Classical System of Education and Newer Virtual University

Ramin Sadeghi, PhD
Power & Water University of Technology
Ramin_Sadeghi@pwutic.org

Saeid Moslehpour,PhD
University of Hartford
moslehpou@hartford.edu

Abstract

In the present essay, efforts have been made to define the history and facts regarding implementation of distance learning systems in the world. Whenever inventions are developed in technology, the productivity, comprehensiveness and supervising mechanisms are point to point comparison suitably helps to express the place of the modern method; therefore, it is required to present and take into consideration the disadvantages and advantages of both methods, especially when modern education is involved with humanities and growth in psychology issues (since there is an alternative offered herewith).

This paper will describe the classic and virtual educational methods. Since this contrast requires implemented samples; therefore the advantages and disadvantages of general methods are taken into consideration.

Educational mechanism and observing them in modern educational systems for the purpose of transferring the feeling of presence in the class (educational class simulation) should as well be expressed for the purpose of justifying the application of methods on computer-basis, the multimedia tools of which have been presented on web-basis, by the existence of problems and obstacles and bottlenecks.

History of modern educational systems (Distance Learning)

The birth and development records of the electronic educational systems are chronologically as follows:
- Late 60's – Digital storage of the first experimental text in computer
- Early 70's – Presentation of classical literature in the first electronic book (eBook)
- Early 80's – Establishment of the first electronic library (e-Library) in Columbia University
- Late 80's – Publication of the 26-volume encyclopedia in electronic form
- Early 90's – Launching of the first electronic reading device by Sony Corporation
- Early 90's – First experimental classrooms in University of Michigan
- Mid 90's – Offering the experimental courses in the universities of USA, Europe and India
- 1996 – Offering the first web-based courses
- 1997 – Creation of the Virtual University
- 1999 – Coexistence of the traditional and modern virtual educational systems

Factors that accelerate the growth of distance learning can be categorized as follows:

- Development of communication systems' infrastructure
- Reduction of the price of computers from 100 to 10 during 70's to late 90's
- Increase of the processing speed of computers from 1 to 100 during 60's to late 90's
- Emergence of graphical Internet and Worldwide Web(www)
- Development of protocols for hypertexts and hypermedia

Growth of the Number of Computer Users

The number of computer users had a growth rate as shown in the following table, including an estimate for 2005[1]:
- 1993 : 13 million
- 2001: 407 million
- 2003: 650 million
- 2005: 1 billion

Examples of Integrated Systems for Virtual Learning:

The following universities are examples of the leading edge of high education in future. These institutes are pioneers of a movement called Virtual University.

All these institutes have a consensus on a central and key issue that higher education has to undergo a special evolution before it can properly respond to the needs and progressive challenges on the 21st century. This evolution is based on a new approach that is taking shape and named as "Distributed Leaning".

A new system can be envisaged that comprises the following integrated educational systems:

- California VU
- Cardeen University & Unext
- Devery University
- Michigan Virtual University
- Object J (software)
- Online National Technological University
- Ouoa
- Southern Regional Education Board , Electronics Campus
- UMCK VU
- Uportal (software)
- Virtual Media Lab, London University
- VU of Michigan & Virtual Lab
- Web-class
- WebCT & Syllabus
- Western Governors University
- Wollongong University

The methodology of Virtual University dates back to 30 years ago, when it was a static system for scientific papers and document exchange. For example the asymmetric form of

distance learning (i.e. the unidirectional presentation of educational texts as developed in the Cleveland Institute of Electronic -CIE and is formally accredited) has a 30 year record [2].

Virtual universities are mostly formed on the basis of research grants awarded to the research units of the various universities for on-line presentation of the courseware. The unique characteristics of these universities are:

- Assuming an active and effective role in learning and teaching of the course materials, and participation in conferences is a significant characteristic of Virtual Universities
- Utilizing a wide spectrum of communication facilities for teaching and learning
- Hypertext functionality that allows logical connection of the various parts of a text and adds to effectiveness of education.
- Capability and capacity for concurrent and simultaneous access on a global scale.

Studies have shown that in third world countries such as Iran, the Payam Noor University has taken some steps toward the statically on-line mode of presentation, and the Isargaran unit of the Tehran University has had a distance learning plan for some topics that includes distance teaching without multimedia functionalities.

University of Power and Water already has some modern and superior systems and facilities for distance learning.

Due to the following factors, it can be forecasted that Distance Learning will rise to a firm and new position at a much higher level that attracts particular attention of the public and the authorities:

1. dramatic rise of the people's expectations and demand for learning and in particular, higher learning
2. limitations of facilities and resources,
3. the young generation that forms the dominant part of the population,

A Review of the Global Emergence of Distance Learning Systems

- Introduction of internet-based courses in existing universities as add-on or complements to the current courses.
- More than 400 universities have established the Internet branch of learning
- Establishment of new universities on the bedrock of the Internet
- Phoenix University in USA with 12000 students
- Tamil University in India

Joint-venture of several universities in setting up Virtual Universities at an international level
- In 1996, the Ciyde University was formed by collaboration of several universities in Britain, Scotland, and some other countries.
- In 1997, the Western Governors University was created by cooperation of 16 universities.
- VCU is the Virtual University of California with 45 universities as its founders

Examples of On-Line Education

In July 1996, the UMKC started its Virtual University project with particular attention to the academic activities via remote communications and computer science. The objective of the project was to build the necessary infra-structure and basis for education but the members of the faculty utilized it for the lectures, presentations, and exercises, and defined it as a compulsory course for all.

- *Internal Interactions:* Whether you are thinking on a particular subject, or nodding your head as a sign of agreement in a video conference, Internet allows your real-time participation as an active member,
- *Selecting the Media:* Internet is not only a new media that allows an unprecedented level of internal interactions beyond the reach of other media, but also integrates all other forms of media in a single multimedia.
- *Hyper-Text:* Hyper-text and Hyperlink are the Internet-based options that allow the writer or researcher to explicitly relate the words and their meanings scattered in the various texts prepared all over the globe.
- At the end of 1995, more than 9.5 million Americans had the Internet connectivity, showing a 100% increase over the same figure for 1994. State governments promoted the information networks, and many libraries had the Internet Access and the long-distance communication companies offered the Internet services at a decreasing and minimal price [3].

Examples of Virtual University

Associated University: The virtual university of the Michigan State University (MSU) was created in 1998 with the following branches:

1. Chemical Engineering
2. Computer Design
3. Law-enforcement Police
4. Management
5. Judicial Law
6. Microbiology
7. Management of Water Resources
8. Physics and Astronomy

Tamil Virtual University (TVU)

The TVU was created in 1999 with the objective of serving the Tamil communities of the world, an doffers the following branches of service and study:

1. Tamil Language
2. Consultation
3. Tamil Culture
4. Linguistics

Comparisons of Traditional and Commercial Methods

In order to evaluate the performance of the Virtual University in comparison with the real universities, its advantages and disadvantages should be identified and measured. If its advantages offset the disadvantages, then VU is a plausible solution and worth recommending.

A list of Virtual University characteristics versus Real universities is as follows:

Tables of Comparison
The educational activities of a virtual university are based on new approaches to teaching and learning. Two key elements for activating a virtual university environment are as follows:

1. Ease of communication between student and teacher and ease of communication between the students
2. Individual and group activities and projects in the direction of educational goals and objectives.

Other factors that influence the activation of virtual university environment include the educational approaches and viewpoints that shape the methods and means of education and the classroom.

Modern approaches are based on the Information and Communication Technologies (ICT).

The comparisons are based on the following pivotal points:
Table 3-1: Educational System
Table 3-2: Central and Emphasized Issues
Table 3-3: Duties and inter-relationships of the teachers and learners
Table 3-4: Courses and the contents of each course
Table 3-5: Tests and Examinations
Table 3-6: Technology
Table 3-7: Industrial Economy
Table 3-8: Other criteria

Table 1: Educational System

	System Characteristics	Traditional View (19th & 20th centuries)	Modern View
1	Educational Environment (School & University)	Student goes to the school or university	Educational Environment goes to the student
2	Viewpoint on Teaching and Learning	Individual	Social
3	Motive forces of the system	Rules, Regulations and processes	Standards
4	Structure and Organization	Pyramidal and Hierarchical	Distributed Networks
5	Decision-making	Based on existing theories	Based on the accumulated data
6	Strategy	Top-Down	Bottom-Up
7	Methods(Management/education)	Established	Flexible
8	Source of power and survival	Conservatism	Changeability (harmonious with the needs of society)

Table 2: Central and Emphasized Issues

	System Characteristics	Traditional View (19th & 20th Centuries)	Modern View
1	Basis and Responsibility	Teacher-centered, teacher is responsible	Student-centered, student is responsible
2	Educational Activities Emphasized	Individual's activities	Group activities, collaboration, participation
3	Overall Emphasis on	Internal factors	External factors

Table 3: Duties and inter-relationships of the teachers and learners

	System Characteristics	Traditional View (19th & 20th Centuries)	Modern View
1	Learner's Duties	Memorizing prepared material	Management of information and generation of new information and skills in search of knowledge
2	Teacher – Student Relationship	Wiseman–Scholar (transfer of droplets of knowledge from teacher to student at a specific time and location)	An all encompassing group for creation of up-to-date information and skills to satisfy the dynamic needs of the society
3	Teacher's Role	Prime and Sole Player who leads all	Presence in the margin and facilitator of the learning process
4	Society's Role (Parents, Organizations,…)	Unstructured interactions about learning	Continuous Interactions towards Education for All Citizens

Table 4: Courses and the contents of each course

	System Characteristics	Traditional View (19th & 20th centuries)	Modern View
1	Volume of the course materials	Limited and selected	Unlimited and various
2	Learners' share in defining the contents	Nil	Can be a lion's share
3	Production of contents	Mass Production (of books…)	Customization for the masses (tailored to each learner)
4	Learning time spans	Compulsory, high-school and university	Learning from birth to death

Table 5: Tests and Examinations

	System Characteristics	Traditional View (19th & 20th Centuries)	Modern View
1	Nature of Tests	Replication of the course material as a justification for certificates	Tools to measure progress towards the goals
2	Time of Tests	Year-end or Term final exam	Unlimited and continuous
3	Test Results and Grades	Student's grade in examination	Statistical measures of performance in realizing the goals and objectives
4	Tests of Diagnosis	None or unused	Early warning for those who may fail and flunk

Table 6: Technology

	System Characteristics	Traditional View (19th & 20th Centuries)	Modern View
1	Use of Technology	Traditional automation	Intelligent educational systems
2	Technology's Role	A Detachable element	Convolved into the system and indispensable

Table 7: Industrial Economy

	System Characteristics	Traditional View (19th & 20th Centuries)	Modern View
1	Principles and foundation	Seller (educational system) is the determinant	Buyer (learner) is the determinant
2	Commodity involved	Certificate of Graduation	Skills, experience, and knowledge that can be produced and developed
3	Outputs of Educational System	Individual's knowledge, added value to the individual	Quantifiable Knowledge and skills of value in the domain of economy

Table 8: Other criteria

	System Characteristics	Traditional View (19th & 20th Centuries)	Modern View
1	Fruit of the educational system	A lifelong work permit for a specific occupation	Necessary knowledge and skills for a specific job at graduation time with provision of multiple changing of job during the life
2	Creativity via accumulated knowledge	Active in industrial society, with normal rewards, capable of fulfilling the pre-defined undertakings	Creative thinking and management of information creation, with the characteristics of the active individuals in a knowledge-based society

Some other dimensions will be dealt with in the continuation.

Elimination of the Need for Teacher and Student to Attend the Classroom

In Virtual University, all communications are via the internet and this removes the need for the teacher or students to be physically present in the classroom. Connection of the student or teacher to the Internet would suffice and that is possible from home or anywhere else. This is the source for many more advantages including the need for construction and maintenance of expensive buildings and educational complexes.[4]

Independence of Classroom from any Specific Time

A major portion of the educational system is based on courses that the student can access and acquire via the Internet at a time of his/her choosing. This is particularly advantageous for the employed people who have a very limited and restricted free time for furthering their education as they can study anytime during the day or night.

Courses of Higher Qualities

In traditional universities, the course is lectured or presented by a professor and this is not desirable, as he/she introduces many additional parameters that influence the flow of knowledge. Other environmental parameters such as temperature, noise …etc can also negatively influence the quality of the classroom. Such parameters are non-existent in Virtual University, where the courses are prepared by a team of experts and presented via the modern multi-media channels in a favorable mode. Another shortcoming of the traditional classrooms is that slow students may not catch up with the speed of the classroom and have no chance of repetition of the program. This lowers down the quality dramatically. In Virtual University the learner can repeat the same course as many times as is required for him to learn thoroughly and completely. This is a factor that improves the quality of education.[5]

Supporting a Very Large Number of Students in a Single Classroom

The limitations of space and reduction of efficiency in the traditional classrooms, excludes many students from the classrooms that they need to attend. In contrast, the virtual university classrooms can accommodate thousands of students simultaneously.

Scientific Credit and Status of the Virtual University
Generally, no newly established university can compete with the old and famous universities. The main reason is that the experienced and prominent professors and teachers are already engaged in their present universities and have little or no time to cooperate with the new universities. This problem is greatly reduced in virtual universities because the professor's lecture can be recorded once and played many times. The relationship of the teachers and students is also greatly facilitated as it is done via the Internet.

Elevating the level of scientific awareness of the society

In traditional universities, due to limitations of space, facilities, professors …etc; only a small number of applicants is admitted to the universities via an entrance examination. Therefore, a very large number of the potential students lose their chances of higher learning. The virtual university is free from these limitations an all members of the society can participate in higher learning and this will certainly end in a great leap forward to cultural and scientific awareness of the society.

On-line Access to Digital Libraries

In traditional universities, only a few copies of the textbooks and reference books are kept and this greatly limits the simultaneous access of all students to all books. In virtual university, all digital books and periodicals, research papers, theses and papers are safely available to all students in an on-line mode that is very efficient in terms of time and convenience.

Characteristics of Dynamic books and libraries

- Links to other parts of the books or other books
- Capabilities for searching words and expressions
- Selection and sizing of the letters and fonts
- Availability of related pictures, diagrams and other graphical representations
- Integration of teaching, testing, evaluation, and the design of progression steps
- Internet-based intelligent interactions between the student and the teacher
- Integrated educational environment with voice, keeping notes during reading, …
- Possibility of chatting with others in specific chat-rooms and participation in group discussions and forums
- Just-in-time availability of references and bibliographical sources
- Availability of icons, displays and intelligent glossaries and dictionaries

Electronic Research in Virtual Universities

In order to provide an appropriate research facility for researchers and recording of their results, a section of the virtual university web site should be allocated for this purpose. For example within the homepage of all faculties of the virtual university, a link to research

activities can be placed that points to the repository of all research data and findings related to that faculty. The specific search engine of the university can be placed in this section. Links to research questionnaires, latest results and statistics, research reports and analytical reports can all be placed in this section. In this way, the visitors of the website can conveniently fill-in the questionnaires and study the latest results. An entry point for research applicants can be provided in this section so that whenever the need arises, the questionnaires can be scanned and the right researchers are selected.

Advantages of electronic education in Engineering

It is a known fact that today all engineers is under great pressures to become familiar and conversant with the latest technologies and electronic business and commerce. Peter F. Drucker said to the Spectrum periodical "… engineers tell me that every two years, they need to pass a specialized course in their field of specialization, and every four years, and they have to refresh themselves with the basic and fundamental issues."

A major problem is that a majority of the MS and PhD students are reluctant to regularly attend their scheduled classrooms. This is mainly due to their engagement in a company outside the university and therefore, they find little time to attend the classes. This situation is detrimental to their career, higher learning and even their family affairs, because they have to sacrifice their time at home to complete their unfinished tasks and duties in the office and university. Long distances and traffic jams are also harmful to them. Virtual University has greatly solved this problem by moving all their needs to wherever they are.

Major businesses that expand their branches in various cities in different countries are also faced with the problems of training their staff employees in all these scattered places. That is why businesses have welcomed the virtual university solution.

Next we discuss the components of the distance learning and electronic education.

Components of the web-based distance learning and comparison with the classical methods of learning

The main topics and components of the distance learning are presented as follows:
- Web-based education (other media such as CD and DVD are complementary tools)
- Virtual Events, that can take place in a virtual classroom or virtual hall
- Consultation, including teacher/student consultations, inter-departmental communications, and exchange of views with others via email
- Simulation and graphical representation of dynamic systems (such as Java Applets) are a significant part of the Virtual University.
- Work-Groups, for collective efforts in solving problems or group discussions in forums
- Evaluation, for initial selection of the students and for skipping the parts that they are already well versed in.
- Electronic Store, An electronic store thru which all needed services are reserved in and all payments are made.
- Administration of Education, This subsystem registers the applicants, records the specifics of all students and traces their progress in all avenues of learning. It also

monitors the instructors' contributions and activities, and provides facilities for the web-master to locate the users.

Multimedia facilities for Education

If we consider education as one of the most important pillars of cultural, economical and social development, then the important role of multimedia becomes apparent. Using the numerous functionalities of the multimedia, we can port education to the remotest parts of the country.
Content-wise, these educational efforts can be customized general education of the various target groups. By harmonizing the communication networks and the multimedia networks, the highest standards of education can be propagated in all of its various dimensions. Educational CD media, communication with the educational centers, and quick access to scientific libraries, references and resources can greatly assist the distance learning and virtual university [6].

It is interesting to note that: a study showed that out of 11600 items

- 1060 items are learnt by reading
- 2060 items are learnt by hearing
- 3060 items are learnt by seeing
- 5060 items are learnt by seeing and hearing
- 7060 items are learnt by doing
- 9560 items are learnt by teaching to others

Table 9 – Comparison Table of Classical Versus Modern Methods

Classical Methods of Education	Electronic Education
Before you leave your work to participate in an educational program, your supervisor calls you to inform you of the importance of this program and the company's expectations from your new training and skills	You receive an email from the distance learning web master
You attend the course, with significant overhead costs, time, stress and the inconveniencies of traveling to and fro the training center	You follow electronic training at home or on your free times at work
Your colleagues know that you are absent for attending a training program and they should undertake parts of your responsibilities	Nobody knows that you are taking an educational course
On your returning home, everybody asks you about the course contents, participants,… and what you have learnt	Even at home, nobody is aware of your taking a course
You start learning along with some others and have group discussions	You study and learn individually, though you can partake in chat rooms or group forums
Finally you receive a certificate of attendance and successful completion of the program	Finally you receive another email

Distance Learning Classes

Like traditional courses, the structure of electronic courses consists of various parts. These courses are of 12 to 15 or even 16 weeks. The instructor determines the requirements of the course at the beginning. For example he may determine the method of teaching and delivery time for exercises and the project's final report.

Normally, each course has its own web-page whereby the instructor informs the students of the course specifics, lecture texts, exercises, and supplementary audio-visual objects. From an educational point of view, the functioning of web as a huge and freely accessible archive is its dominant advantage over the classic methods, because many students can enjoy asynchronous learning, as they can access their desired web-page at any time, before going to work, during lunch hour, or late at night. Exceptionally, for some live lectures, or conferring with their classmates, they may have to access the system at a predetermined time. Sometimes it is required that all students convene just for the first session within the university premises, so that they can see and talk to the professor and cross-talk with their classmates. But thenceforward, the learners never need to meet each other although they may have plenty of on-line encounters. They can use the online facilities for delivery of their homework, asking questions; express their views on the subject matter of the course. The instructor can divide the students into several subgroups that although they do not meet each other, nevertheless they collectively work on a specific part of a large project.

This grouping and collaboration has great pedagogical values and greatly helps the students in advancing their understanding and insight.[7]

Reasons for using Distance Learning, differences between the classic and modern methods, and comparison of some cases

Studies have shown that there is not much difference between the results of the classical method and the distance learning, except that in some cases electronic education is superior to classical method. For example, the results obtained in the Stanford University researches have shown that the performance of the engineers of Hewlett-Packard (HP) that had seen the video taped lectures and then participated in a free and informal discussion was higher than those who attended the live lectures. The underlying reason was that the HP engineers had their own analysis of the subject while the others passively received the presented information, without their own active processing of the input information.

Another advantage of electronic learning is the support of learners in their duties and undertakings. This support is in the form of supplying further information, that empowers them to make decisions on the basis of the received information, the educational program, and their own skills and experiences, thereby fulfill their duties in a more efficient manner. This is called the support of the organizational role, and part of the general planning of the companies in support of their employed role.

Another advantage of the electronic learning is the possibility of its dissemination among a very large and sparse population. Another advantage is the uniformity of presentations in various repetitions of the program. It is always possible to utilize the knowledge and experience of the best experts for any specific program. Thenceforward, the learners are exposed to this superior and complete program while in the classical method, there is no guaranteed completeness and uniformity of a program in its repetitions. Besides, in the

classical method, the instructor has his limitations in the number and places of conducting a program while the electronic education can be repeated without any limitation. [8]

Advantages of the Distance Learning Environments- a Comparison of Classical and Modern Methods

The advantages of distance learning could be classified as:

Modern Methods (Distance Learning)

- Substitution of teaching by learning
- Cost Reduction
- Environmental considerations
- Continuous supervision and lifting of all barriers
- Flexibility
- Downsizing of the organization
- Increased power of supervision and management
- Liberation of instructors' time for their further research and studies
- Accessing unlimited data and information sources

Classical Methods

- Statically traditional education
- Overhead costs and capital costs for buildings, personnel and the support services
- Environmental pollution due to heating, waste disposal … etc.
- Greatly oversized organizations and administrative functions
- Shortcomings of supervision, command and control due to lack of proper means and methods
- Very limited Accessibility of sources of data and information

It seems that distance learning can be applied to all branches of learning.

Firstly, the learner should have access to computer. Then he can pursue learning in a variety of methods. He can have the CD or DVD for all lectures, and supplementary audio/video presentations, simulations, graphics and animations. An important point to consider is that the students learn a lot from other students. If the learner suffices to the material that he receives from the CD or DVD on his personal computer, then his inputs are limited. Now many companies have concluded that setting up a network can help the learners learn from each other, too. This networking scheme can be considered at a national scale, too, as it helps all. Electronic learning provides the motive force for information exchange.

An investigation of applying the distance learning in all branches of scientific studies seems to be a good idea. Application of distance learning is feasible in all fields of study. However we like to present our recommendations only cautiously. Our advice is to utilize electronic learning as one of the components of the total and complete educational system.

Electronic education is a component for providing educational services at a larger scale, a better quality and lower costs. We believe that the modern and classic methods need to be integrated in order to achieve the following:

- Generalization of learning for all via individuals participation in specialized programs
- Standardization of academic lectures and presentations in a redesign of course materials and criteria for selective and elective courses; with the objective of responding to the needs of industries and economy, and the demand of human resources for better skills and higher qualities with deeper scientific substantiation.
- Cost reduction in conducting of and participating in the courses
- Virtual conferences, forums and symposiums
- Participation of large groups of people in educational programs, thereby upgrading the scientific and technological awareness of the population and its subsets
- Better utilization of computers in education
- Economy in management of the schools
- Generalization of searching and browsing at electronic speeds

Electronic Education in strategic industries (Oil, Gas and Power)

As a typical example, consider the oil, gas and petrochemical industries wherein electronic education is quite feasible. These industries rely significantly on simulations for training and development of specialists for operations and control of industrial complexes. This is also true in aviation industries where pilots training are mostly done by flight simulators[9].

In the energy sector of oil and gas, there are many independent operating companies with their specialized knowledge and resources. The energy industry can greatly benefit from availability of distance learning that integrates these separate companies.

Safety of operation is of prime importance in the power and energy sector that is naturally very dense with all sorts of hazards, including explosions, suffocation, fire … etc. Distance learning, electronic education and simulations can be utilized to upgrade the knowledge and skills of the operators of these industries. Simulations have a distinct advantage that if the learner makes mistakes, no serious damages will occur. Such trainings can, for example, prepare roughnecks to work on drilling rigs, with a high degree of reliability and assurance of their preparatory training.

Challenges that face electronic Education

For many of the learners, electronic education is not their customary mode of learning and requires a higher level of English language and computer skills. Many instructors are of the opinion that the learners, by physical presence in the atmosphere of the university can gain the qualities that are totally absent in distance learning.

Another point is the amount of time that the instructor should allocate for answering to the questions of a very large number of students. Already, they have limited time for study, research and meetings, and the panorama of spending a lot of time for answering to the questions of the learners is not attractive at all.
Besides, the initial costs of setting up a distance learning system are quite high and a major portion of the institute should be spent on capital assets that depreciate quickly.

The learners' budget for participation in a distance learning program is also one of the key issues. The value of time that he saves should offset the costs of buying a computer and paying for ISP services and telephone company's bills.

Table 10 – Some Web-Based Engineering Programs offered in USA

University	Program
Berkeley at California	Computer-based Information Systems, Long-distance communications, eCommerce, Geographical Information Systems
Georgia Tech, Atlanta	Digital Signal Processing, Mechanical Engineering
Kansas State Univ	Software Engineering
Stanford Univ, California	Artificial Intelligence, Fiber Optics, Wireless Communications
Wisconsin University	Engineering Economy

Despite all advantages of distance learning, there are serious challenges, too. Technology is changing continuously. Competition is getting tougher each day. Product life cycles are getting shorter and shorter. The time span for marketing and selling a product is also shrinking. Electronic Education should live with these parameters and adapt itself to their changes [10].

Motivation is yet another important challenge. As an example, in the design of a telephone exchange center, the system should be designed with regards to serving the farthest users. This is the bottleneck or the critical path of the design. The providers of electronic education are similarly faced with a bottleneck and critical path. Their farthest distance is the distance between the computer monitor and the brain of the learner and it should be shortened and connected by an effective motivation. Without such motivation, the whole chain will fail.

The organizations that see electronic education as measure for cost reduction, and fail to motivate their human resource, will not be successful.

Electronic education may not be successful in every case. Some people can not learn outside a formal and traditional classroom

Naturally, many factor influence the motivation of the employees, including: quality of the presentations and course materials, condensation level, learners' background and culture, technological level... etc.

Some other challenges that organization face in their implementation of distance learning are that in many areas, the Internet services are not yet available. The costs of cabling and maintenance of Internet lines is rather high. Therefore many organizations prefer to wait for availability of wireless systems of communication so as to avoid additional costs. The cost of computers and networks is also loaded with burden. Only newer technologies can reduce these prohibitive costs, but the overall trend for development of computer networks is hopeful.

Topics in Educational Contents, a Fundamental Issue

Thanks to their age, structure and their legacy systems, the traditional universities prepare and revise their curriculums by such existing mechanisms as various faculties, study-groups, etc. But virtual university should start this afresh. Despite this difficulty, it enjoys the total freedom of defining the contents and the forms of the curriculum.

In this direction, the important complexity that faces virtual university is its dependence on curriculum authors and developers that are members of traditional universities or employees of some private companies. These authors have their own preferences and policies in preparation of curriculum. Some questions that stem from this situation are as follows:

Q1: What and how is the detailed curriculum of a virtual university and what are the differences with the curricula of the traditional universities?

Q2: How are the modern views on education reflected on the Virtual University curricula, planning and execution?

Q3: In case new structures are available or feasible to replace the faculties, study-groups, and various committees, then what are the mechanisms that ensure maximum flexibility in educational services and how do they operate?

Q4: How does the virtual university respond to the challenges of "content preparation" that is considered as the main product and output of the academic universities?

The dependence of Virtual University on the traditional universities and private educational institutions spawns further complexities that can be summarized in the following questions:

Q5: How does the revision of contents that originates from the preferences of the authors affect the capability of virtual university in absorbing students?

Q6: How would the authorities react in view of the above causes and effects?

Q7: What are the effects of a modified content on the revenues of the virtual university, as its main guarantee of survival?

Although many authentic reports confirm the advantages of modern approaches and distributed learning over and above the traditional systems of education, there exist several other reports that there is no significant difference between these two systems. Some conservative professors even question the correctness and appropriateness of the modern approaches.

Q8: What is the position and role of the virtual university in the discussions and discourses about quality of technology-based education?

Q9: To what extent is the concept of distributed learning valid and reliable?

The virtual university untiringly insists on the qualities of education. In fact these qualities of education are the factors that place the virtual university in a competitive position against the traditional education.

Any factor that undermines the quality of education in the eyes of the students can eventually disrupt the virtual university.

Q10: what are the technical standards of the virtual university?
Q11: What are the educational standards of the virtual university?

Some Economic Issues

Virtual university can be considered as a first real and serious response to the rising costs of higher education. The rising costs of higher education in all countries, and the governments' tendency to gradually avoid the budgeting of higher education can be viewed from two different angles:

- From the viewpoints of the educational organizations and authorities(in universities and higher learning institutes)
- From the viewpoint of the learners and students

Q12: Can the virtual universities realize the hopes for cost reduction in higher education? Despite the very attractive financial calculations that support the virtual university on paper, many more reliable information, statistics documents and proofs are needed to witness and support the profitability of distributed learning in mass scales.

Q13: How can a virtual university prepare a financial strategy to guarantee its continued operation? The importance of this question is more visible for a viable virtual university that is not born from and fed by a traditional university.

Q14: Can a combination of the academic curricula and the offerings of the private institutions be considered as a successful model for the operation of a profitable virtual university?

Virtual universities are mainly looking for sources and companies that can reinforce the university in various dimensions. Virtual universities seek joint ventures with the following types of companies:

    1 – Publishers of the online books
    2 – Companies in Information and communication technology
    3- The private sector companies those are active in education.

This gives rise to the following questions:

    Q15- Can such joint ventures and associations with the private sector strengthen the educational goals and objectives?

    Q16: Do such partnerships and ventures give birth to new clusters of companies and educational groups or they limit and monopolize the trade?

    Q17: Does the prospect of partnership in such new companies persuade the university professors to positively cooperate with the virtual university?

The educational staff of the virtual university takes shape in the background of technology and matures in the same background. In between, many sundry activities get crystallized such as the web-page design, operation of the educational programs, etc. A detailed analysis of the applications of technology in a society can answer the following questions[11]:

Q18: What parts, levels, and facets of the modern technology should and could be implemented in the virtual university?

Q19: What technologies can be chosen for implementation, and what are the dictations of the technologies that are used by the learners?

The answers to the Q18 and Q19 are probably the greatest challenges that face the virtual university. A reasonable solution may be the use of a combination of the traditional and modern methods for the first few years so that everybody gets a fair chance to adapt and adjust to the new technologies and different environment that they create.

Q20: What mix of the traditional and modern methods is feasible and optimal? The following table summarizes the advantages of the electronic education in comparison with the classroom education.

References

[1]   http://www.geohive.com/2006 (retrieved Feb 2006)
[2]   Alpert, M.S., De Sonne, M.L., DBS: The Time is Now, National Association of Broadcasters, Washington, D.C., USA, 2002
[3]   Nick Farnes, "Strategies for Designing University's", International Centre for Distance Learning (ICDL), http://www-icdl.open.ac.uk/1999
[4]   Paulette Robinson, "Strategies for Designing Instruction in Web-based Computer Conferencing Environments", University of Maryland College Park, 1998
[5]   Farnes N.C. "Evaluation of an Online Education and Training Course", Report for JANU/DETA University, Milton Keynes, 1993
[6]   WebCT: http://www.webct.com/
[7]   Top Class: http://www.west.ic/
[8]   Shaik, N. (Summer 2005). Marketing Distance Learning Programs & Courses: A Relationship Marketing Strategy, Online Journal of Distance Learning Administration, 8(2)
[9]   Distance Learning Resource Network: http://www.wested.org/tie/dlrn/
[10] United States Distance Learning Association: http://www.usdla.org/
[11] The Web-based Training Info Center: http://www. Webbasedtraining.com/

Biographic Information

RAMIN SADEGHI is senior project scientist technology Group, Center of Modern Training Technology in Power and Water University of Technology; he is a member of USA-IOWHE e-council. He is also director of Web Base Distance Learning Center in PWUT.

SAEID MOSLEHPOUR is an Assistant Professor in the Electrical and Computer Engineering Department in the College of Engineering, Technology, and Architecture at the

University of Hartford. He holds PhD from Iowa State University and BS MS and EdSp degrees from Central Missouri State University. His areas of interest are logic design, CPLDs, FPGAs and distance learning.