



T.C.
YEDITEPE UNIVERSITY
GRADUATE INSTITUTE OF SOCIAL SCIENCES

COMPUTER AIDED EDUCATION

by

Can Cemal CİNGİ

Submitted to the Graduate Institute of Social Sciences
In partial fulfillment of the requirements for the degree of
Master of Arts

ISTANBUL, 2010

Computer Aided Education

by

Can Cemal CİNGİ

Approved by:

Prof. Dr Emin Doğan AYDIN
(Supervisor)



Prof. Dr. Ahmet Lütfi ORKAN

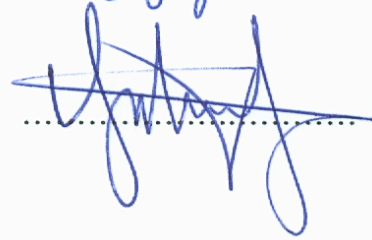


Prof. Dr. Melda CİNMAN ŞİMŞEK

Prof. Dr. Özhan TINGÖY



Assistant Prof. Cem SÜTÇÜ



Date of Approval by the Administrative Council of the Faculty 17/09/2010

TABLE OF CONTENT

LIST OF ABBREVIATIONS.....	v
LIST OF FIGURES	vi
LIST OF TABLES.....	viii
ACKNOWLEDGMENTS	ix
ABSTRACT	x
ÖZET	xi
1. INTRODUCTION	1
2. COMPUTER-AIDED EDUCATION	3
2.1 History of Computer Aided Education	5
2.2 Education	18
2.3 Types of Computer Aided Education	22
2.3.1 Autonomy	22
2.3.2 Model Creation	23
2.3.3 Demonstration.....	23
2.3.4 Game Model	23
2.3.5 Storytelling Model	27
2.3.6 Virtual Reality	28
2.3.6.1 Use of Virtual Reality in Training and Education	30
2.3.6.2 Virtual Reality as a Learning Environment	31
2.3.6.3 Augmented Reality and Enhanced Visualization	32
2.3.7 Animation	33
2.3.8 E-Journals	35
2.3.9 Online Meetings.....	37
2.3.10 User Created Content.....	38
2.3.11 E-Book.....	40
2.4 Distance Education	45
2.4.1 Online Education	47
2.4.2 Interactive Learning System	51

3. DESIGNING COMPUTER BASED EDUCATION MATERIALS	53
3.1 Text	54
3.2 Color	55
3.3 Illustrations	56
3.4 Sound	56
3.5 Video.....	56
3.6 Characteristic of the learner	57
4. ROLE OF COMPUTERS IN EDUCATION	58
5. ADVANTAGES OF COMPUTER AIDED EDUCATION	59
5.1 “False And Correct Addendum” Versus Correct Education Supplies.....	60
5.2 Education Material Update	61
5.3 Instruction Manuel.....	61
5.4 Decrease Of Labor	61
5.5 Chance Of Sharing Personal Experience Ideas And New Methods	62
5.6 Chance Of Searching In Seconds.....	62
5.7 Chances Of Asking Questions	62
6. COMPARISON OF COMPUTER AIDED EDUCATION VS. TRADITIONAL EDUCATION	63
7. CONCLUSION	77
REFERENCES	79
CURRICULUM VITAE OF THE AUTHOR	86

LIST OF ABBREVIATIONS

(CAE)	Computer Aided Education
(CAL)	Computer Asisted Learning
(MMOG)	Massively Multiplayer Online Games
(VR)	Virtual Reality
(AR)	Augmented Reality
(CAI)	Computer Aided Instruction
(ICT)	Information and Communication Technology
(VRLT)	Virtual Reality Learning Tool
(VRML)	Virtual Reality Modelling Language
(CDC)	Control Data Corporation
(PLATO)	Programmed Logic for Automated Teaching Operations
(RAMAC)	Randon Access Method of Accounting and Control
(RSS)	Really Simple Syndication
(CBMLE)	Computer Based Management Learning Environment

LIST OF FIGURES

Figure 2.1 Plato Student Terminal.....	5
Figure 2.2 A standard keyboard for a PLATO IV terminal, circa 1976.....	6
Figure 2.3 Using the CDC Plato network, circa 1979-1980, with an IST-II terminal.....	7
Figure 2.4 A PLATO V terminal.....	8
Figure 2.5 Univac Computer	10
Figure 2.6 The IBM Random Access memory machine	11
Figure 2.7 IBM Norc	12
Figure 2.8 Transistor-based	12
Figure 2.9 Slime forest kanji	24
Figure 2.10 Battle Screen.....	24
Figure 2.11 Screenshot from World of Warcraft.....	26
Figure 2.12 Using Virtual Reality in Education	30
Figure 2.13 Virtual Reality Learning Environment.....	31
Figure 2.14 E-Book	40
Figure 2.15 E-Book	41
Figure 2.16 E-Book	41
Figure 2.17 E-Book	42
Figure 2.18 E-Book	42
Figure 2.19 E-Book	43
Figure 2.20 E-Book	44
Figure 6.1 The Mathcad 7 Professional Workspace.....	67
Figure 6.2 Live Symbolics in Mathcad 7 Professional.....	68
Figure 6.3 Components in Mathcad 7 Professional.....	69
Figure 6.4 Screenshot from Mathcad 7 Professional.....	69

LIST OF TABLES

Table 2.1 Results of questionnaires 1	35
Table 2.2 Results of questionnaires 2	35
Table 6.1 Several interesting remarks (of a preliminary character) can be made regarding the results of the above table.....	73

ACKNOWLEDGMENTS

Initially, I would like to thank my supervisor Prof. Dr. Emin Dođan AYDIN who has graciously guided me to do this thesis. It was a pleasure to work with him.

I also would like to thank Prof. Dr. Ahmet Lutfi ORKAN, Prof. Dr. Melda CİNMAN ŞİMŞEK, Prof. Dr. Özhan TINGÖY and Assistant Prof. Cem SÜTÇÜ for their contributions. Their helpful, positive and sincere attitudes were fascinating.

I would also like to express my best regards to my family for their endless love and support.

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 thesis to emphasize roles of computer in education and to make a comparison of computer aided education vs. traditional education.

The computer technology has a deep impact on education. Computer education forms a part of the school and college curricula, as it is important for every individual today, to have the basic knowledge of computers. In computer aided education, for me the most important tool is “search engine” It is not comparable to search a topic in a 4 volume book and an electronic document. The search menu is the most important and fastest tool to reach the target. Another role, It will be more interesting and attractive to use a colorful software with animations or videos than reading a book especially I children. This module can help students deeply understand the content with diagrams, pictures and movie clips when needed. Beside that software’s are easy to carry, copy and distribute. Because of these advantages computer aided education expand day to day.

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. Differ from the computer-aided education, which is much easier to amend and update the material with an interesting and attractive use of colorful software with animations or videos. Besides that computer-aided education’s opportunity, which is not, involving traditional education system is forums. Forums are very helpful sites to share personal experience, ideas and new methods and you can find your answer. In short computer aided education offers more interactive possibilities than traditional education.

Keywords: Computer Aided Education, Computer Aided Education’s History , Computer Aided Education’s Advantages, Computer Aided Education’s Materials, Comparison between Computer Aided Education and Traditional education

ÖZET

Eğitim sektöründe bir çok yazılı materyal kullanılırken, araştırmalar görsel algının da eğitimde önemli bir yeri olduğunu göstermektedir. Bu bilgidan yola çıkarak, bilgisayarın da kullanımıyla yeni eğitim stratejileri geliştirilmiştir. Bu tezin amacı, eğitimde bilgisayarın rollerini vurgulamak ve geleneksel eğitimle bilgisayar destekli eğitimi karşılaştırmaktır.

Bilgisayar teknolojisinin gelişmesi, eğitim sektöründe derin bir etki yaratmıştır. Bilgisayar destekli eğitim okullarda müfredatın bir parçası haline gelmiştir. Bugün herkesin hayatında yer alan bilgisayar, insanlar için gittikçe vazgeçilmez bir kaynak olmaktadır. Bilgisayar destekli eğitimde bana göre en önemli araç arama motorlarıdır. Sonuca ulaşmada en hızlı ve en önemli araç olduğunu düşünüyorum. Bir diğer rolü ise renkli programlarla, resimlerle, videolarla ve animasyonlarla bir şeyler öğrenmek özellikle çocuklar için değişik ve ilgi çekici bir seçenektir. Bunun yanında bilgisayarda bilginin taşınabilmesi, kopyalanabilmesi ve dağıtılabilir olması da bilgisayar destekli eğitimin giderek yayılmasına yardımcı olmaktadır.

Bilgisayar destekli eğitim sistemi, geleneksel bilgisayarsız eğitime göre daha gelişmiş ve daha etkili bir eğitim sistemidir. Eskisi gibi bir çok kitap ve fotokopi gibi materyallerle öğrencileri sıkan ve anlaşılması karışık kitaplarla eğitim yerine bilgisayar destekli eğitim sayesinde bugün, daha kolay ve hızlı bir şekilde güncel kaynakların bulunabileceği ve değişik programlarla, videolarla, resimlerle daha ilgi çekici bir eğitim sistemi almaktadır. Öte yandan eski geleneksel sistemin olanak vermediği özelliklerden biri de merak ettiğinizi forumlar aracılığıyla sorabilir veya kişisel fikirlerinizi internette paylaşabilirsiniz. Kısacası bilgisayar destekli eğitim geleneksel eğitime göre daha interaktif olanaklar sağlamaktadır.

Anahtar Kelimeler: Bilgisayar Destekli Eğitim, Bilgisayar Destekli Eğitim'in Tarihi, Bilgisayar Destekli Eğitim'in Avatajları, Bilgisayar Destekli Eğitim'in Materyalleri Bilgisayar Destekli Eğitimle Geleneksel Eğitimin Karşılaştırma.

1. INTRODUCTION

Computer assisted learning (CAL) is not a new fact. 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.

The content of the thesis is as follows: The first chapter is introduction in which the aim of the thesis is described. History of computer-aided education and the types of computer aided education are explained in the second chapter. First generalized computer assisted instruction system, PLATO are explained with a detailed timeline in first before explained types of computer aided education like autonomy, model creation, demonstration, game model, storytelling model, virtual reality, E-Journals, online meetings, user created content and distance education. Third chapter is consists of designing materials for creating computer aided education. Text, colour, illustrations, sound, video, and characteristic of the learner explained in this chapter.

Fourth chapter includes roles of computers in education than in fifth chapter we emphasize advantages of computer-aided education. In Sixth chapter, computer aided education and traditional education is compared before conclusion part of the thesis.

Traditional teaching methods and course contents have all been affected by the introduction of computer technology. Therefore, two case studies are quoted in this thesis for showing importance of computer-aided education.

In first one in animation part, Chieko Matsuyama, Toyoshiro Nakashima and Naohio Ishii showed process of program creation. End of their questionnaire students felt that their animation creation skills, had improved enjoyed themselves and found the course

interesting although it was difficult to create animation using the program and to create a program.

Second used when two education types compared. 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 CAI students were better at it than traditional ones.

2. COMPUTER-AIDED EDUCATION

Today, the use of computers on information technologies becomes a doubtless part of daily routine. Another area of interest is using computers in education. The field of computer-aided education covers many different tasks and methods. Many universities and education organizations are planning their education strategies on computer-based technologies. As a result of the improvement in computer aided educations, new sort of education materials should be obtained or prepared for various fields of science. Since computers provide almost unlimited possibilities, these materials are only limited with the thinking capacity of mankind that may be accepted as unlimited.

Another goal of this education system is to develop the learning eagerness and increase capacity of students. Advanced computer based technology should ease the teaching and learning process.

It is impossible to expect the future of educational institutions with any accuracy. But it seems fairly clear that computers will not solve their problems. A gradual improvement in educational software should make computer-aided instruction a more useful educational tool than it is at present. The capacity of computer networks to support communication at a distance may be used to replace many teachers, through the development of centralized electronic instruction that resembles television studios more than traditional classrooms (McDonnell, Turner, 1984). Or computer-aided instruction may be used by students for information and practice and by teachers in their interactions with students. The outcome is not a technological issue. It depends on how we understand education and its purposes. As private sector education expands, bring the cultural transmission of knowledge more into the marketplace; we will have to make some political choices about how much we want education and socialization to remain public processes. (Perrolle)

L. Ushadevi mentioned in two abbreviations for differing old and modern education styles. According to his paper he use “3Rs” (Reading, writing and arithmetic) and “3Ms” (Man, Material and Methods) terms. Text said “3Rs” (Reading, writing and arithmetic) were to the Ancient Education. "3Ms" (Man, Material and Methods) are to modern education. Modern education differs from the ancient or old education not much only in subject content but also in emphasis and approach.

3M's “man” stands for that Bio psychophysical organism which is the center of all activity in the education. Psychologists have claimed that satisfying learning can not take place until and unless the nature of the child, who steps into the threshold of the school-the temple of learning-is fully understood by the teachers who are responsible for providing to him all those situations which make him unfold his basic potentialities and innate capacities, child centered education lays more stress on the understanding of the ways of life rather than passing on the bits of informatory knowledge. Material, invariably points to the subject matter, the syllabus, the content of the course etc, that capacitate the child to achieve a reasonable degree of mental and physical skills so as to earn a recognizable position in the society. The present day education has undergone radical changes so far as the "material" is concerned, simply because the scientific investigations and inquiries are revealing to us vast oceans of facts regarding the nature and working of the universe, and the knowledge is doubling itself in each decade. That is why the contents of courses of reading are being revised each academic year. Next, comes the "Method" the way by which the experiences, informatory material, the knowledge-abstract and factual-is transferred to the learners. The method adopted by the teacher in the transference of 'material' is as important as the other two factors. Teaching becomes a boring and burdensome process if the teacher has not been careful enough in selecting the method. Even the more interesting and valuable subject becomes a source of frustration for the students if it has been badly handled by the teacher. Hence, an attempt has been made in this paper to list out some of the electronic resources that are available, which aid in teaching and learning process in an efficient manner. (Ushadevi, 2001)

2.1 HISTORY OF COMPUTER AIDED EDUCATION

Computer assisted learning (CAL) is not a new fact. This field of education has been growing since the introduction of computers into the learning environment. Starting with the digital textbook, CAL has moved into the realm of creating learning environments, where the participant has the ability and necessary tools to produce their own learning paths and outcomes (Whalley, 1998).

First generalized computer assisted instruction system was the PLATO (Programmed Logic for Automated Teaching Operations) which was started in 1960s, comprised some 1,000 terminals worldwide. Originally, PLATO system was built by the University of Illinois and functioned for four decades, offering coursework to University of Illinois's students, local schools, and other universities.



Figure 2.1 Plato Student Terminal
(<http://www.uofaweb.ualberta.ca/educationhistory/images/PLATO-terminal.JPG>)

The PLATO project was pretended by the Control Data Corporation (CDC), who built the machines with which PLATO operated at the University. CDC President William Norris

planned to make PLATO a force in the computer world; the last production PLATO system was shut down in 2006 , yet it established key on-line concepts: forums, message boards, online testing, e-mail, chat rooms, picture languages, instant messaging, remote screen sharing, and multi-player games.

Chalmers Sherwin who is a physicist at the University of Illinois, suggested a computerized learning system to William Everett, the engineering college dean, who, in turn, recommended that Daniel Alpert, Physicist Daniel Alpert convene a meeting about the matter with engineers, administrators, mathematicians, and psychologists. After weeks of meetings they were unable to suggest a single-design system, yet, before conceding failure, Alpert mentioned the matter to laboratory assistant Donald Bitzer, who had been thinking about the problem, suggesting he could build a demonstration system.



Figure 2.2 A standard keyboard for a PLATO IV terminal, circa 1976.
(<http://en.wikipedia.org/wiki/File:PLATO4kb.jpg>)

Bitzer, regarded as the Father of PLATO, rejected modern educational thinking, and returned to a basic drill-based educational system. His team improved existing systems by allowing students to bypass lessons already learned. In 1960, the first system, PLATO I, operated on the local ILLIAC I computer. It included a television set for display and a

special keyboard for navigating the system's function menus; in 1961, PLATO II, featured two users at once. Convinced of the value of the project, the PLATO system was re-designed, between 1963 and 1969; PLATO III allowed "anyone" to design new lesson modules using their TUTOR programming language, conceived in 1967 by biology graduate student Paul Tenczar. Built on a CDC 1604, given to them by William Norris, PLATO III could simultaneously run up to 20 lessons, and was used by a local facility in Champaign-Urbana that could enter the system with their custom terminals.

PLATO I, II and III had been funded by small grants from a combined Army-Navy-Air Force funding pool, but by the time PLATO III was in operation everyone involved was convinced it was worthwhile to scale up the project. Accordingly, in 1967 the National Science Foundation granted the team steady funding, allowing Bitzer to set up the Computer-based Education Research Laboratory (CERL) at the university. (ReferenceAnswers).



Figure 2.3 Using the CDC Plato network, circa 1979-1980, with an IST-II terminal
(http://en.wikipedia.org/wiki/File:Plato_ist2_terminal.jpg)

In 1972 a new system named PLATO IV was ready for operation. The PLATO IV terminal was a major innovation. It included Bitzer's orange plasma display invention which incorporated both memory and bitmapped graphics into one display. This plasma display included fast vector line drawing capability and ran at 1260 baud, rendering 60 lines or 180

characters per second. The display was a 512x512 bitmap, with both character and vector plotting done by hardwired logic. Users could provide their own characters to support rudimentary bitmap graphics. Compressed air powered a piston-driven microfiche image selector that permitted colored images to be projected on the back of the screen under program control. The PLATO IV display also included a 16-by-16 grid infrared touch panel allowing students to answer questions by touching anywhere on the screen. (ReferenceAnswers). As is seen in figure 2.4 a PLATO V terminal 1981 displaying Rank Trek application, one of the first to combine simultaneous local microprocessor-based computing with remote mainframe computing. The monochromatic plasma display's characteristic orange glow is illustrated. Infrared sensors mounted around the display watch for a user's touch screen input.



Figure 2.4 A PLATO V terminal
(<http://en.wikipedia.org/wiki/File:Platovterm1981.jpg>)

It was also possible to connect the terminal to peripheral devices. One such peripheral was the Gooch Synthetic Woodwind (named after inventor Sherwin Gooch), a synthesizer that offered four-voice music synthesis to provide sound in PLATO courseware. This was later supplanted on the PLATO V terminal by the Gooch Cybernetic Synthesizer, which had 16 voices that could be

programmed individually or combined to make more complex sounds. This allowed for what today is known as multimedia experiences. A PLATO-compatible music language was developed for these synthesizers, as well as a compiler for the language, two music text editors, a filing system for music binaries, programs to play the music binaries in real time, and many debugging and compositional aids. A number of interactive compositional programs have also been written. (ReferenceAnswers)

Computer Assisted Learning can be defined as a computer program or file developed specifically for educational purposes. The technique used throughout the world in a variety of contexts, from pre and primary school aged children to train adults in medicine, law accounting, communication and language (Whalley, 1998: 55). However its use has not always been so widespread. In the 1980s, the first computer assisted learning became available to university students looking for an alternative to the traditional textbook. These programs used only digital files transferred onto a CDROM to give students portable and accessible learning materials. (Whalley, 1998)

Although there were many opponents just after the initiation of computer-based education, as time goes on, this method became more and more popular. The popularization of this form of learning and the increased ownership of personal computers led many scientific groups work on this field. It caused the development of widely distributed educational CDROMS such as Encarta. Roschelle et al, focused on this data at their publication in 2005. As technology continued to grow on this field, the most important invention of this century was occurred. Everybody should accept that the most important corner stone of computer history is the invention of Internet. It is over the imagination of many scientists working on this field. For sure with the introduction of the Internet, information on CAL programs became more interactive. This served the aim of reflection of the social need for flexible learning outcomes. Whalley reported this data as the multitude of Computer Assisted Learning platforms designed for every market, from school based edutainment packages to computer based management learning environments. (Whalley, 1998)

There is a detailed timeline below about the History of Computers, and the History of Computers in Education;

1780 - Early public schools adopt the teacher/manager model with the teacher as the primary manager of instruction and assessment in a single classroom.

1946 - First vacuum tube-based computers developed; universities help in computer development effort; technology used in war effort.

1951 - Little technology used in schools, primarily TV, baby boom begins with resulting increases in class size and first-generation Univac computer delivered to the US census bureau.



Figure 2.5 Univac Computer
(<http://masteroftheuniverse.files.wordpress.com/2009/01/univac-1-fullview-b.jpg>)

1954 - General Electric is the first business to order a computer. Early rock and roll music, based on the rhythm and blues tradition, gains a little in popularity.

1955 - IBM's first commercial computer RAMAC 305 (Random Access Method of Accounting and Control) is sold; the cold war results in use of technology in aircraft

design and in weapons control. Russia developing the technology for the first spacecraft. As shown below The IBM Random Access memory machine was announced in 1956. It was marketed as a business machine for accounting applications. The RAMAC used a disc storage unit (shown along back wall) capable of holding 5,000,000 units. It consisted of 50 magnetic metal disks arranged in a vertical stack, accessed by a read-write arm for high speed random access, online.

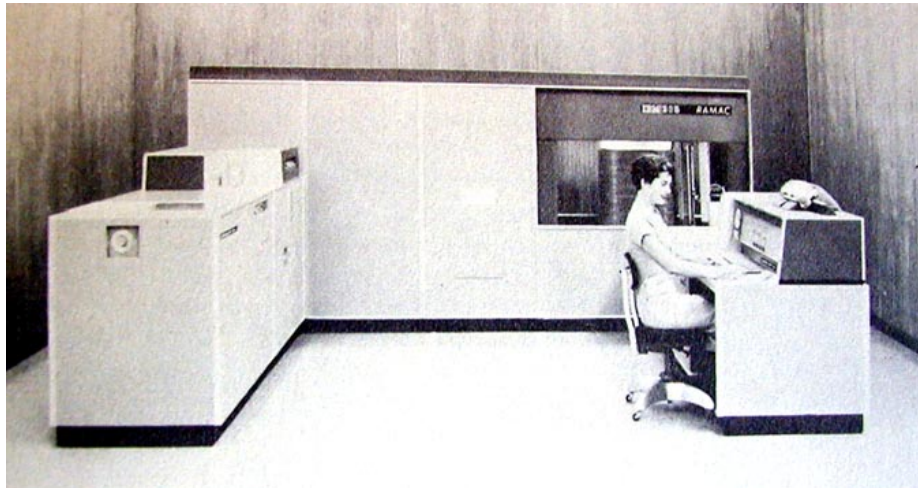


Figure 2.6 The IBM Random Access memory machine
(<http://www.computermuseum.li/Testpage/IBM-305-RAMAC-1956.htm>)

1956 - Eisenhower elected as president. Elvis Presley records "Hound Dog"; school overcrowding growing; school dropout rate rapidly declining toward zero; schools still based on the teacher/manager model in individual teacher-controlled classrooms; the cold war continues with technology playing an important role and is intensified when Russia sends up their Sputnik space vehicle to demonstrate their lead in technology.

1958 - As cold war continues, National Defense Education Act brings some new money and some new technology into schools, but primarily in vocational education. Mainframe host computers are not widely accepted in schools that are still using the single classroom, teacher/manager method of delivering information to students.

1959 - Transistor-based computers in use; the cold war continues with public support for the development of technology needed for space exploration.

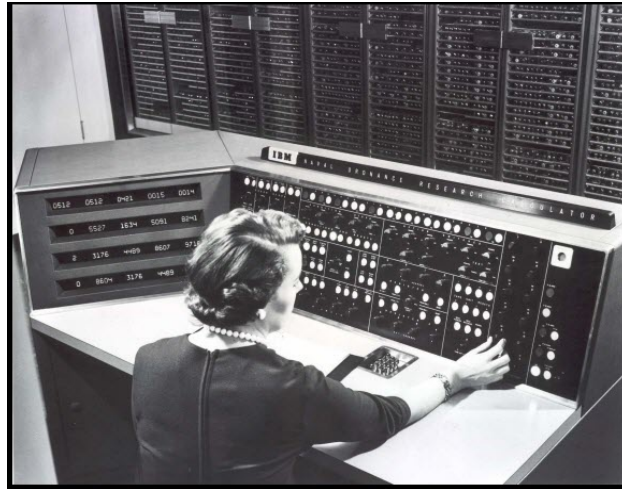


Figure 2.7 IBM Norc

(http://files.sharenator.com/4176601052_cd88d63a19_o_Retro_delight_Gallery_of_early_computers-s580x912-33933-580)

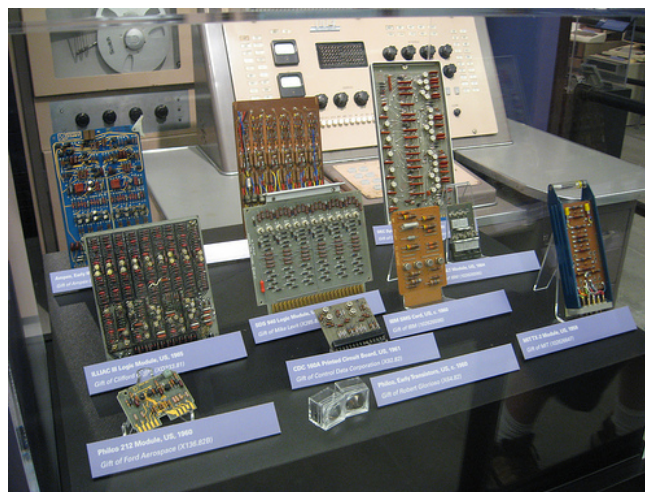


Figure 2.8 Transistor-based

(http://farm4.static.flickr.com/3361/3564958063_5ba18c8397)

1960 - COBOL business-oriented, high-level programming language created. Kennedy elected as president with campaign promises to put more money into education; crime rate doubles in one decade; Gary Powers shot down in hi-tech spy airplane; 70,000 involved in civil-rights sit-ins.

1962 - Airlines begin to use a computerized reservation system. President Kennedy diverts more money into education. The cold war continues and results in a confrontation with Russia as hi-tech spy planes discover missiles in Cuba; George Wallace campaigns for governor of Georgia pledging segregation forever.

1963 - Vocational Education Act passes with new money supporting the use of technology in schools. However, the mainframe and minicomputers in use at this time are using batch processing methods that do not fit well with the single teacher-as-manager-of-learning methods in use in most schools; BASIC, a simple high-level programming language is developed, mostly for use in universities to train programmers; IBM 360 family of computers is developed; most computers still using host methods with punched cards as the primary input device; line printers are still the primary output device; the cold war and the competitive space exploration effort continues with President Kennedy's call for the science to be developed that could put a man on the moon.

1964 - Johnson elected president; the Beatles rapidly rise to stardom. Bob Dylan writes songs that give voice to the protest movement; the Gulf of Tonkin incident results in the first confrontation between the US and the government of North Vietnam; the civil rights movement grows including a one-day civil-right protest absence of 464,000 students in New York; China explodes a test Atomic bomb.

1965 - Elementary and Secondary Education Act brings new money into schools for technology. Mainframes and minicomputers are put into place in some schools, but most are used for administration or for school counseling (databases for information about and for students); the cold war continues as President Johnson expands the war, with 125,000 American troops in Vietnam; ; hi-tech weapons are used in bombings of North Vietnam; 50,000 Americans killed in traffic accidents.

1967 - High-level programming languages such as Fortran are being taught in universities. School vocational training programs begin to include computer maintenance;

Stokely Carmichael declares a need for SNCC to move from civil rights to black power. Mohammed Ali refuses army induction for religious reasons bringing national attention to both the black power movement and the anti-Vietnam movement; student strikes on many campuses related to protest over both civil rights and the policy in Vietnam; acid rock and protest rock grow in popularity; centers of dissidence like Haight-Ashbury in San Francisco develop; anti-war protests grow, especially on college campuses; 380,000 US troops in Vietnam.

1968 - Nixon elected as president. Riots in many cities break out over civil rights issues. The cold war continues with a rapid expansion of the war in Vietnam 9,419 dead in Vietnam; some programs designed to bring money for technology into schools are canceled; host computers are not widely adopted in schools because they are seen as appropriate for use with the teacher/manager model of learning (they don't fit into the single classroom, but instead are accessed remotely by sending batches of data).

1969 - Neil Armstrong arrives on the moon. The Woodstock rock concert in upstate New York draws hundreds of thousands; the cold war and the war in Vietnam continue. Many students, religious leaders, civil rights leaders, and ordinary citizens begin to speak out against the war in Vietnam.

1970 - Pascal created; the US bombs Cambodia; Kent State antiwar students killed by Army reserve troops; mainframes and minicomputers in use in some schools but very little use in the delivery of instruction.

1971 - Intel's first microprocessor developed. The first microcomputers (PCs) are developed. Mainframes and minicomputers are in wide use in business and a few software companies begin to develop mainframe and minicomputer- based instructional programs; 18-year old given the vote.

1972 - Five men working for President Nixon's re-election caught in the Democratic party's headquarters in the Watergate hotel complex. Nixon re-elected president and orders the bombing of North Vietnam.

1974 - President Nixon resigns and is given a full pardon by his successor. President Ford creates a gasoline embargo lines at gas stations. Patty Hurst kidnapped. Hank Aaron breaks Babe Ruth's lifetime home run record. Apple I computer is sold in kit form.

1975 - Some Apple 1 PCs are donated to schools but some schools have adopted mainframes and minicomputers and refuse to consider PCs; four Nixon administration official convicted in Watergate cover up. The war in Vietnam ends and the government of North Vietnam invades and takes over South Vietnam.

1976 - Carter elected as president during the cold war continues. Iraq holds hostages, rampant inflation and the Apple I computer gains popularity in small business.

1979 - 15 Million PCs estimated to be in use worldwide. PC-based spreadsheets developed and mainframes, minicomputers still in wide use.

1980 - Reagon elected as a President. The cold war continues with Reagon declaring Russia to be the "evil empire". The TI 99, which uses a television screen as the monitor, is the world's most popular PC.

1981 - IBM is the first mainframe manufacturer to develop a PC. Drill and practice CAI gains acceptance in schools; the cold war continues. The first educational drill and practice programs are developed for personal computers.

1983 - IBM PC clones proliferate; Sperry Corporation is the second mainframe manufacturer to develop a PC (actually developed by Mitsubishi in Japan); the Apple II computer finds widespread acceptance in education because PCs better fit the teacher /manager model of instructional delivery (PCs can be used to "support" the ongoing teaching in the single classroom). Simple simulation programs are developed for personal computers.

1984 - Reagon re-elected; 31 states use 13,000 PCs for career guidance, but there are still relatively few computers in classrooms; the Apple Macintosh computer is developed. Commercial software manufacturers develop computer-based tutorials and learning games.

1986 - 25 % of high schools use PCs for college and career guidance, K-8 schools buying mostly Apple II and Macintosh computers, high schools buying mostly DOS-based clones.

1988 - Bush elected President; 60 % of all workers in the US use computers, laptops are developed; Gorbachoff proposes an end to the cold war.

1990 - Multimedia PCs are developed. Schools are using videodiscs; object-oriented multimedia authoring tools are in wide use; Simulations, educational databases and other types of CAI programs are being delivered on CD-ROM disks, many with animation and sound; the US crime increases dramatically; the cold war ends.

1992 - Clinton elected President; for the first time, police and prison budgets begin to surpass education budgets; schools are using Gopher servers to provide students with on-line information.

1994 - Digital video, virtual reality, and 3-D systems capture the attention of many, but fewer multimedia PCs than basic business PCs are sold; object-oriented authoring systems such as HyperCard, Hyper studio, and Author ware grow in popularity in schools; most US classrooms now have at least one PC available for instructional delivery, but not all teachers have access to a computer for instructional preparation.

1995 - The Internet and the world wide web began to catch on as businesses, schools, and individuals create web pages and most CAI is delivered on CD-ROM disks and is growing in popularity.

1996 - The Internet is widely discussed as businesses begin to provide services and advertising using web pages. New graphics and multimedia tools are developed for the delivery of information and instruction using the Internet; many schools are rewiring for Internet access; a few schools install web servers and provide faculty with a way to create instructional web pages.

1997-2007 - The growth of the Internet expands far faster than most predicted. It soon becomes the world's largest database of information, graphics, and streaming video making it an invaluable resource for educators; but marketing-oriented web pages, computer viruses hidden within downloadable programs and/or graphics, and spam (widely disseminated email-based sales pitches) threaten it's usefulness. Search engines such as Google and Yahoo constantly develop new ways to find information within the ever-growing number of web pages. Web sites that offer individuals a place to put personal information become popular, as does internet-based publishing and discussion forums. Voice recognition slowly enters the computing mainstream, but it's development is slowed by an unacceptable frequency of errors. Some computers incorporate TV input, but it is not as common as many predicted. Educational software becomes more useful and interesting to students as graphics and video are incorporated. Larger computer storage capacity and the growing prevalence of CD-ROM and DVD drives in personal computers make it easier for educators to store large graphic and video and sound files for educational applications. (California State University)

In this historic reforms initiated in the education system throughout the 1990s, combined with efforts to secure the pervasiveness of information technology (ICT) in the nation over the last decade, are starting to greatly impact the life of all people. Various details of these impacts are presented, including the ways in all educators are applying computer-assisted learning (CAL). (Kent, Son, 2004)

2.2 EDUCATION

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)

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.

Otherwise, education by stemming from stages of communication, learning, building behaviors, functionalizing skills, producing information and ideas, building technology and application, is the process of constructing a unique individual identity, which has a happy, successful, and healthy life. (Alkan, 1997)

Today, we are living in the age of informatics society. As the name implies, the core of this society is importance attributed to information. Although information has many different definitions, we prefer the one stating that information is the content of what is transmitted from a sender to a recipient. (Orkan, 1992)

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. (Kizil, Kerridge, Hancock)

There is an important field of industry related with teaching technologies. Every other day researchers are launching new materials for a better and quicker teaching.

Education encompasses both the teaching and learning of knowledge, proper conduct, and technical competency. It thus focuses on the cultivation of skills, trades or professions, as well as mental, moral & aesthetic development.

Bell and Fogler (1995) state that students learn best when a variety of teaching methods are used. They further state that different students respond better to different teaching methods. When used in conjunction with contemporary teaching techniques such as class discussions, group projects and problem-based learning, multimedia and virtual reality based techniques have the potential to revolutionise education in the mining industry. The use of these techniques in education is more attractive to students as they are flexible, attractive and easier to understand - especially in mining where it can be difficult to demonstrate complex underground mining methods through the use of two-dimensional diagrams. (Kizil M.S., Kerridge A.P., Hancock M.G.)

Starting with the invention of alphabet and writing a long history of education was taken place. After using tablets as writing media, papyrus and then paper the story of improvement of the education products started. But we all have to agree that the first corner stone of education is the invention of publishing. After having printed books, acceleration of education was very fast. The second corner stone of education is definitely the invention of computers. Computers are doubtless the most useful education tools. Their importance will increase with the widespread of their usage in near future.

Encyclopedia 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 Encyclopedia)

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

Various techniques were described and analyzed 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.

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 that is willingness to learn. Autonomy may be described as the willingness or self-determination of every individual to study and to learn.

A Chinese paper explained education theories. “Nowadays the major popular theories of education are Behaviorist Theory, Cognitive Theory, and Constructivist Theory. The behaviorists believe that environment shapes behavior. They are concerned with the changes in a student's behavior that occur as a result of learning. Behaviorist theory emerges in the form of operant conditioning, using reinforcement. Cognitive theorists are concerned with the changes in a student's understanding that result from learning. They believe that learning must be meaningful. Cognitive learning is based on schemata or mental structures by which students organize their perceived environment. Schematic structures of cognitive development change by the processes of assimilation and

accommodation. Assimilation is the process by which a learner integrates new information and experiences into existing schemata. Accommodation is the process of modifying existing schemata or of creating new schemata. Within these three educational theories, we focus primarily on Constructivist Theory, which is the academic basis of a WWW based collaborative learning system. We believe that "motivated learning" rather than "unmotivated learning", and a "collaborative environment" rather than an "isolated environment" are two main advantages that the Web has brought about". (Fang, Rao, SU, Li)

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.

Robert Gagne questioned the technology situation in his paper as: One of the major questions of educational technology is, "How can the 'things of learning' best be employed to promote learning? There must be some reasons why these "things" have come to be viewed as having advantages for student learning. Why should a projected picture, a taped message, a television program, or a computer program, be of value in providing 'instruction to students? Are there reasons to suppose that they do, sometimes, have advantages for learning that are greater than those provided by the lecture, the book, the chalkboard? (Gagne, 1974)

Another topic of education is the education of labor. Bitzer mentioned in his book that: Man has always striven to invent tools and machines to increase his productivity. While the industrial revolution has made material goods available to a large segment of the population, some service-oriented sectors of our economy still remain essentially labor intensive. One of these are, education, spends over 60 billion dollars a year in the United States without significantly increasing its productivity.

The needs for help in the educational field are clear. The cost of education has increased rapidly, but the number of students who must be considered nonfunctional in our modern

technological society has risen. Not only have the complexities of a modern society increased the demand for a better education, but they have also caused frequent retraining to meet the needs of rapidly changing job opportunities. (Bitzer)

New devices and methods have been developed and for sure there will be more development in near future.

Nowadays, distance education based on contemporary communication methods, including real time interaction, is a part of distance teaching and training at all levels of education, from primary school to university, for formal as well as non-formal education around the world. (Akbaş, 2006)

2.3 TYPES OF COMPUTER AIDED EDUCATION

2.3.1 Autonomy

All efforts are for an easier, effective, fast and not boring education system. All communication means are very crucial for education. Computer helps to learn by all senses. Combination of hearing, seeing and visual perceptions makes learning easier. It varies from the very elementary experiment for an elementary school student to a very complex training program of astronauts. But first thing should be development of autonomy or in other words self-control in computer-aided education. This should be the first step of this method. Actually it should be the goal of general educational. But usually it is not easy to achieve in our generation. We usually had a symbol of authority in front of us. It may be a teacher or one of the parents who forces or sometimes threaten us to study. This model of authority is sometimes helpful but sometimes disgusting. The individual's mood or feeling or desire to study is ruled out. The goal and advantage of computer-aided education is leaving the decisions to that individual, because it has the advantage to study when you really want to study instead of at a certain lesson schedule.

2.3.2. Model Creation

Model creation and teaching on that model is another goal of computer-aided education. Especially fields with extremely expensive devices such as airplanes or human beings which are more valuable than any other creatures. Flight simulators to train pilots on new aircraft types are the best sample of computer-aided education, because computers can reproduce the overall environment. This brings the importance of audio beside vision. Teaching the names and usage of all switches may not solve the panic problem in an emergency where as a simulation may exercise it virtually. It may not be difficult to teach any operation going smoothly, but it is almost impossible to train a pilot for an emergency drop, an astronaut for a weightless experience, or a surgeon for an aorta rupture.

2.3.3. Demonstration

Another goal of computer-aided education can be defined as demonstration, discussion and final learning. Demonstration for me is the most fantastic usage of computers. It provides us to convert ideas and dreams into reality although it is virtual. This brings the express new ideas and feelings into an understandable media. It is a real problem to define and teach an abstract subject or a not well defined concept verbally. Computers and virtual reality has great importance in defining ideas.

2.3.4 Game Model

Another attempts to use computers as a joyful or at least less boring education tool is game model. It is very well known that computer games are very popular and a large group of people at all ages. They are very keen on them. So the idea is designing a game that focused on teaching a certain subject. They will do the learning activity while playing the game. Game oriented learning is spectacular and will serve to all aims of computer aided education system. Its acceptability will be very high so it will be announced as a better tool of education. The best example is “slim forest”.



Figure 2.9 Slime forest kanji
(<http://cache.kotaku.com/assets/resources/2007/02/slimeforestkanji>)

Slime Forest is a game similar to a role playing game created to teach three sets of kana (Japanese characters). This is a summary of Slime Forest:

The game starts in a cave where the player is required to venture into the world outside to sell potatoes. The player will then be assigned, one by one, several sub-tasks and fight slime monsters in the forest to accomplish the tasks.



Figure 2.10 Battle Screen
(<http://lrnj.com/images/battlescreen.png>)

The game has two complete sets of hiragana and katakana, and 200 kanji, the Chinese characters. The aim of this game is to create a learning environment that provides a fun way of memorizing these characters, which are usually learned in a classroom via rote learning. In addition, players are also expected to learn some words borrowed from non-Chinese foreign languages, written in katakana. The instruction of the game is in English; therefore, this game aims at English speakers who wish to learn the Japanese language.

Basically, there are two types of activities: the world, and the battle in which the learning takes place. In the world map, the player's role of the game protagonist and explores different locations, such as the cave and the castle.

The player needs to gather information about various missions by talking to people in the game. In the forest, the player will get involved in battles to fight slime monsters by typing the Romanized pronunciation of a particular kana that appears on top of the monster. If it is answered correctly, the player gains a chance to attack. Actually, the ultimate goal of this project is to design a game for everyone, even for those who are not interested in learning Japanese. (Zaphiris, Zacharia, 2006)

We would like to examine the game and learning using the theoretical model of game play. Based on the definition of *paidea* and *ludus*, one can make learning Japanese a form of game by simply adding *ludus* rules; say, "Those who manage to write down 10 kanas the fastest win the game." In Slime Forest, users are more eager to learn the language because they have an interesting goal in mind: to kill the monsters, so they can progress in the game. However, adding *ludus* rules to a boring activity merely reduces the boredom. This form of game is not fun enough to engage learners for hours. What would have happened if the rules of "Who Wants to be a Millionaire" were reduced to answering the questions. (Zaphiris, Zacharia, 2006)

Despite the vast interest in video and computer games, the educational game market still has a long way to go. Many people have heard of Warcraft, a strategy game, and Halo, a

battlefield simulation game, but how many people have heard of Millie's Math House, a learning game? However, as Web 2.0 puts more power in the hands of mere mortals, teachers will start making better learning games than the commercial game producers.



Figure 2.11 Screenshot from World of Warcraft
(<http://www.zath.co.uk/wp-content/uploads/2008/09/wow-zath-sunwell-screenshot.jpg>)

These games will also take advantage of new technologies. For example, low-cost virtual reality gloves give middle school students the ability to play “Virtual Operation.” John Shaffer (2002) describes a variety of educational learning experiences that virtual reality could present to middle school, high school and even college students. Several renowned organizations have turned to educational games to attract young people to their disciplines or movements. The Nobel Foundation uses educational games on its website to teach different prize-winning concepts in the areas of chemistry, physics, medicine, literature, economics, and world peace. The Federation of American Scientists has created engaging games that ask players to discover Babylon as archaeologists and to fight off attacks as part of the human immune system. Instructors do not have to be game designers to incorporate existing educational games into their curriculum. (Delich, Kelly, McIntosh)

Interacting online within the same game environment, hundreds, if not thousands of people gather together to play in MMOGs (*Massively Multiplayer Online Games*). In Worlds of Warcraft, one popular game, players can choose roles as a human, elf, or other creature

that works with others to accomplish goals. In the future, students will choose whether they will play as red blood cells, white blood cells, viruses, or anti-viral drugs to learn how viruses affect the body, and how to stop them. Currently, gamers seek treasures to score points and gain levels in an MMOG called Ever quest. In the future, students will use MMOGs in an online environment depicting the historical period to seek answers to instructors' questions about World War II.

2.3.5 Storytelling Model

Storytelling is a traditional way of portraying real or fictitious events in words. Actually the main target seems to be entertainment, but in reality the main target is education in stories. Stories are usually sort of animating characters in order to teach with sampling models. It combines lived experiences, travels, emotions, ideas and any other imaginary additions to give the educative message. Of course story telling was much more popular, in times when computers, televisions and game consoles were not in our daily life. Flashbacks to ancient times or heros were very frequent in order to give samples of behaviors.

Tingöy et al. had a report at 4th International Symposium of Interactive Media Design on storytelling. They declared that:

Storytelling is often considered to be a crucial aspect of humanity. Human beings have a natural ability to use verbal. Storytelling is a means of expressing experiences, emotions and ideas in different forms of transfer and dating back to ancient times. Despite all the modern innovations, the attraction of the art of storytelling has not really been lost, particularly, in the field of education where it still carries a major importance. This method, which has become a developed tool in imparting ideas and skills with the aid of the mass media, has become significant in all areas of studies.(Tingöy, Güneşer, Öngün, Demirağ, Köroğlu, 2006)

In traditional social culture, stories weren't only a few people but to a large audience. The stories included heroic acts, and legends that united people. They expressed stories about today, yesterday and tomorrow and expressed realities powerfully and thus they explained how a person perceived the outside world. According to Riesman, from the era of Homeros to our present time, people who listen to these stories and people who live in similar places become one.

The youngest forms of storytelling were oral, combined with gesture and expression: words were spoken from one person to another in an effort to communicate a message or a feeling. Stories are also seen in the artwork scratched onto the walls of caves. With the invention of writing, stories were recorded, transcribed and shared over wide regions of the world, such that today, the medium most commonly-associated with storytelling is the novel. As human activities have become more refined and complex, visual stories have been presented in images carved into wood, ivory or stone, painted on canvas, recorded on film and stored electronically as digital images. By using this to individual learning styles, improving retention and method, educational subjects can be taught, aiding and recall and finally reaching nonverbal transferred and developed. Through mass media, learners. One of these delivery methods is known as story telling is being done in a variety of ways. No matter how we tell our stories, it is the content of the message conveyed through different channels and forms, which counts. (Tingöy, Güneşer, Öngün, Demirağ, Köroğlu, 2006)

So computers are very suitable for this education means named story telling.

2.3.6 Virtual Reality

Virtual reality has become more crucial term in these days. Virtual Reality's applications has been used in different fields. But in these day from these applications the most used one and it is used in education field.

Virtual reality (VR) is a term used to describe computer-generated virtual environments, which are the patient, can explore and interact with in real time. In this review, the use of Virtual Reality to construct ecologically valid tasks for use in neuropsychological assessment and rehabilitation is discussed with particular reference to the measurement of prospective memory (PM) abilities. PM, the ability to act upon delayed intentions, is an example of an everyday ability requiring the coordination of a different cognitive processes that is ideally suited to research and rehabilitation using VR. Studies investigating PM and related abilities in patients with brain impairments are surveyed, and it is established that there is evidence for the utility of applying VR procedures to measure prospective remembering. Future research could usefully focus on the construction of a standardized testing procedure with credible psychometric characteristics. In particular, there needs to be evidence for the criterion validity of such tests. Another potential research avenue is the evaluation of VR platforms as tools to teach memory skills and awareness of impairments. It is concluded that difficulties in adapting programs to specific clinical needs, technical issues, and the reluctance of many clinicians to use computer-based technology need to be overcome before VR is likely to be widely used to measure PM. (Knight, Titov)

New technology obviously needs thoughtful introduction into classrooms. Technology does not, by itself, improve education, and even the most promising educational innovation needs skillful application to be effective. But, there is clearly the potential that VR learning environments can be powerful educational experiences. (Jonassen, 1990)

The significance of VR to education may be wider than particular learning applications. VR provides a testbed for exploring the very foundations of education. What we teach our children springs from our assumptions about how the world works and what is valuable. Our methods of teaching are based on our understanding of the role of the mind in learning. Educators are re-examining the philosophical foundations of education (Goodman 1984) by comparing the implications of Objectivism to those of Constructivism:

Objectivism and Constructivism represent alternative conceptions of learning and thinking. Objectivism assumes that the role of mental activities is to represent the real world and that the role of education is to help students learn about the world and replicate its content and structure in their thinking. But Constructivism, on the other hand, claims that we construct our own reality through interpreting perceptual experiences...that reality is in the mind of the knower rather than in the object of our knowing. Constructivists, rather than prescribing learning outcomes, focus on tools and environments for helping learners interpret the multiple perspectives of the world in creating their own. By making VR tools and environments available to educators, we may discover more about the very process of learning. By participating in the development of VR, educators can guide the growth of the technology, and perhaps influence the course of educational change. As we test and refine this unique learning environment together, we might even hope that VR really will help us to teach more effectively, and that we will see more often that bright light of understanding in our students eyes. (Jonassen, 1990)

2.3.6.1 Use of Virtual Reality in Training and Education

Virtual reality (VR) is the most advanced learning technology, is an innovative new way to teach and engage students. It allows students to step through the computer screen into 3-D and interactive worlds.



Figure 2.12 Using Virtual Reality in Education
(<http://www.vrcim.wsu.edu/images/slideshow/01.jpg>)

By putting on a special headset and glove, students can enter a world of educational adventure. And they can learn easily and funny way. (Sunrisevr, 2009)

2.3.6.2 Virtual Reality as a Learning Environment

Three-dimensional models allow students to step away from the two-dimensional character of conventional diagrams, and start visualizing scientific phenomena as they might appear in the “real world.” Furthermore, if the three-dimensional model could be made interactive, students could explore the model from any perspective in 3-D space, creating the basis for a Virtual Reality Learning Environment.



Figure 2.13 Virtual Reality Learning Environment
(<http://www.vrcim.wsu.edu/>)

The Virtual Reality Learning Environment may be beneficial to all grade levels--grade school through graduate school. The variable would certainly be the difficulty and detail of the activities relating to the virtual reality VRML scene. In addition, scientists may find the virtual reality environment of VRML to be a quick, and effective way to visualize numerical model data on the desktop, or over the Internet.

2.3.6.3 Augmented Reality and Enhanced Visualization

Augmented reality (AR) is an evolution of the concept of virtual reality. It is a hybrid environment, which is a combination of a physical environment with virtual elements added by computer input. This computer input augments the scene with additional information. While virtual reality strives for a totally immersive environment, an augmented reality system maintains a sense of presence in the physical world. Augmented reality's goal is to blur both worlds so the end user doesn't detect the differences between the two.

Augmented reality may use some of the following technologies:

Display technologies:

- high-definition, wall-sized display screens
- three-dimensional displays
- handheld mini-projectors
- glasses-mounted, near-to-eye displays
- flexible, paper-like displays
- full-face virtual-reality (3D) helmets

Multi-sensory inputs and outputs (Stead, Sharpe, Anderson, Cych & Philpott, 2006):

- speech
- smell
- movements, gestures, and emotional states
- tangible user interfaces using the direct manipulation of physical objects
- handheld PCs for user input and data
- GPS (global positioning system) units
- wearable sensors

Examples of augmented reality applications include:

- image-guided surgery in medicine
- movie and television special effects
- airplane cockpit training

- computer-generated images for engineering design
- simulation of major manufacturing environments

Augmented reality is most often used to generate complex, immersive simulations. Simulations are powerful learning tools that provide a safe environment for learners to practice skills and conduct experiments.

Integrating the physical world and computer input is obviously an expensive technical challenge, and it is mainly a research field at this time. Up to now, the potential training applications are limited to medical, military, and flight training; but as costs come down, the possibilities for simulations in all fields are limited only by the imagination.

2.3.7 Animation

Traditional teaching methods and course contents have all been affected by the introduction of computer technology. The challenge is to develop and use modern learning environments in education. In this development, visuality had been more important for easier and memorable learning method. Especially it helps both teaching and understanding skills in complex contents.

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 figures and pictures. Videos followed that. Recently education centers started preparing animations in both teaching and practicing. Many authors focused this topic.

Aydın (2005) stated that:

“For example, in medicine, training will improve by operating on virtual argons, and training for pilots will benefit VR training materials that will enable the user to saw or drill wood and build a project before attempting to use the real equipment.”

Fallman (2000) implied the same subject as:

“Learning consists of acquisition of information that is provided by the, in this case, virtual environment. Training, on the other hand, involves mainly responses from the user on the environment itself. Training arises from actions carried out by the user on the environment, while learning results from contextual.”

According to Chieko Matsuyama's, Toyoshiro Nakashima's and Naohiro Ishii's questionnaire, they investigated in form during the last lesson whether animation creation as a subject was something the students could tackle with interest in this course, and whether the 40 students had understood the process of program creation etc. The results are shown in Table 2.1 and Table 2.2. Students who answered that enjoyed creating animation amounted to 82.5%, the percentage of students with a negative attitude towards creation of animation was 0%, the percentage of students who said that their level of animation creation skill improved was 65%, the percentage of students who said that their level of animation creation skill had not improved was 5%, the percentage of students who answered that animation creation was difficult was 90%, and percentage of students who said that animation creation was not difficult was 2.5%. Moreover, the percentage of students who answered, "became more interested in programming" was 70%, and the percentage of students who gave a negative answer was 0%. (Matsuyama, Nakashima, Ishii)

Thus, as for most students, it turns out that they felt that their animation creation skills, had improved enjoyed themselves and found the course interesting although it was difficult to create animation using the program and to create a program. Moreover, from Table 6, regarding programming, 57.5% of students were able to understand what “programming” is, and 82.5% of students had understood the programming process. (Matsuyama, Nakashima, Ishii)

Table 2.1 Results of questionnaires 1

Choice Item	Yes	Neither	No	No answer
Have you enjoyed creating graphics (creation of animation)?	82.5%	17.5%	0.0%	---
Do you think that you acquired the ability to subject of your own choice using graphics?	65.0%	30.0%	5.0%	---
Do you think the creation of graphics was difficult?	90.0%	5.0%	2.5%	2.5%
Have you become more interested in programming?	70.0%	30.0%	0.0%	---

Table 2.2 Results of questionnaires 2

Choice Item	5 Yes	4 Yes, so much	3 Neither	2 Not so much	1 No	No answer
Q1	30.0%	27.5%	30.0%	7.5%	5.0%	---
Q2	37.5%	45.0%	15.0%	0.0%	0.0%	2.5%

2.3.8 E-Journals

E-Journal is a journal in an electronic format. These are available on the internet. You can reach through subscription databases. There are also some which are available through open access on the internet. It's a little bit different from other models, because this model for individual learning. (Glendale Community College)

E-journals has better advantages;

- Accessibility of the E-journals is easy than printed journals.
- Though authenticity is one of the criticisms when the 'open sources', E-journals are considered as one of the authentic sources of information.

- Lot of E-journals is available in an electronic form, which made available through open sources and consortium.
- Digital information has an attribute of manifestation. E-journals are considered as useful resources.

V. Chandrakumar's had research to seek study the e-journals use and utilization of the research scholars of the University of Madras. He found 250 people for questionnaire. Questionnaires have been distributed with equal proportion based on the number of departments available in that campus. According to his case study in research summary,

- ***Computer Education:*** Two third of the respondents are having formal computer education.
- ***Computer Use:*** Almost all the researchers are using computer one or other purposes.
- ***Purpose of using Computer:*** The research scholars are using computer for preparing assignment, project, research and some extend to entertainment rather business purpose.
- ***Internet and World Wide Web:*** Almost all the respondents are aware of Internet and World Wide Web and one third of them having good experiences in using Internet and World Wide Web.
- ***The research scholars*** are not only depending upon the University's Internet Centre's but also Cyber cafes. Only minimum number are using in their home.
- ***Internet use Learning:*** The researchers are learnt Internet browsing by themselves and through friends. This indicates that the syllabus does not have any course on Internet study area. (Chandrakumar)

- E-journals are using by the research scholars of the University. Among the researchers, Science discipline researchers are using open sources as well as consortia.
- Generally the E-journals are useful sources of scholarly communication
- Both the opinions are found that E-journals are considered as substitution to the print journals and not.

Also V. Chandrakumar pointed Internet Access Difficulties in his research

Language Barriers: Language is not at all considered as barriers in Internet access

Broken Links: Broken / dead link problem affect the researchers in the moderate level.

Instability of Network: The instability of network also not affects the use of Internet.

Slow Expansion of site: Researchers opined that it is in moderate level.

Relevant Information: The research scholars are found relevant information while searching the Internet.

Information overload: The same opinions of the above could find this case also.
(Chandrakumar)

2.3.9 Online Meetings

Synchronous meetings of online classes can be facilitated by the use of web conferencing/virtual classroom tools such as WebEx, Wimba, Elluminate, Skype, Microsoft Live Meeting, Adobe Breeze, Centra, and Interwise. These technologies add presentation and group interaction tools. Most of them provide both voice and text chat functionality. Their synchronous nature appeals to many people and complements other

asynchronous activities. Huge savings in travel costs can be realized by conducting meetings over the Internet. For a geographically widespread class or working group, occasional online meetings can help to keep people on track and provide a valuable opportunity for synchronous discussions. (Delich, Kelly, McIntosh)

2.3.10 User Created Content

Learners will not only have the opportunity to add value to structured courses through the use of emerging technologies such as Personal Broadcasting; many of them will create their own content which can be massaged and developed through group participation. Ordinary people will become creators and producers. Learners will truly begin to take control. Examples can be seen at the web- site called Wifi Cafés, where Internet users can add the locations of their favourite Internet cafe to an open list, and Current TV, where people—mostly non-professionals—create television segments and shows. Similarly, students, parents, teachers, and others will continue to create and disseminate educational content on a large scale. Instructors will require students to create content to share with their peers.

Personal broadcasting tools include: blogs (web logs), moblogs (mobile blogs), vlogs (video blogs), podcasts, vodcasts (video podcasts), and RSS (really simple syndication) feeds with uploaded images from cell phones. Instructors can use these technologies to bring diverse elements into a course to assist in meeting a variety of learning styles. These technologies can also be used for updating students on current activities and projects.

Podcasting and videoblogs can assist learners whose learning style is primarily auditory. Some uses include recording lectures for students to review, providing more clarity for difficult concepts, and supplementing lecture information such as, for example, guest lectures and interviews.

RSS feeds allow students to selectively download up- dates from targeted sources, personalizing the information and news they want to receive. Tools such as Suprglu allow

multiple RSS feeds on one Web page. Stead, Sharpe, Anderson, Cych & Philpott (2006) suggest the following learning ideas for Suprglu:

- Aggregate all of a student's production in one page.
- Bring a range of different search feeds together for easy viewing.
- Create a class site that aggregates whatever content feeds you are providing for students.
- Create a collaborative project site.
- Bring teacher lesson plans or ideas together on one page.

Personal broadcasting technologies give students an opportunity to participate in the creative construction of knowledge and project-related work. People can share their broadcasts on their own websites or through sites that specialize in specific types of broadcasting, such as wordpress.com for blogs or youtube.com for vlogs. YouTube's tagline captures the essence of personal broadcasting: "Broadcast Yourself." (Delich, Kelly, McIntosh)

Wikis are a type of website that allows visitors to easily add, remove, and otherwise edit the content. This ease of interaction makes wikis an effective tool for collaborative authoring. For example, Wikipedia has become a primary reference tool for many students, though by the readily editable nature of its information, it cannot be considered authoritative. Wikis can be useful as a tool for students to build their own knowledge base on specific topics and for sharing, comparing, and consolidating that knowledge. (Delich, Kelly, McIntosh)

User-created content provides a challenge, in that it will be difficult to verify the accuracy of each educational resource. Educators often comment that Wikipedia, while very useful, is made by experts and non-experts alike, potentially decreasing its credibility. While research conducted by *Nature* magazine determined that Wikipedia comes close to the *Encyclopedia Britannica* in terms of accuracy of science entries (Giles, 2005), it also shows that collaborative approaches to knowledge sharing require facilitation and editing. No matter what print-based or online source students use to substantiate their course work,

they should use multiple sources to check the validity, reliability, and potential bias of information.

To counter this problem, educators will adopt a practice used by eBay and other commercial websites (see the description of similar rating systems in Intelligent Searching above). Namely, people can rate individual pieces of educational content. Users who share educational content will have a dynamic profile that changes each time someone rates their contributions. For example, someone with high ratings would have the title of “trusted content provider”. Experts would have an equal opportunity to check the accuracy of user-created content.

2.3.11 E-Books

Habertürk newspaper made an investigation about the use of e books and its possible effects to readers, writers and publishers. It is very interesting that there are many different ideas about this new e book technology. While some has great expectations, some have opponets.

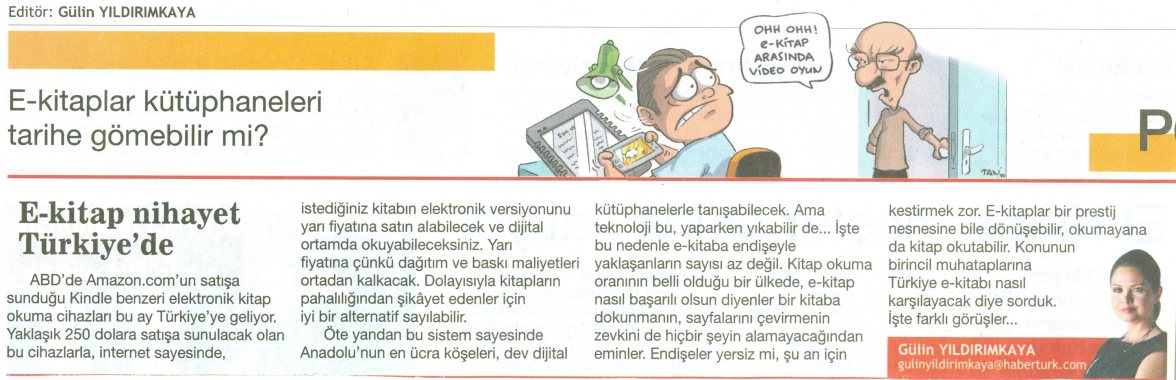


Figure 2.14 E-Book
(Habertürk , February.1.2010)

The director of Kitap Kurdu website Sadi Kizir reported that e books will replace the printed books. He added that we are the witnesses of the switching from records to Cd s , then from CD s to mp3 players. It is obvious that electronic bookss will be used very widely soon. As the launching of I Pad, these instruments will be more and more popular.

He also noted that this type of books will serve for protection of the environment. Because they do not need any paper.

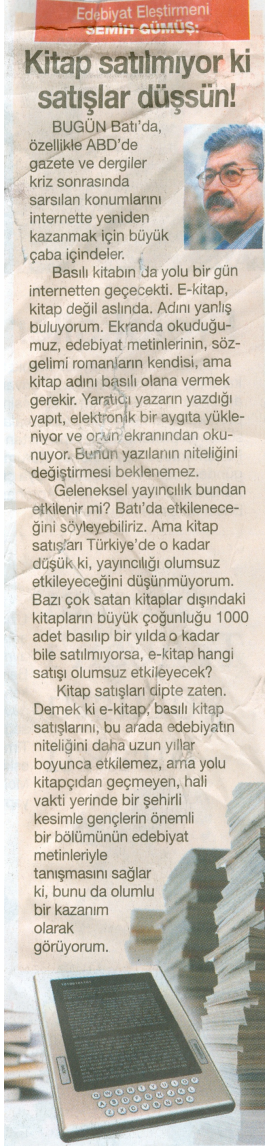


Figure 2.15 E-Book
(Habertürk , February.1.2010)

Similarly Özükan reported that E-books are very important education instruments. But many people who are against new technologies are against these new improvements. But even some publishers like Bülent Özükan advised us to use e books especially on travels. Another advantage of these e books are the possibility of changing the size and font of the letters. It gives the advantage of reading at optimum comfort.



Figure 2.16 E-Book
(Habertürk , February.1.2010)



Some writers are afraid of e books to be a new option of books that will decrease book sells. The main concern of book publishers is the negative effect of these instruments to published books. He wrote that this is not a big deal because books are not selling in huge numbers anymore. So he did not accept e-books as an important rival.



Figure 2.17 - 2.18 E-Book
(Habertürk , February.1.2010)

Another important advantage of e books is the ease of copying it. This will be another reason of their selling less in number. Because e books can be copied and shared easily. Furthermore it is easy to share it on Internet.

A famous Turkish writer is against all these ideas. She told that books will not be replaced by e-books. He added that she can not read any thing on a screen for more than 20 minutes but she can read a book for many hours. I don't agree with her on this idea. I believe that new generations are much more close to computers. So they will not think like she does

about e books. Another important advantage of e books is to search a special word. It will help for finding the data that the reader is looking for in a short period of time.

E-kitap arı kovanına çomak sokacak, yazarlar rahatsız

Kitap korsanlarının durdurulamadığı bir ortamda elektronik kitabın sonuçlarını tahmin etmek çok güç

Remzi Kitabevi Yayın Koordinatörü **ÖNER CİRAVOĞLU:**

KİNDLE kullanımları günden güne artıyor. Şimdi de ülkemize geliyor. Geliyor ama kaygılarımızı da görmezden gelemeyiz. Okurlarımız genel olarak basılı sayfaları belleğine naksetmeye alışık. Bu gibi ürünlerde görsellik özellikle edebiyat alanında hazza gölgeleyen bir durum olarak

karşımıza çıkacaktır. Kitap sayfası sinema perdesine, müzik parçasına benzemez.

Yurtdışındaki kimi yazarların, bu gelişmeden rahatsız olduğu biliniyor. Telif haklarının gereğince korunamadığı gerekçesiyle karşı çıkıyorlar.

Kitap korsanlarının durdurulamadığı bir ortamda

elektronik kitaba girmek bir yerde arı kovanına çomak sokmak değil mi?

Kütüphanelerin de işlevselliğini yitireceği belirtiliyor, sanki bizde kütüphaneler dolup taşıyor. Remzi Kitabevi olarak şu anda doğrudan bir e-kitap hazırlığımız yok. Bekleyelim ve görelim diyorum...

Yazar **PINAR KÜR:**

Basılı kitabın değeri hiçbir şeye değişilmez

BUGÜN elimde Amerikalı yazar J.D. Salinger'ın, 15 yaşımdan kalma, paramparça olmuş bir kitabı vardı. Gençliğimde taptığım bu yazarın öldüğünü öğrendiğimde, kabı yırtılmış olduğu, yani elimde parçalandığı için, bir zarf içinde sakladığım kitabını

çıkdım ve uzun uzun kokladım. Yazar olmamda etkili olan altmışlı yıllara döndüm. Kâğıda basılmış, elle tutulan kitabın değeri hiçbir şeye değişilmez. Okumasını bilen kişi başka hiçbir şeyle tatmin olmaz. Okuma alışkanlığı olmayan ülkemizde e-kitabın

hiçbir şekilde başarı kazanacağını sanmıyorum. Aygıtlara yüklenecek olan dijital kitaplar çok kişi tarafından okunabilir, basılı kitaplarda da böyle. Ama asıl sorun korsan. Müzikte, sinemada, edebiyatta halen korsanla mücadele edilemezken, dijital

versiyonuyla nasıl mücadele edecekler? Ben yarım saatten fazla bilgisayar başında kaldığım zaman gözlerim şişiyor. Halbuki elime bir kitap alıp saatlerce okuyabilirim. Böyle teknik boyutu da var...



Figure 2.19 E-Book
(Habertürk , February.1.2010)

Another issue is copyright of the books. The easy copying of the book will decrease the author's income. But publishing companies should solve it. Another issue is the lack of publishing and paper cost of e books. This will bring an advantage to readers. Copy-paste feature of this type of data is another major advantage for the reader but a disadvantage for the writer and publisher.

E-kitap yazarın değerini ve okuyucu sayısını artıracak

Sabah Gazetesi Teknoloji Yazarı **TİMUR SIRT:**

İnsanlar uygun fiyatlarla kolay yoldan kitap satın alabilecek. Devlet de ders kitaplarını bu şekilde dağıtabilir. Yayınevi ve yazar için büyük fırsat

İNTERNET geldi diye gazeteler, televizyonlar unutulmadığı gibi, e- kitap gelince yayınevleri de ortadan kalkacak değil.

E-kitap, yayınevlerinin kitaplarını dağıtmaları için yepyeni bir kanal olacak. Bunu tehdit olarak algılayanlar sadece orada kalacaklar.

Fırsat olarak düşünenler ise kazanacak. İnsanların kitaplara internet üzerinden ulaşması, daha çok kişi tarafından paylaşılması kolay olacak; baskı, kâğıt maliyetlerini, dağıtım maliyetlerini



ortadan kaldıracak; yatırım yapmak için daha çok fırsat oluşacak. Yazarın değeri ortaya çıkacak. Burada yayının kalitesini ortaya çıkarmak için de fırsat var. İnsanların uygun fiyatlarla kitap satın almaları okur sayısını da olumlu etkileyebilir.

Sadece kitap olarak bakmamak lazım, devletin ders kitaplarını bu şekilde dağıtması gibi bir durum da var. Ucuz bilgisayar kampanyalarıyla birleştiren örnekler de var. Kitapları böyle dağıtan kurumlar da var dışarıda.



Figure 2.20 E-Book
(Habertürk , February.1.2010)

School books will be distributed as e books in near future. Another important advantage of this system will be the possibility off upgrading the previous version by the new one. If it will be observed that there is an unclear subject or need to add or upgrade new information, it will take minutes to upload the new version.

This system will also create new writers. Or in other words will give the chance of publishing their studies easier. In order to print a book now, one has to convince the publishing company that that book will be sold in a certain amount. And some writers did not have any chance to publish or to share their work with anybody. By the use of Internet many people started sharing their printed materials by blog sites. This will bring the possibility of publishing books faster and easier for everybody.

2.4 DISTANCE EDUCATION

Distance education is a distinguished way of education for the learners who are physically away from the teachers. Saritas described it as;

Distance education is systematic guiding of distance teaching procedure, namely it is an education system in which students, teachers come together in groups, classes or seminars as in face to face education implemented by a teacher. (Saritas, 2007)

Although its history goes back 17th and 18th century, for me distance education started with computer-aided education. Computer aided education is a very convenient media for distance education.

Seferoglu pointed out that for teaching and learning activities does not necessarily need teacher and student to be physically together in closed place. (Seferoğlu, 2006) I agree with the author if only computer-aided materials perform education.

Distance education systems in west have arisen as alternative for traditional education systems. The most important characteristics of the distance education connections which superseded the Home Schools arose itself in USA and therein many family educate their children themselves, is intensive use of online programs. For example: the education given by Willowey Cyber School in North America to the young home school students for 2250 dollar annual fee. State schools in USA also implement the distance education system.(Aydın, 2006)

Nazlı Uçarı hypothesizes the basics of distance education are as follows:

- It can be accomplished without organized teaching, teacher or instructor. Intrinsic motivation is among the most important conditions of learning. When topics are made suitable to cognitive structure of the learners, learning is supported.

- The behavior during working situations and sincerity in human relations help to emotional participation. Emotional participation to work support achievement and deep learning.
- The feeling of friendly relations with instructors, consultants and supporting organization usually support and reinforce both working pleasure and motivation. Mental pleasure provides deep learning; enables using of problem-oriented working processes and achievement to targets.
- Participations are realized with taking responsibility for achieving objects; working plans which encourages personal decisions to learn; and taking targets into consideration.
- Learning is supported due to supplementary communication, which makes others curious during frequent working.
- Maturity creates motivational balance, willingness to overcome basic difficulties, which do not correspond with desires or tendencies but more with probabilities and ability to become independent. (Uçarı, 2008)

The unique sample of distance education is Anadolu University distance education program. It is a very well organized and should be accepted one of the best. They have high school programs beside license and pre-license programs. The most popular one may be the upgrade program from pre-license to license.

For distance education Manali Oak said that

“Online education has revolutionized the education industry. The computer technology has made the dream of distance learning, a reality. Education is no more limited to classrooms. It has reached far and wide thanks to the computer technology. Physically distant locations have come close to each other only due to computer networking.”(Oak, 2008)

They use all sorts of computer aided education facilities.

2.4.1 ONLINE EDUCATION

Definitions are not very clear on online education. Virtual education, internet- based education, web-based education, and education via computer-mediated communication is all under umbrella of distance education. These terms are all interfere with each other and as they also involved in distance education.

Morten Flate Paulsen listed the characteristics of online education:

- The separation of teachers and learners which distinguishes it from face-to-face Education
- The influence of an educational organization which distinguishes it from self-study and private tutoring
- The use of a computer network to present or distribute some educational content
- The provision of two-way communication via a computer network so that students may benefit from communication with each other, teachers, and staff

As the capacity of the Internet evolves and expands, the potential for online teaching and learning also develops and expands. The increasing number of new technology tools and expanding bandwidth are changing all facets of online activity, including e learning. As technologies become more sophisticated and as they begin to converge (for example, cell phones becoming multimedia-capable and Internet-connected), educators will have more options for creating innovative practices in education. (Delich, Kelly, McIntosh)

The shift occurring in the Web from a static content environment where end users are the recipients of information—defined as Web 1.0—to one where they are active content creators—defined as Web 2.0—can be described as a transition to a more distributed, participatory, and collaborative environment, Web 2.0 is considered to be a platform where “knowledge-working is no longer thought of as the gathering and accumulation of facts, but rather, the riding of waves in a dynamic environment” (Downes, 2005). Web 2.0 is defined not only by technologies such as blogs, wikis, podcasts, vodcasts, RSS feeds, and

Google Maps, but also by the social networking that it enables. As these communication-enabling technologies conjoin text, voice, and video using CoIP (communications over Internet protocol), they will provide a seamless integration with cell phones, personal digital assistants (PDAs), and computers (Yarlagadda, 2005). Web 2.0 technologies can bring people together in ways Web 1.0 did not. (Delich, Kelly, McIntosh)

At the beginning of this technologic change, several definitions often encompass a new concept. This is also true with. In an interview with Ryan Singel about Web 2.0 in 2005, Ross Mayfield, CEO of a company that creates wiki software, offered this simple definition: “Web 1.0 was commerce. Web 2.0 is people” (Singel, 2005, para. 6). Tim O’Reilly, who wrote one of the seminal articles on Web 2.0, saw it as an “architecture of participation”. (O’Reilly, 2005) and “not something new, but rather a fuller realization of the true potential of the web platform” (para. 88). Web 2.0 is centered on communication—the ability to interconnect with content, ideas, and with those who create them. Social networking is a key phrase for Web 2.0. The Web 2.0 framework sets the stage for a student-centered collaborative learning environment. Using existing communication tools in a way that encourages collaboration can be a step in the direction of incorporating the spirit of Web 2.0 philosophies in online learning environments. (Delich, Kelly, McIntosh)

A parallel can be drawn between the shift from Web 1.0 to Web 2.0 and the shift many instructors are making in online learning from an instructor-centered (Web 1.0) approach to a student-centered (Web 2.0) approach where students have more control over their learning. The effects of Web 2.0 may influence how online courses are conceptualized, developed, and taught. The use of Web 2.0 technologies and philosophies in education and training are sometimes referred to as “e-learning 2.0” (Cross, 2005; Downes, 2005; Wilson, 2005)

Currently, Web 2.0 technologies are just beginning to affect online teaching and learning. As the Web becomes more interactive, instructors will want to incorporate these technologies effectively. It is likely that Web 2.0

technologies will affect student-to-student communications in project-based learning, as it will affect ways in which instructors conceptualize, develop, and teach their courses. Incorporating Web 2.0 technologies and philosophies can make courses more student-centered. Web 2.0 technology emphasizes social networking. Online learning environments can be used for enhanced communication among students, as well as between students and the instructor. Creating learning opportunities that harness the power of Web 2.0 technologies for collaborative learning, distributed knowledge sharing, and the creation of media-rich learning objects can further the scope of what students can learn by “placing ... the control of learning itself into the hands of the learner” (Downes, 2005). These tools provide an avenue for students to spend more time on task, from sharing ideas and their understanding of the course content to collaborating in creating artifacts that represent their learning, whether in a traditional or an online class- room. (Delich, Kelly, McIntosh)

A few ways Web 2.0 technologies can support project-based learning include: blogs for journaling assignments, wikis for creating content in collaborative group projects, podcasts for audio-based assignments, vodcasts for video-based assignments, and RSS feeds for syndication. The creativity and remixing of technologies is an exciting new direction for both instructors and students. (Delich, Kelly, McIntosh)

Creating online courses in which students construct their own meaning with hands-on activities may radically change how teaching and learning is designed. Delivering an online course with content created by either a publisher or an instructor alone is no longer considered an effective strategy. Students working in environments that shift learning to knowledge construction rather than by assimilating what the instructor delivers will create courses that “resemble a language or conversation rather than a book or manual” (Downes, 2005)

Web 2.0 technologies and their use in teaching and learning are currently in a nascent state. Further research on the adoption and use of Web 2.0 technologies, and their effects on teacher philosophies with respect to teaching and learning, will deepen our understanding of how to use these technologies to design courses that engage and retain students.(Delich, Kelly, McIntosh)

E-learning

It is an education system where is defined as interactive learning in which the learning content is available online and provides automatic feedback to the student's learning activities. Online communication with real people may or may not be included, but the focus of e- learning is usually more on the learning content than on communication between learners and tutors.

Distance learning, distributed learning, online learning, e-learning, virtual learning, asynchronous learning, computer supported collaborative learning, web-based learning etc. are a few of the many terms used to describe learning in environments in which students and instructors are not physically present in the same location. In developing fields, it is commonplace that a variety of terminology is used to describe a new phenomenon. Clark and Mayer (2003) chose the word e-learning and described its functionality:

[T]he “e” in e-learning refers to the “how”—the course is digitized so it can be stored in electronic form. The “learning” in e-learning refers to the “what”—the course includes content and ways to help people learn it—and the “why”—that the purpose is to help individuals achieve educational goals. (Delich, Kelly, McIntosh)

The term e-learning, as well as some of the other terms, will eventually disappear. Electronic delivery will become just one of the options which we will consider to optimize learning for people. (Delich, Kelly, McIntosh)

The term e-learning is not very precise, and it should be pointed out that learning is just one element of education. So, the term online education should cover a much broader range of services than the term e-learning. One may also claim that e-learning companies often focus on course content, while online education institutions cover the whole range of educational services. (Paulsen, 2002)

With the advance of information and communication technology (ICT) and the growth of interest in the use of the Internet for education, teachers are now working in new online environments. In line with this situation, there is great need for teacher development in the integration of ICT into teaching and learning activities and in the design, implementation and evolution of e-learning. In productive and practical ways, computer-mediated communication (CMC) can help teachers build and apply their knowledge, collaborate in their learning with fellow teachers, and reflect on their classroom practice. It's a great impact on students achievement. (Son, 2004)

An Australian government report recognizes that “ education of the highest quality requires teachers of the highest quality” (Department of Education, Science and Training, 2000). In improving the quality of teachers, professional development has been identified as a key factor (Pratt, Lai & Munro, 2001). It plays a significant role in ensuring that teachers are able to enhance student learning in their teaching situations. (Son, 2004)

2.4.2 INTERACTIVE LEARNING SYSTEM

For a better understanding and better learning interactivity is needed in all education strategies. In order to have interactivity one should read, or listen then have a process in his mind then reply. This is the guarantee to reach the mind of a person.

Many computer-driven interactive learning systems were described up to now. They are usually tailored for the need of the learner. A good example is the programs for the training personnel in the use of application programs:

Many computer programs exist for performing often used functions such as word processing, financial spread sheeting, and database functions. Such computer programs are referred to herein as application programs. Examples of application programs in widespread use are LOTUS 1-2-3 and WORDPERFECT. "Application program" as used herein also includes an operating system program such as the DOS where a user is learning to use the operating system program. The training of personnel in the use of application programs may be performed by various methods. Such training may be accomplished via a traditional approach in which students are taught by a teacher with written reference materials, such as a user's manual for the application program. In addition, each student may be provided with a computer for executing the application program being learned so that the instruction is augmented by hands-on experience. This traditional type of instruction has disadvantages such as the relatively infrequent scheduling of classes and limited availability of personal instruction due to class size.

One alternative to the traditional approach to learning application programs is the use of computer-driven interactive learning systems which can be used by a single student. One such interactive learning system is described in U.S. Pat. No. 4,637,797 to Whitney, et al. That patent describes a computer-driven software training system in which a computer is coupled to a cassette tape player system. The training system operates by selectively activating the cassette player to provide oral instruction to the student, and by analyzing the student's keystrokes input while the computer program being taught is running. If the student makes the correct keystrokes, the tape player is turned on and the oral lesson continues. If an incorrect entry is made, the learning system enters the correct entry and proceeds with the next portion of the training lesson.

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 color, graphics, sound, animation, third dimension and interactive sections.

Visualization is an important technique in understanding of spatial data. Three-dimensional objects can be created and manipulated just as easily as two-dimensional plots. Other parameters can be mapped onto objects through the use of "color," "glyphs," or "isosurfaces," thus increasing the dimensionality of the image. Traditional tools for visual communication of resource issues have included simple graphic devices such as maps, line charts, sketches, photographs, and renderings. The new tools include coloured computer maps, 3D models, animations, and interactive virtual reality environments used to explore design ideas. Computer animation or animation respectively is a film sequence that is generated from a limited succession of previously defined camera viewpoints. Interactions are not possible during an animation. Today, the visualization is now used in a variety of disciplines. Because visualization is used to illustrate and investigate numerical data with images, photogrammetry, which interests with images, is strongly influenced by developments of the visualization techniques. Visualization is used by photogrammetry as well as for presentation and for the teaching purposes as the use of techniques for the display of mathematical relations and photogrammetric operations. Important advantages of the visualization are interactivity and animation possibilities. A good visualization technique must provide the following features: Portability: The visualization software and hardware used should be portable and run on all kind of computers. The visualization technique should be flexible, allowing the user to visualize the data in a customized way with a minimum amount of work due to configuration settings. The user should be able to change all the parameters of the visualization process while illustrating and investigating the data. Virtual Reality is the interactive real-time-walk-through of the model. For two-dimensional images VRML is important software for modelling. For three-dimensional cases it can easily be integrated into WWW pages to present three-dimensional data sets

with optional user interaction. The most important software developed for visualization purposes is JAVA. It has created the possibility to write and compile software once and run it on different platforms without modification. JAVA is close coupled with HTML and VRML and creates portable and interactive applications based on the Internet. (Külür)

3.1 Text

Text is still the inevitable part of education materials. It is the best way to transfer knowledge. 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.

Font and size of letters are two important features of every text. These variables are very important when preparing any text. The most widely used font name is Times New Roman, and the most widely used font size is 12.

The Times New Roman appeared for the first time on October 3rd 1932 in the Times. Only forty years later, while the conditions of printing had completely changed, it was replaced by another.

Computers have also the advantage of changing the size and fonts of pre-prepared texts when reading. Most comfortable reading size differs in every individual. It is impossible to change the size of letters of any printed text. Whereas it is so easy to adjust it according to readers' wishes very easily on computers. Furthermore, computers have also the chance of changing color and font of every text.

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.

Actually the quality of print on the screen is significantly poorer than that on a printed

page. But recently the screens were developed highly. The ease of searching a particular word on text is the most important advantage when compared with a printed text. (Clarke, 2001: 79)

3.2 Color

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

Color is a powerful motivating force. People will often judge colored 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. It is sensible to use color as an additional cue or focusing device combined with other design elements such as graphical features (for example, lines and boxes). The learners are therefore provided with two opportunities to have their attention drawn to the key information or to realize that certain chunks of information are related. You should test the interface on a monochrome display to ensure that color blind individuals are not disadvantaged by the design. (Clarke, 2001: 95)

Color can serve a wide variety of roles including:

- attracting learners' attention
- aiding retention of learning
- emphasizing key points or areas of the display
- adding interest to a display or illustration
- helping learners to identify an individual object in a complex display (for example, simulation of a process plant)
- grouping objects and information together.

To gain the positive advantages of using colour it must be used in a systematic way to achieve a distinct objective. Random use of colour because it appears attractive is not

going to achieve your goals. It is likely to have the opposite effect. It can add to eye strain and may cause after-images to appear to learners for some time after they have completed using the material. Colour provides visual clues to attract the learner but needs to be used consistently and systematically. You must decide what you want to draw the learners' attention to. Colour can be a distraction if over-used. (Clarke, 2001: 95)

Colours are often associated with particular meanings such as:

- red for danger
- black for mourning
- purple for regal
- yellow for excitement
- violet for mysterious
- green for placid.

3.3 Illustrations

All sort of illustrations are very helpful tools in order to clarify the data explained in the text. Pictures, drawings, graphics, animations can be used to explain the topic.

3.4 Sound

Sound is another impulse beside visualization. Computer aided education materials have the advantage of having sound beside vision. Sound may be vocalization of the text or specific sounds of various actions. Giving the data in more than one means may improve the quality of learning.

3.5 Video

Video clips are very important tools for expressing information. It combined motion, sound and feelings. So it will be easy to remember an action on a video than narration. Live videos and animations may be used for this purpose.

3.6 Characteristic of the Learner

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. 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
- educational experience
- learning skills
- gender
- physical characteristics
- reading age
- knowledge of the subject
- first language.

The design of computer-based learning Clarke Alan advised to commence with a consideration of the learners' needs and characteristics. For example:

1. Learners who have never used a computer could find interacting with a display by pointing and clicking with a mouse so distracting that they ignore the learning material in favour of the challenge the mouse presents.
2. Men are more likely to be color blind than women so material which relies solely on an object changing color to provide feedback may not be perceived by a proportion of male users.
3. Older learners may not have the manual dexterity to operate input devices with the de

4. ROLE OF COMPUTERS IN EDUCATION

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 colorful 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.
- Interactive modules are very helpful both teaching and checking the learning levels. Macromedia Flash and similar applications are easy to use to create interactive modules for teaching or checking purposes.
- Softwares are easy to carry, copy and distribute
- A major advantage is the flexibility of the content in computer education. It is so easy to update the data, so it gives the teacher to giving the latest data to his students
- But for me the most important tool in computer aided education is “search engine” It is not comparable to search a topic in a 4 volume book and an electronic document. The search menu is the most important and fastest tool to reach the target.

The computer technology has a deep impact on education. Computer education forms a part of the school and college curricula, as it is important for every individual today, to have the basic knowledge of computers. The advantages of computers in education include an efficient storage and rendition of information, quick information processing and very importantly the saving of paper. (Oak, 2008)

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.

In the past twenty years there has been a lot of discussion about the advantages and disadvantages of using computers with children in the classroom setting. Educators have divided themselves into two groups; the computer enthusiasts and the skeptics. Armed with glowing anecdotal evidence of great intellectual strides made by children with computers. The enthusiasts have lobbied for the allocation of more and more resources for computer-related instruction and management in education. The skeptics, on the other hand continue to demand hard evidence to show that putting children on computers can increase the literacy rate, raise test scores, improve student retention, and indeed, give the overall boost to our ailing educational institutions that is being hyped by the vendors of the new instructional technologies. (Blomeyer, Martin)

Aydin presented the advantages of computer-supported training in comparison with the other training system, which has been implemented up to the present as follows:

First of all, the student determines the learning rate directly. In another saying, the student asks the next information or question to himself when he gets ready. Second, it ensures a more directly and clear stimulation-reaction interaction. Thus, immediate feedback of information and conclusions can be realized. Third and last one, opportunity of repetition in desired number is provided without trying the teacher's patient or compelling the other students to listen the same things. In current applications, the students and the teacher convene in the same place on the same time and the teacher sees the students physically. As a result of combining CAE instructing technique with TV, the student will get the opportunity to study in his own house and his own terminal. The teacher will supervise, monitor the developments and make the necessary warnings via remote control. (Aydin, Saraçer, 2008)

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: 161)

Computer aided education is also used to train managers in new policies using the computer based management learning environment, or CBMLE. In a multi platform environment that includes sophisticated versions of positive reinforcement and a fun gaming element, managers are given business problems to solve using the policy options given to them via the CBMLE. This encourages lateral thinking for problem solving with new information. (M/Cyclopedia)

However, computer aided education has encountered some problems as well, especially within the business sector. Whilst managers generally understand the benefits of CAE, employees often do not. In a study completed by John Henry, it was revealed that 88.5% of workers surveyed thought that computer aided education is too difficult to use and they cannot see the benefits of implementing such a program. (Henry, 1994)

As long as computer aided education may encounter some negativity from people resistant to change, there is no doubt that this educational tool is extremely valuable. From children to adults, there is much to be gained from computer-aided education's interactive and self-motivating format for learning. (M/Cyclopedia)

5.1 “False and Correct Addendum” Versus Correct education supplies

The first and most important advantage is the easy update possibility of the content in computer aided education methods. Many years ago before the computer aided publishing methods there were “False and Correct Addendum” at the back of each book. Because

although they tried to do their best for checking the typing errors prior to publication, there were always some mistakes that will be noticed later. So there was always a correction page at the back of each book. It can only be done for typing mistakes. But for narration mistakes there were nothing to do. After the computerized publishing equipments this was no more a major problem, because it provides the possibility correcting easily anytime.

5.2 Education material Update

As time goes by technical information develops, methods improve, and almost all sort of data changes. As we see at the first section of the thesis even most trusted Encyclopedias need update. Computer assisted education materials are very suitable for easy update whereas published books were not possible to update. Publishing a new version of the book in order to correct or update 5% is nearly impossible.

5.3 Instruction Manuel

When launching a new product it is very hard to prepare an instruction or how to use booklet for manufactures. It is always horrible to start to use brand new equipment after reading a huge boring instructions booklet with tiny letters. Instead of that booklet a CD showing the basic steps with animation or figures will be much easier to understand and will be less annoying for the consumer. Then in case of a problem it will be much easier to search that particular problem, instead of reading the whole possible problems.

5.4 Decrease of labor

Every year labor is getting more and more expensive in all fields. For example foreign language courses were very high in number and very popular at previous decades. But recently instead of having courses or getting private lessons, individuals are obliged to study by themselves for economic reasons. Therefore, developing a new computer aided education material is of importance. It is more interactively as a teaching and learning module. This new module will assist the students to deeply understand and control their level with the interactive module provided beside the education tool (Sabariman, 2008).

5.5 Chance of sharing personal experience, ideas and new methods

Blog pages and forums are very helpful sites to share personal experience, ideas and new methods. Writing and publishing a textbook is a lot of time consuming and ambitious work. It is very hard to dare to publish a book on almost every field of science. Furthermore it needs an investment beside. But recent advances in computer aided education it is possible to write a paper on a blog page or discuss it on a forum. I observed that many people wanted to share a bid of information or new method with others. But this piece of information was not enough for writing a book. They always had the anxiety of sharing it. But now it is very easy and almost free to share this knowledge on World Wide Web.

5.6 Chance of searching in seconds

The most important advantage for me the search engines on World Wide Web. The most important tool in computer aided education is “search engines” It is not comparable to search a topics in books or journals. The search menu is the most important and fastest tool to reach the target. More than that 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.

5.7 Chances of asking questions

There are many forums where you can share ideas and ask questions. By this way one can also reach unpublished data. It is also possible to ask the question with a nickname. This eradicates the possibility of peer pressure. It may seem as a not important issue for a group of people. But we have to consider the number of people who do not dare to ask any question with the feeling of shy. So possibility of nickname brings comfort for this group of people.

6. 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.

Manali Oak started his article with a question then he replied.

“I asked myself whether I would have preferred being taught by means of a computer in school, or were textbooks the best option? I got a positive answer that reiterated to myself, the importance of textbooks. But have we asked this to the students of today? What would their answer be? They are seen to prefer computers. Some find it easier to read from the screen than from fat books. Some think that the machine makes the process of reading user-friendly. There are still some individuals, who dislike reading from computers and take to reading books. On the whole, there are mixed views on the topic and the ideas of both computer teaching and teaching from textbooks have their own share of fan following. Technology is the need of the day and is also very ubiquitous. It has proved beneficial in all spheres of life.” (Oak, 2008)

When we remember the period before publishing, the education system was much more personal with teachers and handwriting. Publishing and books can be accepted as the first revolution in education. The second revolution may be accepted as the invention of computers.

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)

Textbooks have been an integral part of education since long. School years consisted of studying from prescribed textbooks and applying whatever is learnt, to class tests and important exams. Then came the field one pursued as his/her profession. The years of specialization have always been drowned in textbooks and reference books. Once in a while, computer teaching supplemented textbooks. But today the picture has changed. We do not see books engulfing the educative years. Computer teaching plays a major role in the education of today.

A lot many things are simpler to teach by means of computers. If the information is supplemented with an attractive interface, it can result in greater readership. The different font styles, colors and sizes provided by the computer software enable ease in reading and understanding. Content on a computer can be made livelier than in textbooks by eye-catching pictures, colors and animations.

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.

Manali Oak noted that “Next appear the concerns such as saving paper and optimizing information storage. It is quite obvious that a lot of paper is used in the making of textbooks. For bringing out elaborate explanations on topics, books take up a lot of pages, thus contributing to a high amount of the usage of paper. Information can be stored in a condensed form on computer systems, thus saving paper and environment! The high storage capacities of electronic devices can be harnessed for the housing of information. Electronically erasable memory devices can be used repeatedly. This minimizes redundancy and promotes reuse.

Computer teaching can inculcate the idea of self-study in students. It can help them become self-reliant. Computer teaching introduces the students to a new world of knowledge. It makes way for new technology to be a part of their education. In my view, computers can be a brilliant aid to teaching. It is time we harness technology for education but textbooks can never go out of date. The treasure enclosed in textbooks is still of great utility. The information store that the textbooks bear, is indeed worth a read. Computers can replace textbooks to a certain extent. But the human component has no substitute. In any form of teaching, teachers are irreplaceable. (Oak, 2008)

I agree with the author “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.

People who choose distance education, usually do not have any option to study. It is reported that distance education has also many great demands. Initially they should have a higher autonomy. Because they will be sitting alone with their computers contrary to classroom learners. Another difference is peer pressure which is present in classes whereas not present in distance education. This unique difference may be accepted as a positive specification of the system. Because some individuals may dislike peer pressure. Individuals should encourage themselves. They also should control and motivate their learning strategies. So distance education is usually tailored for adults. The most frequent

course for adults is foreign language training. So the most popular distance training subject is foreign language.

Although they aim to continue education in distance they need a support to reach when they need.

As a sample Stella Hurd focused on this issue in UK:

“Support is available to those who want it. First, there is Student Services, a dedicated unit that operates in all the 13 au regional centres across the UK, using staff trained to advise on a range of issues concerning academic study. Second, each student is assigned to a designated tutor in their region, who can be contacted at agreed times for advice, and who conducts regular tutorials and the occasional day school at one of the regional centers.”

Tutorials are optional and are conducted either face-to-face, online or by telephone, depending on the particular course and personal circumstances of individual students. In such a highly structured set-up it is reasonable to ask if autonomy has any role to play at all. (Holmberg, Shelley, White, 2005)

A patent application was done to create a device and a method for computer-assisted learning of orthography, in which the selection of words should be such that the overall learning effect for the user, over a large number of queries, is as large as possible. A further goal is to simultaneously keep the use of computer resources, such as processor load and storage requirements, as small as possible. Operating a learning system or device in a theoretically optimal way is satisfying to the user, since this avoids on the one hand needless repetition, leading to boredom, and on the other hand excessive variation and difficulty, leading to frustration. (USPTO Patent Application 20090029328)

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 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). 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 instruction (CAI) 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.

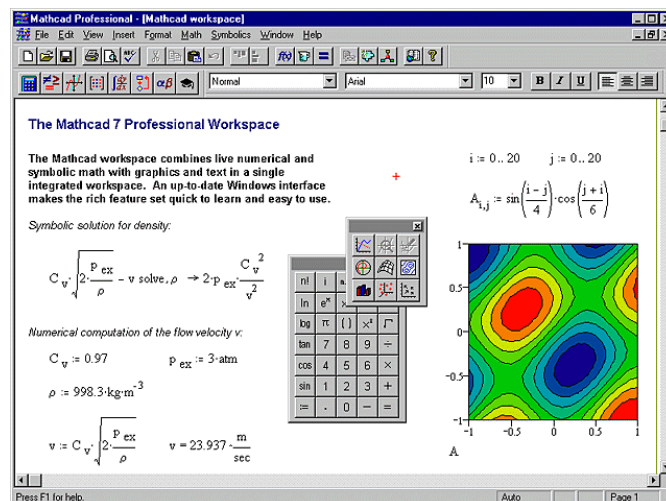


Figure 6.1 The Mathcad 7 Professional Workspace
(<http://www.mpassociates.gr/software/distrib/science/mathsoft/1.gif>)

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.

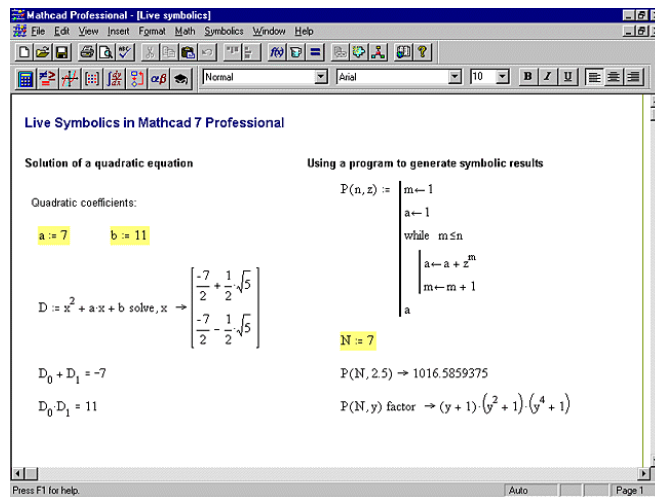


Figure 6.2 Live Symbolics in Mathcad 7 Professional
(<http://www.mpassociates.gr/software/distrib/science/mathsoft/4.gif>)

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.

The Mellon Project in Computer Aided Instruction

In late 1996 we decided to conduct a formal investigation of the themes discussed in the previous section. A Mellon Foundation grant was obtained to support assessment of computer aided teaching of Business Calculus, through a controlled experiment. The experiment was conducted in the Fall 1997 and Spring 1998 semesters; the goal was to evaluate the efficiency of CAI in enhancing the understanding of important mathematical concepts and in making mathematics more interesting / accessible to the students. A total of nine sections (approximately 180 students) were involved: a test group of five sections and a control group of four sections.

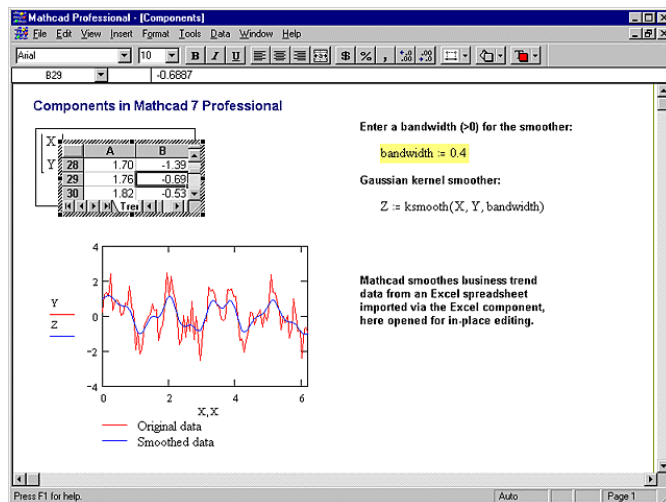


Figure 6.3 Components in Mathcad 7 Professional
(<http://www.mpassociates.gr/software/distrib/science/mathsoft/2.gif>)

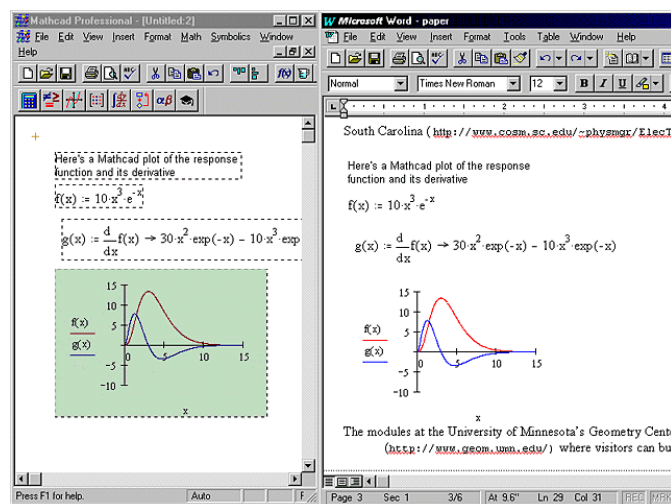


Figure 6.4 Screenshot from Mathcad 7 Professional
(<http://www.mpassociates.gr/software/distrib/science/mathsoft/3.gif>)

Two pilot sections (one test, one control) were taught in Fall 1997. Our main goal during this phase was to familiarize ourselves with the symbolic math software MathCad and with teaching computer lab-based courses. We 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). We found this feature very useful both for demonstration by the instructor and for experimentation by the students.

The main phase of the project was conducted in Spring 1998 and involved 118 students. In this paper we are reporting the results of the main phase. Three control sections (involving 58 students) were taught in the traditional, non-computerized way, with classroom lectures and using a paper textbook. Four test sections (involving 60 students) were taught in the following manner: approximately 50% of the teaching time was spent in the lab, with hands-on experimentation using MathCad; another 25% of teaching time was used for lecturing in the lab, again utilizing MathCad for demonstrations by the instructor; the remaining 25% of teaching time was used for conventional, classroom activities. Hypertext notes (written in MathCad) were prepared by us and used by the students for self study. We also made extensive use of a Web system for distributing course information (e.g. syllabus, weekly schedule and assignments, homework). We have found this to be a very efficient method of information dissemination.

They have collected data and they divide into four group.

1. Historical data (e.g. students' high school general and math grades, "desmi" membership, students' GPA and introductory math and CS grades at ACT).
2. Performance in the Math 101 course (final grade).
3. Math concepts understanding (measured by a concepts pre-test and a concepts post-test; these contain material not necessarily taught in class, with emphasis on conceptual understanding and problem-solving).
4. Student attitude (measured by three attitude questionnaires, administered at the beginning, middle and end of the Math 101 course).

ASSESSMENT

They present some preliminary results, which are based, on the above-mentioned data and on statistical hypothesis testing. We are generally interested in evaluating differences between the test and control sections in the following areas:

1. Enhancing the understanding of important mathematical concepts.
2. Improving mathematical performance.
3. Making mathematics more interesting to the students.

In addition to the above, we are interested in finding possible differences in the background of the students who participated in the CAI and traditional sections. We test for such differences using standard hypothesis testing (using the t-distribution). The quantities we test are as follows. (Kehagias, Vlachos)

1. **M100 Grade (0 to 4).** This is the grade received in the introductory math course, which is a prerequisite to the Math 101 course; it can be taken to reflect mathematical proficiency of the incoming students at the beginning of the experiment.
2. **CS101 Grade (0 to 4).** This is the grade received in the introductory computer science course; it can be taken to reflect computer proficiency of the incoming students at the beginning of the experiment.
3. **M101 Grade (0 to 4).** This is the final grade received in the Math101 course and may be taken to reflect mathematical proficiency (regarding both technical skills and conceptual understanding) at the end of the experiment.
4. **M101–M100 Grade.** This is the difference between items 1 and 3 and may be taken to reflect *differential* in mathematical proficiency which resulted from taking the (CAI or traditional) course.
5. **GPA.** This reflects the overall academic performance of the students.
6. **Preliminary Concepts exam (0 to 4).** This quantity is the grade received in a *mathematical concepts understanding* exam administered at the beginning of the course.
7. **Final Concepts exam (0 to 4).** The same as the previous item, but measured at the end of the course.
8. **Prelim. Concepts – Final Concepts.** This is the difference between items 6 and 7 and can be taken to reflect the *differential improvement* in understanding

mathematical concepts, which resulted from taking the course.

9. **CS attitude (1 to 5).** This quantity was obtained from an attitude questionnaire administered to the students at the end of the course. It is actually the average of several questions asked regarding the students' attitude about computers.

10. **Math attitude (1 to 5).** This item is similar to the previous one, except that it concerns mathematics rather than computers.

11. **Q: I look forward to coming to class (1 to 5).** This and the next item are questions directly quoted from the attitude questionnaire. They are intended to evaluate the attitude of the students to the particular course (Math 101) rather than to mathematics in general.

12. **Q: I will recommend this class to a fellow student (1 to 5).** See the previous item.

In Table 6.1 we present the results of the hypotheses tests. In every case we test the null hypothesis (i.e. that the relevant quantity has the same distribution for the student sample coming from the CAI and the traditional sections). In every case we list the average of the quantity for the CAI and traditional section, the corresponding t-value and the corresponding p-value, i.e. the probability that the CAI and traditional samples come from the same distribution. (Kehagias, Vlachos)

Attitude to the course: Two questions are relevant here: "I look forward to coming to class" and "I will recommend this class to a fellow student". In both cases, CAI students exhibit a markedly better attitude than traditional ones. This is more obvious in the first question (p-value is 0.022104, so the result is statistically significant); in the second question CAI students again have a more positive attitude, which is nearly significant at the 10% significance level (p-value is 0.104718).

Table 6.1 Several interesting remarks (of a preliminary character) can be made regarding the results of the above table.

(<http://users.auth.gr/~kehagiat/KehPub/other/1999Karanikas.pdf>)

Item	CAI mean	TRA mean	t-value	p-value
M100 Grade (0 to 4)	2.68	2.52	0.818573	0.414588
CS101 Grade (0 to 4)	3.00	2.83	1.125226	0.262649
M101 Grade (0 to 4)	2.47	1.94	2.469418	0.014894
M101–M100 Grade	–0.21	–0.59	2.166143	0.032213
GPA	2.86	2.51	2.525280	0.012811
Preliminary Concepts exam (0 to 4)	1.41	1.17	1.639328	0.103659
Final Concepts exam (0 to 4)	3.06	2.58	3.073958	0.002594
Prelim. Concepts – Final Concepts	1.65	1.40	1.356195	0.177482
CS attitude (1 to 5)	4.2	3.93	2.114560	0.366093
Math attitude (1 to 5)	4.02	3.84	1.827858	0.070141
Q: I look forward to coming to class (1 to 5)	3.80	3.396	2.319737	0.022104
Q: I will recommend this class to a fellow student (1 to 5)	4.03	3.74	1.635201	0.104718

General mathematics and computers attitude: It is quite clear that CAI students have a more positive attitude towards mathematics than traditional students (p-value is 0.070141). Interestingly enough, there is no significant difference of attitude towards computers (p-value is 0.366093). It would certainly seem reasonable that students with a better attitude to computers would be attracted to a CAI math course. Keeping in mind that the results presented here pertain to attitudes at the *end of the course*, it would be interesting to compare computer attitude at the *beginning of the course*, as well as to compute *differential attitude* from the beginning until the end of the course. For instance, it is possible that CAI students “overdosed” in computer technology. It would also be interesting to do a follow-up questionnaire (say a year later) in order to investigate how lasting the above attitudes (to both math and computers) are.

Mathematical and computers preparation: While the CAI group has higher grades in introductory courses in both mathematics and computers (and it is plausible to assume that they are also better prepared in these subjects), this difference is *not* statistically significant (p-values 0.414588 and 0.262649, respectively).

Mathematical proficiency: While the CAI group has higher grades in introductory courses in Math100 this difference is *not* statistically significant (p-value 0.414588). Math101 grade difference is statistically highly significant (p-value is 0.014894) and the differential between M101–M100 Grade is also statistically highly significant (p-value is 0.032213).

Conceptual understanding: There is a statistically significant difference between the CAI and traditional groups in their performance at the Preliminary Concepts exam (p-value is 0.079916), as well as at the Final Concepts exam (p-value is 0.002594). The differential performance (i.e. difference in performance at the end and beginning of the course) is *not* statistically significant (p-value is 0.177482).

General Academic Performance: Here we see a statistically significant difference (p-value is 0.012811): CAI students have a higher GPA than traditional ones. (Kehagias, Vlachos)

According to their work's results, it appears that CAI did not make a difference as far as *concepts understanding* is concerned. More specifically, CAI 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, CAI *did* make a difference regarding general mathematical performance (as measured by the final grade) both in absolute and differential terms. CAI also made a difference regarding the attitude of the students to the course (i.e. students liked the CAI course better than the traditional one). Statistics and numbers does not tell the whole story. So it is useful to briefly relate our informal experiences. They definitely felt throughout the course that CAI students were more active and interested than the traditional ones. They believe that an important component of the CAI process is not necessarily related to computers per se, but to the more active part played by CAI students, who had a larger proportion of their classroom

time devoted to active participation (e.g. problem solving) than to passively listening to lectures.

They also find it computers did play a positive role, in "sweetening mathematics". In other words, the fact that computers played a prominent role in the CAI course, may have taken the students attention away from mathematics and made them subliminally more receptive. They have found that, the CAI 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 CAI 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 CAI students were better and remained so at the end of the course. Statistical analysis offers a further significant insight: not only were CAI students better in absolute terms, but they also improved more than traditional students. (Kehagias, Vlachos)

Finally, regarding the understanding of mathematical concepts, we have found that CAI 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 CAI students were originally better at conceptual understanding and remained so at the end of the class. A scenario which they find plausible after consideration of the statistical analysis and their subjective experiences is that better students were drawn to the CAI course than to the traditional one. This seems to be supported by the statistically significant difference in GPA between the CAI and traditional students. (Kehagias, Vlachos)

In conclusion, we do feel that the CAI course was a useful improvement over the traditional course and we intend to refine and repeat it. Teaching MathCad to CAI students created an overhead, which was partly compensated by spending less time in teaching traditional techniques of differentiation and integration. We were able to cover

approximately the same material in both the CAI and traditional sections. While we acknowledge that some of the CAI course benefits may not be due to computers but to a more positive attitude (on our and the students' part) to experimentation, it must be kept in mind that we have only taught the CAI course for a couple of years, as opposed to the traditional course, which we teach for over a decade. Taking all of these factors into account, we expect to reap even greater benefits from CAI approaches in the future, as our technique improves.

Eventually educators who may be interested in introducing a CAI mathematics course. Computers exert an appeal to students, which eases acceptance of the mathematical content of the course. In addition, students appear to definitely prefer hands-on experience from conventional lecturing in the classroom. Also, Technology enables us to teach mathematics better through demonstration and experimentation. Of course, the active role played by students through computer experimentation is also enhancing the learning process. On the other hand, the instructor must maintain a fine balance between the technical and the conceptual component of a CAI course. (Kehagias, Vlachos)

7. 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.

If we make assessment of thesis; in first chapter is introduction in which the aim of the thesis is described. General knowledge and history of computer-aided education are explained in the second chapter. Computer aided education types are also examined in this chapter with two case study for an evidence. Third chapter is consists of designing materials for computer aided education. Fourth chapter includes roles of computers in education than in fifth chapter we emphasize advantages of computer-aided education. In Sixth chapter, computer aided education and traditional education is compared before conclusion part of the thesis.

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 Introduction part I wanted to tell computer aided education is not a new fact. Because of usage of computer in data communication has commenced in 15th Century.

After introduction part, give definition and short timeline of Computer education. Especially, I mentioned PLATO (Programmed Logic for Automated Teaching Operations), which was first generalized computer, aided education system. Then I tell about types of computer-aided education for example autonomy, model creation, demonstration, game model, storytelling model, virtual reality, animation, e-journals, online meeting, user created content and e-books. In education part one of related case study quoted which is to show superiority on using animation in education than traditional education. Also Online education analyzed in this part.

Third part was designing computer based education materials examined like text, color, illustrations, sound, video and characteristics of the learner. Next chapters I told role of computers in education and advantages of computer aided education which I defense computer aided educations superiority.

In final, which is, aim of thesis is comparison of computer aided education vs. traditional education. 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.

REFERENCES

- Akbaş G. A., (2006), “*Online Education and Uses of Online Education in Universities*”, Yeditepe University – Visual Communication Design Department Thesis, Istanbul.
- Alkan, C., (1997), “*Eğitimin Kavramsal Boyutu*”-“*Conceptual Aspect of Distance Education, Uzaktan Eğitim-Distance Education*”, ISSN-1301-336X, Eskisehir, TURKEY, p.7.
- Aydın E. D., “*Bilgisayar Destekli Eğitim / Bilgilenme “-”Computer Aided Education / Enlightenment*”, Yeditepe University.
- Aydın E. D., (2006), “*Computer Assisted Education / Obtaining Information*”, The World of Communication, TUTED Monthly Publication Organ, İstanbul.
- Aydın E. D., (2005), “*Introduction to Computer Science*”, Yeditepe University Press, İstanbul.
- Aydın E. D., Saraçer N., “*Computer Aided Education / Information*”, International Symposium of Interactive Media Design, Available on page http://newmedia.yeditepe.edu.tr/pdfs/isimd_08/emin_dogan_aydin_neda02.pdf
- Aydın, E. D., Sütçü C., “*The Role of Information Systems within Distance Education and A Case from Turkey*”, <http://mimoza.marmara.edu.tr/~csutcu/The%20Role%20of%20Information%20Systemsiacis99v.pdf>
- Banaszewski, T., (2006), “*Digital Storytelling Finds Its Place in the Classroom*”, Available on page <http://www.infoday.com/MMSchools/jan02/banaszewski.htm>
- Bitzer D., (1991), “*The Wide World of Computer Based Education*”, Computer based Education Research Laboratory, University of Illinois at Urbana Champaign, Urbana,

Illinois Blomeyer Robert L., Martin Dianne, “*Case Studies in Computer Aided Learning*”, The Falmer Press, p10.

Britannica Online Encyclopedia, “ Education “ , Available on page <http://www.britannica.com/EBchecked/topic/179408/education>

California State University, Long Beach, “*History, the History of Computers, and the History of Computers in Education*”, Available on page <http://www.csulb.edu/~murdock/histofcs.html>

Chandrakumar V., (2009), “*Use and Usefulness of E-journals: a Case study of Research Scholars*”, Available on page <http://www.inflibnet.ac.in/caliber2009/CaliberPDF/V%20Chandrakumar.ppt>, University of Madras, India.

Charron, C., Favier, J. & Li, C., (2006) “*Social computing: How networks erode institutional power, and what to do about it*”, Forrester Research, Available on page <http://www.forrester.com/Research/Document/Excerpt/0,7211,38772,00.html>

Clarke A., (2001), “*Designing Computer Based Learning Materials*”, Gower Publishing Limited, Great Britain.

Department of Education, Science and Training, (2000) “*Teachers for the 21st century-Making the Difference*”. Available on page www.detya.gov.au/schools/Publications/2000/t21.htm

Downes, S., (2005) “*E-learning 2.0.*”, *eLearn Magazine*, Association for Computing Machinery Inc., Available on page <http://elearnmag.org/subpage.cfm?section=articles&article=29-1>

Fallman, D., “*Introduction to VR in Education*”, Available on page <http://www.informatik.umu.se/~dfallman/projects/vrie/intro.html>

Fang Meiqi, Rao Jinghai, Su Xiaomeng, Li Tieyan, “*A Web-Based Collaborative Learning System*”, Renmin University Beijing, China, <http://www.cs.cmu.edu/~jinghai/papers/WCLS.pdf>

Gagne Robert M., (1974), “*Educational Technology and The Learning Process*”, Florida State University.

Glendale Community College, “*E-Journals*”, Library and Media Services, Available on page http://lib.gccaz.edu/lmc/help/library_terminology.html, Arizona.

Goodman, N., (1984), “*Of Mind and Other Matters*”, Cambridge, MA: Harvard University Press.

Habertürk, (2010), “*Newspaper supplement about E-book*”, February.1.

Henry, J., (1994), “*Resistance to computer-based technology in the workplace*”, in Executive Development, vol. 7, no. 1, pp 20 – 23.

Hirtz Sandy, Harper David G., Mackenzie Sandra, *Education for a Digital World: Advice, Guidelines, and Effective Practice from Around the Globe*, In Delich Patricia, Kelly Kevin, and McIntosh Don, “*Emerging Technologies in E-learning*” Available on page http://www.colfinder.org/materials/Education_for_a_Digital_World/Education_for_a_Digital_World_part1.pdf

Hoffman, J., (2006), “*Peer-to-peer: The next hot trend in e- learning?*”, Available on page, <http://www.learningcircuits.org/2002/jan2002/hofmann.html>

Holmberg Börje, Shelley Monica, White Cynthia, (2005), “*Distance Education and Languages Evolution and Change*”, Cromwell Press Ltd., Zaphiris Panayiotis, Zacharia Giorgos, “*User-Centered Computer Aided Language Learning*”, Idea Group, USA.

Honarmand Maryam, (2008), “*Using Multimedia in Computer Based Learning*”, World Academy of Science, Engineering and Technology, Available on page <http://www.waset.org/journals/waset/v42/v42-134.pdf>

Human Interface Technology Laboratory, “Virtual Reality Learning Environments”, Available on page <http://www.hitl.washington.edu/publications/m-90-4/m-90-4.html>

Johnson D. W., Johnson Roger T., (1999) “***Learning Together and Alone – Cooperative, Competitive and Individualistic Learning***”, Allyn and Bacon, USA.

Jonassen, D.H. “*Objectivism vs. Constructivism: Do We Need a New Philosophical Paradigm?*”, University of Colorado (unpublished).

Kehagias Ath., Vlachos Pan., (1999), “*Computer Aided Instruction vs. Traditional Teaching: Comparison by a Controlled Experiment*”, Available on page <http://users.auth.gr/~kehagiat/KehPub/other/1999Karanikas.pdf>

Kizil M. S., Kerridge A. P, Hancock M. G., (2004), “*Use of Virtual Reality In Mining Education and Training*”, Available on page http://espace.library.uq.edu.au/eserv/UQ:100045/n2004_CRCMining_Noosa_Mehmet_Kizil.pdf

Knight Robert G., Titov Nickolai, “*Use of Virtual Reality Tasks to Assess Prospective Memory: Applicability and Evidence*”, Available on page <http://www.atypon-link.com/AAP/doi/abs/10.1375/brim.10.1.3>

Külür S., “*New Possibilities for the Photogrammetry Education In Turkey*”, The International Archives of the Photogrammetry, Available on page <http://www.isprs.org/commission6/proceedings02/papers/016.pdf>

LianA., (2004), “*Technology-enhanced language learning environments: A rhizomatic approach*”, Available on page http://www.andrewlian.com/andrewlian/prowww/apacall_2004/apacall_lian_ap_tell_rhizomatic.pdf

Lubin D. A., Mowatt Tyrone C., Brenneman Andrew, “*Interactive Learning System*”, Available on page <http://www.freepatentsonline.com/5395243.html>

M/Cyclopedia, (2005), “*Computer Assisted Learning*”, http://wiki.media-culture.org.au/index.php/E-Learning_-_Computer-assisted_learning , 2005.

Matsuyama Chieko, Nakashima Toyoshiro , Ishii Naohiro , “*Animation Creation in Computer Software Programming Education and its Evaluation*”, Available on page <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=01434912>

O'Reilly, T., (2005), “*What is Web 2.0? Design patterns and business models for the next generation of software*”, Available on page <http://www.oreillynnet.com/lpt/a/6228>

Oak Manali, (2008), “*Role of Computers in Education*”, Available on page <http://www.buzzle.com/articles/role-of-computers-in-education.html>

Oak Manali, (2008), “*Textbooks Versus Computer Teaching*”, Available on page <http://www.buzzle.com/articles/textbooks-versus-computer-teaching.html>

Orkan, A.L., (1992) “*Bilisim Teorisi- Information Theory*”, Marmara University TEF Press, İstanbul, pp.4-5.

Paulsen Morten Flate, (2002) “*Online Education Systems: Discussion and Definition of Terms*”, Web Education Systems Project (Web-edu), <http://www.nettskolen.com/forskning/Definition%20of%20Terms.pdf>

Perrolle Judith A., (1987), “*Computers and Social Change: Information, Property and Power*”, Available on page <http://www.ccs.neu.edu/home/perrolle/book/chapter6.html>

Pratt, K., Lai, K.-W., & Munro, P., “*Professional development for ICT using teachers*”, In K.- W. Lai, “*E-Learning: Teaching and Professional development with the internet*”, The University of Otago Press, 2001.

ReferenceAnswers, “*PLATO (Computer System)*”, Available on page <http://www.answers.com/topic/plato-2>

Roschelle, J. et al, (2005), “*Introduction to the special issue on wireless and mobile technologies in education*”, in Journal of Computer Assisted Learning, vol. 21, no. 3, pp 159 – 161.

Sabariman S. I., (2008), “*Computer Aided Education on Protection System*”, Universiti Malaysia Perlis, School of Electrical Systems Engineering, Available on page <http://dspace.unimap.edu.my/handle/123456789/4501>

Saritas, M., (2007), “*Education Technologies and Material Design*”, Pegem A. Publishing Education Consulting Services Trade Inc. Co., Baran Offset, Ankara.

Seferoglu, S. Sadi, (2006), “*Education Technologies and Material Design*”, Pegem A. Publishing Education Consulting Services Trade Inc. Co., Öncü Press, Ankara.

Singel, R., (2005), “*Are you ready for Web 2.0?*”, Wired News, Available on page <http://www.wired.com/news/print/0,1294,69114,00.html>

Son J., (2004), “*Computer-Assisted Language Learning: Concepts, Contexts and Practices*”, In Kent D., “*CALL initiatives and the Korean cultural learning context*”, iUniverse Inc, United States of America, 59.

Stead, G., Sharpe, B., Anderson, P., Cych, L. & Philpott, M., (2004), “*Emerging technologies for learning*”, British Educational Communications and Technology Agency, Available on page <http://publications.becta.org.uk/display.cfm?resID=25940>

Sunrisevr, (2009), “*Virtual Reality Learning*”, Available on page <http://www.sunrisevr.com/vrlearn.htm>

Tingöy Ozhan, Güneşer Ahmet, Öngün Erdem, Demirağ Askın, Köroğlu Osman, (2006), “*Using Storytelling in Education*”, 4th International Symposium of Interactive Media Design.

Todoroi Dumitru , Nechita Elena, Todoroi Zinaida, Todoroi Nicoleta, (2009), “*Computer Aided Education Systems in Knowledge Based Society*”, Available on page <http://revistaie.ase.ro/content/42/todoroi.pdf>

Uçarı Nazlı, (2008), *Distance Education and Distance Education In Turkey*, Yeditepe University – Visual Communication Design Department Thesis, İstanbul.

US Patent 6029043, “*Computer-Aided Group-Learning Methods and Systems*”, Available on page <http://www.patentstorm.us/patents/6029043.html>

Ushadevi L., Assistant Librarian, (2007), “*Computer Aided Teaching Packages*”, Bangalore University, Available on page <https://drtc.isibang.ac.in/bitstream/handle/1849/147/Usha.pdf?sequence=2>

USPTO Patent Application 20090029328, (2009), “*Device and method for computer-assisted learning*”, Available on page http://www.freshpatents.com/-t20090129ptan_20090029328.php

Whalley, R.M., (1998), “*Towards realising the full benefit of computer aided learning,*” in *Industrial and Commercial Training*, vol. 30, no. 2, pp 53 – 62.

Wilson, S., (2005), “*Architecture of virtual spaces and the future of VLEs.*”, October 7, Available on page <http://www.cetis.ac.uk/members/scott/resources/itslearning.ppt>

Yarlagadda, M., (2005) , “*ZDNet Video: The future of VoIP: CoIP.*”, CNET Networks, Inc., Available on page http://news.zdnet.com/2036-2_22-5933133.html?tag=wbemail

CURRICULUM VITAE OF THE AUTHOR

Personal Information:

Date of Birth: 30.06.1985

Place of Birth: İstanbul

Marital Status: Single

Education:

Graduate: 2009 – 2010 Yeditepe University, Communication Faculty
Visual Communication Design Department

Graduate: 2008 – 2009 Yeditepe University, Faculty Of Fine Arts, Graphic
Design Department

Undergraduate: 2003 – 2008 Yeditepe University, Communication Faculty
Visual Communication Design Department

High School: 1997 – 2003 Private Atayurt High School, Eskişehir

Work Experience:

2009 – ∞ Yeditepe University, Communication Faculty, Visual Communication
Design Department

2008 – 2009 Yeditepe University, Faculty Of Fine Arts, Graphic Design Department

2008 – 2008 Kanaltürk (Animation and Graphic Department)