East Palo Alto, California. Stanford's Education Program for

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Gifted Youth is descended from those early experiments. In 1963, Bernard Luskin installed the first computer in a community college for instruction, working with Stanford and others, developed computer-assisted instruction (Wikipedia). Usage of computer in data communication has commenced in 15th Century. Most of the individuals in 15th Century were extremely ignorant.

Computer aided education eases the process of learning. A life without computers would seem almost unimaginable for many individual using computers daily. Traditional teaching methods and course contents have all been affected by the introduction of computer technology.

Therefore, one case study quoted for showing importance of computer-aided education. Ath. Kehagias and Pan. Vlachos has a research called Melon project for Melon foundation grant to their project, which is fulfilled in The American College of Thessaloniki. They choose American College students for their diverse educational backgrounds. They wanted to design courses, which will teach to the students basic mathematical knowledge (necessary for follow-up courses); and , They want to relevance them to mathematics. And They though thing to keep a fine balance between showing more technical (in which case students will be alienated) and too simple (in which case students will lose interests in the course). Then they organized a course which they can use computer in class. by They using some software packages such as Microsoft Excel and Mathcad. At the end of the course they had also found that it computers did play a positive role, in "sweetening mathematics"; and. And they have found that CAE students were better at it than traditional ones (Kehagias&Vlachos, 1999).

In this paper, types of computer aided education were mentioned such as autonomy, model creation, demonstration, game model, storytelling model, virtual reality, animation, e-books, user created content and distance education. Designing materials for creating computer aided education; text, color, illustrations, sound, video, and characteristic of the learner were also explained. Advantages of computer-aided education (CAE) and comparison for CAE and traditional education were also discussed.

2. Types of Computer Aided Education

Traditional teaching methods and course contents have all been affected by the introduction of computer technology. Education is the main step of all disciplines and should be carried out seriously. In our competing world every individual should learn more and fast in order to take a front row in this competition.

Education is defined as the process of forming an individual identity, becoming sociable and gaining economic effectiveness. It is also the process of constructing the balance between human and the environment by interaction, which has many aspects (Aydın&Sütçü, 1999).

Education is a fundamental part of differentiating from a simple living creature to a thinking human being taking part in social, economic and industrial world. In this highly competing world it is getting more and more important to learn more and faster.

Education is a complex process in which both human and technical resources should be utilized in a carefully balanced way. Traditional teaching practice, learning methods and course content have all been affected by the introduction of computer technology. The challenge is to develop and use modern learning environments in education while the curriculum of university education is continuously evaluated and modified to both include new ideas, thinking and learning methods, and to eliminate redundant material (Kızıl et al, 2004).

Encyclopaedia of Britannica described the word "Education" as follows, which is very difficult to accept today: "Education is a discipline that is concerned, in this context, mainly with methods of teaching and learning in schools or school like environments as opposed to various informal means of socialization" (Britannica Online Encyclopaedia).

As we know and use distance education by means of computers now, the definition of a highly trusted Encyclopaedia became incorrect. Actually changing time and technologies even made the difference in definitions of Encyclopaedias.

It is very well known that learning gets easier if the information could be given by a combination of different sources at the same time as sound, picture and words. It starts with the alphabet only with letters and letters with pictures. It is obvious that if it is possible to teach letters with motion and sound concomitantly, it will be easier to learn. Beside this teaching advantage it will bring another differentiation, which is willingness to learn. Autonomy may be described as the willingness or self-determination of every individual to study and to learn.

Various techniques were described and analysed in order to improve education methods, because it is almost obligatory to learn more in less time in this competing world. This is the aim of many research groups to provide a teaching method for faster learning and better understanding.

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Regardless which theory we believe, computer aided education is of importance for sure. Different application areas of computers are examined and evaluated according to the changing needs and improving technology. New devices and methods have been developed besides autonomy, model creation, demonstration, game model, storytelling model, virtual reality, animation, e-books, user created content, distance education and online education and for sure they will be more development in near future.

3. Designing Computer Based Education Materials

Computers have a wide range of education materials contrary to traditional tools. Text is still the most important tool to transfer information. But there are many different additives to text in computers such as colour, graphics, sound, animation, third dimension and interactive sections**.**

Moreover, in preparation of the computer-based learning materials the characteristic of the learner has great importance. Different learners will respond to stimuli in a range of ways so it is important to be aware of the characteristics of the group you are designing for. You can't design same material to adult and child.

Alan Clarke summarized these factors in details. The factors, which may influence the learners' response, include age, computer literacy, previous experience of computer-based learning, gender, educational experience, learning skills, physical characteristics, reading age, knowledge of the subject and first language (Clarke, 2001).

The best way to transfer knowledge is text. Although computers have various possibilities, text is the most condensed way of giving theoretical information. Computers have many advantages when preparing reader friendly text pieces and when reading pre-prepared texts. Arrangements of paragraphs, headings and subheadings

are important parts of text preparation.

Selection of fonts is a very important subject. The font of a storybook that is prepared for elementary school children should be different than a postgraduate master degree paper. A scientific paper should also have different letters than a joke book.

Moreover colours are very important in our daily life, psychology and mood. Actually the human eye can recognize millions of colours. So colours may be used to draw attention to important points. Setting the same colour for related topics may also be helpful.

Colour is a powerful motivating force. People will often judge coloured products as having a higher value and quality than the equivalent monochrome products. It is an important way of gaining learners' attention, reinforcing key points and segregating information (Clarke, 2001).

4. Advantages of Computer Aided Education

The advantages of computer-aided education can be overviewed in various topics. But for me the most important ones are correction and update possibility of the education materials. Computers in education provide us quick information processing and very importantly the saving of paper.

The roles of computers in education may be summarized as follows.
* The initiation of education may start earlier in preschool children which were not able to write and read yet
* It will be more interesting and attractive to use a colourful software with animations than reading a book especially I children
* Computer education module can help students deeply understand the content with diagrams, pictures and movie clips when needed.
* Softwares are easy to carry, copy and distribute
* Instruction manuel
* Decrease of labour
* Chance of sharing personal experience, ideas and new methods
* Chance of searching in seconds

The uses and advantages for this system are endless. For example, teachers are encouraged to use edutainment

computer-based learning for introducing students to new or difficult lectures or concepts. Times, tables or grammar are incorporated into platform games that use positive reinforcement to encourage children to move onto new difficulty levels. Children are able to pick which times, tables or grammatical problems they wish to tackle in the session. This interactive element is essential to ensure children feel they have some control over their education (Roschelle et al., 2005).

5. Comparison of Computer Aided Education vs. Traditional Education

Computer aided education system is a key to improve the effectiveness and the quality of education system. Conventional education system, which is using a book or hardcopy material, can easily make the student to feel bored and complicated to understand what they have learnt in class. The information need to be digging out from the whole bunch of the book out of nowhere and this might consumes a lot of time. Differ from the computer aided education which is much easier to amend and update the material. Besides, Computer aided education system can reduce publishing and distribution costing. Therefore it worthwhile to replace the existing of the conventional education system with computer aided education (Sabariman, 2008).

Another issue is changing time and changing habits. Traditions, fashion and preferences change from generation to generation. While I am very comfortable with computers my parents are using them with minor problems whereas my grandparents have major difficulty in using them.

Computers have revolutionized common man's life and have brought a dramatic change in the life of every human being. Plentiful information is available on the Internet that can be read by means of a computer. Hence one might not want to be deprived of this new world of information. The information is inclusive of all aspects of knowledge. It ranges from preliminary facts in science to philosophy of life. Almost everything that the books once carried is now accessible through a computer. Everything that the textbooks have is now just a click away! (Oak, 2008).

Information can be presented in different forms over a computer. Information can be in the form of an audio recording or a video clip. Computer teaching is thus much more than just making students read from the screen. It is about providing them with a learning system wherein they can view pictures, watch videos and listen to speeches or lectures. It is about making the process of teaching and learning, interesting and interactive.

According to Manali Oak's paper, writes "teachers are irreplaceable", but on the other hand life conditions

necessitated teaching with computers which may be accepted as virtual teachers. Another extension of this situation is distant education. Distance education may be accepted as third revolution in education. It is obvious that it is the last stage of computer aided education (Oak, 2008).

Ath. Kehagias and Pan. Vlachos has a research related with this subject, which is fulfilled in The American College of Thessaloniki. They choose American College students for their diverse educational backgrounds. They want to design courses, which will teach to the student's basic mathematical knowledge. They want to relevance them to mathematics. And they think to keep a fine balance between showing more technical (in which case students will be alienated) and too simple (in which case students will lose interests in the course). The problem is worsen because in some of our classes we teach concurrently two groups of students: the first group will major in the Liberal Arts and the second in Business Administration.

To fix the above problems, they have found it necessary to continuously engage in curriculum reform. They have been especially interested in computer aided education (CAE) to increase both the learning material and teaching process. They have experienced with software packages such as Microsoft Excel, Mathcad and Scientific Notebook as well as with HTML-based hypertexts for three years.

Their efforts for emphasized conceptual understanding, through the use of graphical and numerical approaches. In particular, in the Calculus course they have used numerical and graphing experiments (in Excel and in Mathcad). They have also experimented with various teaching strategies: we have taught traditional, classroom-based courses, as well as courses almost exclusively taught in the computer lab; they have used collaborative assignments and individual take-home projects.

They have also noticed that students are eager to participate in classroom activities in computer-intensive classes. On the other hand, they have found that when teaching a computer-intensive class the students may become quite proficient in the use of computers and mathematical software, without grasping the mathematical concepts in which are ultimately interested**.**

Their main goal during this phase was to familiarize us with the symbolic math software Mathcad and with teaching computer lab-based courses. They chose Mathcad because of its combination of symbolic math operations with "live" computation (i.e. changes made at some part of a document result in immediate update of the whole document). They found this feature very useful both for demonstration by the instructor and for experimentation by the students.

According to their work's results, it appears that CAE did not make a difference as far as concepts understanding is concerned. More specifically, CAE students were better at conceptual understanding both at the beginning and at the end of the course; but, on the average, they improved at the same rate as traditional students. However, CAE did make a difference regarding general mathematical performance both in absolute and differential terms. CAE also made a difference regarding the attitude of the students to the course (i.e. students liked the CAE course better than the traditional one). Statistics and numbers do not tell the whole story. So it is useful to briefly relate our informal experiences. They definitely felt throughout the course that CAE students were more active and interested than the traditional ones.

They also find it computers did play a positive role, in "sweetening mathematics". They have found that, the CAE classes developed so much momentum, it is particularly important to plan class activities and teaching strategies very carefully so that the learning process does not degenerate into an exercise of computer gaming. Also, they think that some lecturing is still necessary, even in the CAE course; they do not want to revert to 100% lab course because if they revert.

Regarding mathematical performance, they did feel that on the average CAE students were better and remained so at the end of the course. Statistical analysis offers a further significant insight: not only were CAE students better in absolute terms, but they also improved more than traditional students (Kehagias&Vlachos, 1999).

Finally, regarding the understanding of mathematical concepts, they have found that CAE students were better at it than traditional ones. This is substantiated by statistical analysis, which further reveals however, that there was no difference in differential improvement. In other words, statistics suggests (and as of now we have no grounds to dispute this), that CAE students were originally better at conceptual understanding and remained so at the end of the class. A scenario which they found plausible after consideration of the statistical analysis and their subjective experiences is that better students were drawn to the CAE course than to the traditional one. This seems to be supported by the statistically significant difference in GPA between the CAE and traditional students (Kehagias&Vlachos, 1999).

In conclusion, course was a useful improvement over the traditional course and they intend to refine and repeat it. Teaching Mathcad to CAE students created an overhead, which was partly compensated by spending less time in teaching traditional techniques of differentiation and integration.

6. Conclusion

Computer aided education eases the process of learning. A life without computers would seem almost unimaginable for many individual using computers daily.

Internet, which is the source of all kind of information, can play an important role in education. As it is an enormous information base, it can serve as a source for a wide variety of subjects. Search engines are very helpful in reaching the target. It is usually possible to reach the headed information when the clues or keywords were obscure. This is another advantage of computers to thick textbooks.

The importance of computers is evident today and having the perfect know-how of computers can only propel one's career in the right direction. Today, computers are a part of almost every industry. They are no more limited to the software industry. They are widely used in networking, information access, data storage and the processing of information. So why not introduce computers early in education? Introducing computers early in education lays the foundation of most of the major competitive careers. Computers play a significant role in one's personal and professional life (Oak, 2008). Computer aided education has the advantage of easy teaching, better learning, free repetition and furthermore all sort of distance education.

In final, I defenced computer aided educations superiority again with supporting a case study. Ath. Kehagias and Pan. Vlachos has a research called Melon project for Melon foundation grant to their project, which is fulfilled in The American College of Thessaloniki. They choose American College students for their diverse educational backgrounds. They want to design courses, which will teach to the students basic mathematical knowledge (necessary for follow-up courses), They want to relevance them to mathematics. And they think to keep a fine balance between showing more technical (in which case students will be alienated) and too simple (in which case students will lose interests in the course). Then they organize a course which they can use computer in class. They used some software packages such as Microsoft Excel and Mathcad. At the end of the course they also find it computers did play a positive role, in "sweetening mathematics". And they have found that computer aided education students were better at it than traditional ones.

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