Comparing Elements of Electronic Curriculum and In-Person Training

Golnoosh Mirsaidi, Islamic Azad University, Tehran Medical Sciences Branch, Iran
Hadi Barati, Islamic Azad University, Tehran Medical Sciences Branch, Iran

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Abstract

Introduction: Today, the doubling rate of science, the utilization of new technologies, and consequently, the increased need for education and the resulting increased costs have prompted educational organizations and institutions to implement new educational solutions. E-learning is one of these solutions. The characteristics of an e-learning curriculum were compared to those of a conventional education curriculum using Francis Klein's model.

Methods: This research used a qualitative approach. Data were collected through structured interviews with 20 university professors using the purposive and convenience sampling method and were examined and analyzed using the qualitative methods.

Findings: Results showed that in the process of developing an e-learning curriculum, formulation of the curriculum objectives, content selection and organization, determining the learning activities, learners' groupings, and assessment methods were not addressed, and conventional education had a more favorable condition regarding these factors. However, e-learning curriculum had a more favorable condition in the factors of time, location, teaching strategy selection, and materials and resources.

Conclusion: Since a systemic approach is integral to the success of a curriculum, it is essential that the factor that ranked lower in this study be considered in redesigning the e-learning curriculums.

Keywords: Curriculum, e-learning curriculum, conventional education, Klein's model.

Introduction

Rapid, significant developments in information and communication technology (ICT) have influenced various fields in industry, agriculture, and services, as well as human resources education and training. Therefore, ICT has grown to be an integral part of the workplaces and classrooms, and business practices have altered communication and learning.

The art and science of education has integrated with the growth in ICT and created a new approach known as e-learning (Aury, 2005). Computer-based instruction, computer-assisted instruction, web-based instruction, web-based training, web-based learning, online learning, virtual learning, and other similar concepts, with all their slight or significant differences, are all concepts that appear in educational systems in the current decade. These concepts are all subsets of e-learning (Allen, 2006).

King, Young, Drivere-Richmond & Schrader (2001) argued that there is a difference between e-learning and electronic instruction, i.e., e-learning is wider than electronic instruction which is limited to the instructor and learner. Several definitions have been proposed for e-learning; however, e-learning is generally known as the approach to curriculum planning, in which computer and Internet tools are utilized in addition to the learner-oriented techniques (Singh, 2003).

With the introduction of ICT, higher education systems faced multiple challenges worldwide. Efficiency and effectiveness of higher education in various countries has been affected by the infrastructural viewpoint of epistemology on knowledge-building on the one hand, and application of convergent technologies in the world and the globalization as well as the need for addressing sustainable development of countries on the other hand. During the past centuries, universities have had a traditional view on knowledge and have developed curriculums in a way that knowledge has been considered due to its nature. According to this viewpoint, the need to incorporate the educational concepts and contents in curriculums existed merely in the framework of knowledge transfer to students (Bazargan, 2007).

However, thanks to the recent developments, the practical value and application of knowledge have also been addressed, and there has been an emerging view which should be considered in developing a curriculum. In addition, the applications of convergent technologies, such as bio-technology, nanotechnology, ICT, and cognitive sciences have increasingly changed the expectations of universities in the process of globalization.

This global culture has inadvertently influenced the development in countries and has challenged the universities at the dawn of the third millennium. Therefore, over the past two decades and in most countries around the world, there has been a special sensitivity towards aligning the curriculums of higher education with the developmental needs and higher education programs quality improvement. This has necessitated evaluating the quality of universities and other higher education institutes in most countries (Thomas, 2004).

The social evolutions of the recent century have made the interest in global education almost universal and inclusive as it is an effective factor in exploiting previous knowledge, increasing knowledge, and creating skills necessary for people to live better. Today, most experts believe that one of the factors in the development of any society is providing public education. However, given the increasing population, most

countries are faced with shortage of qualified teaching staff, the need for face-to-face communication between teacher and student, the need to increase the educational space, and the limited capacity of conventional educational systems. These countries are not able to provide public education using the conventional educational systems. Therefore, e-learning system is a tool which can provide public education (Akhondi, 1996). Kahen (2001) argues that although presenting the higher education courses electronically is promising, it is viewed rather cynically compared to other educational methods of the 21st century. Quantitative development of e-learning, as a new method of distance learning, has faced with many challenges such as students' learning, teachers' teaching methods, planning, and management evaluation methods. Some of the challenges are exclusive to developing countries, and some are common concerns in all countries. Additionally, academic failure in distance education is yet another challenge facing e-learning (Rekkedal *et al.*, 2003).

The available statistics show that academic failures in e-learning are approximately between 18% and 54% which is much higher than the conventional educational (Park and Choi, 2009). Literature shows multiple factors namely infrastructural, networking, cultural, psychological, and social factors are the underlying factors of success or failure of e-learning. However, the most influential factor is curriculum design. Today in Iran, there are numerous universities that offer e-learning as a complementary training.

In the early 2000s, many universities have entered this field, and there are now more than 20 universities and higher education institutes offering such services. The history of e-learning dates back to two decades ago in the world and one decade ago in Iran's higher education. One of the main, common challenges is students' dropouts and academic failure. High academic failure rate in countries having best technological infrastructures has received academic interest as a fundamental issue.

Doherty (2006) stated that academic failure rate is higher in e-learning compared to conventional education. Different rates have been reported; however, a 32% academic failure in e-learning is widely cited. Although academic failure is natural in both conventional and electronic education, when it increases, it becomes one of the biggest problems in the educational institution and a reason for their inefficiency. This leads to the loss of customers and the bankruptcy of the educational institution in a competitive market. In newly founded systems, such as e-learning, this problem would undermine the entire system and their universal acceptance as a form of education.

An educational system, as an objective phenomenon, has both quantitative and qualitative dimensions. Its balanced growth requires both qualitative and quantitative growth parallel to each other. Growth of an educational system while neglecting quality issues inhibits creativity eventually causing loss of human and financial resources (Ghourchian, 1994).

Given the development of e-learning in Iran and the allocation of millions of dollars to it, lack of knowledge about strengths and weaknesses of existing programs and curricula and not attempting to manage the neglected aspects of the curricula cause the loss of people's material and spiritual capital and will result only in a waste of time and energy. Daniel (2006) stated that various aspects should be considered in the e-learning quality evaluation. The most important factors are the educational

pedagogy, curricula, learning materials, learning support services, and learners' evaluation system.

The present study focused on evaluating the quality of these two educational systems based on the curriculums, and the comparisons were performed only regarding this dimension. Researchers have always faced with the problem of evaluating the curricula as the effectiveness of educational programs (i.e. the changes created in learners) cannot be measured precisely. Researchers have always faced challenges in evaluating the curriculums and teaching plans. However, researchers and planners have attempted to minimize this uncertainty by developing several models (Taghipour-Zahir, 2006).

Several models have been developed to assess curriculums such as Akker model, Eisner model, Ash model, Hilda Taba model, Feyersien model, Decker Walker model, and Klein model. Each model has a specific method regarding assessment approaches and objectives. The present research is based on the Klein model which was presented in 1986 and comprehensively evaluates a curriculum as a whole. The model consists of three views of curriculum, curriculum elements, and the quality of the curriculum. The focus of this research was on curriculum (9 curriculum elements), and electronic and conventional education curriculums were compared accordingly.

Several studies in Iran (Hormozi, 1994; Akhondi, 1997; Pashaei, 2005) and other societies (Gumundsdottiri, 2003; Kanwar and Koul, 2007; Parker, 2007; Rossi, 2011) were conducted which addressed and evaluated particular aspects of electronic and conventional education curriculums while neglecting some main elements of curriculums. The main question of this study was what differences exist between the elements of the electronic and conventional curriculum based on the professors' views according to the nine elements of the Klein's model (objectives, content, materials and learning resources, teaching strategies, learning activities, grouping, location, time, and evaluation) in universities.

Materials and Methods

This qualitative research was conducted using content analysis in the University of Medical Sciences, Islamic Azad University, Payame Noor University, University of Applied Science and Technology during an eight-month period. Data were collected through unstructured interviews with 20 professors of the universities who had at least three years of teaching experience with modern technologies and had a thorough knowledge of these technologies and methods.

In other words, purposive and convenience sampling was used to select professors who were more competent to respond to questions regarding both theoretical and practical aspects. Books, articles, and documents available in libraries, literature, and the Internet were studied using the documentary method, and the Delphi method was used to examine the professors' responses. At first, the professors' entire opinions were collected using semi-structured interviews.

The approval and rejection of these predictions and their generalizability (external validity) were re-examined. The Delphi method was used because evaluations can be performed both qualitatively and quantitatively, and the Delphi method has both quantitative and qualitative characteristics. Because it is based on first-hand data, and also, quantitative analyses can be conducted on the data. On the other hand, the

Delphi method can be used to collect ideas and facilitate consensus among those who share a particular knowledge and are not necessarily in a direct confrontation, and, therefore, collective judgment of experts regarding a particular issue can be presented.

Data collection was conducted using longitudinal panel study. Twenty eligible individuals were selected as Delphi members, and interviews were conducted in a three-month period. Each interview was recorded and written word by word and coded manually as soon as possible. Interviews were continued until data saturation and lack of new information. The interview questions were initially in-depth and unstructured, and after that, they were unstructured and open-ended. Duration of each interview was 35-55 minutes depending on the flow and condition of the interview.

Twenty interviews were conducted at two stages. Responsive validity method was used to obtain validity and credibility. Modification comments were used to compare the researcher's understandings with what was actually meant by the professors. Another solution for obtaining validity and credibility was the control by experts where a researcher and an experienced professor in the field of qualitative research reviewed and examined different aspects of the study. After the face-to-face interviews, the main ideas of professors in response to the research questions were extracted using content analysis, deduction, and induction techniques, and 38 ideas were determined.

Once the median and quartiles were calculated, the position of each professor in the overall responses was communicated to them in order for them to adjust their comments to reduce the distance from median and move away from the first to fourth quartiles to achieve a consensus. Hence, the extracted ideas were presented to the professors through a questionnaire, and they were asked to comment on the strengths and weaknesses of the 34 ideas. At the next stage, the professors' comments were examined, and 14 ideas were excluded based on the strengths and weaknesses. After being modified, 20 ideas were presented to professors in the form of a questionnaire.

They were asked to evaluate the ideas and score them on a 0-5 basis. Results were classified based on Klein's model, and the elements of electronic and conventional curriculums were compared accordingly. Data analysis was conducted using comparisons which were constant and concurrent with data collection. The text of each interview was read several times and after breaking the text, the contents or themes, as the smallest meaningful constituent elements, were extracted, coded, and classified. In the end, the common ideas were identified after determining quartiles, frequency tables, and descriptive statistics, and using professors' consensus, the elements e-learning and conventional curriculums were evaluated based on the Klein's model.

Findings

Table 1. Frequency distribution of the studied sample by university

University	Frequency	Percent	Density Percent
University of Medical Sciences	6	30	30
Islamic Azad University	3	15	45
Payam-e Noor University	6	30	75
University of Applied Science and Technology	5	25	100
Total	20	100	-

As seen in Table 1, 30% of the University of Medical Sciences professors, 15% of the Islamic Azad University professors, 6% of the Payam-e Noor University professors, and 25% of the University of Applied Science and Technology professors participated in the study. Interviews were studied and analyzed to examine the differences between e-learning and conventional learning curriculums

Question: In your opinion, what is the difference between the elements of e-learning and conventional learning curriculums?

Results from individual, and sometimes paired interviews showed 34 differences expressed between the elements of e-learning and conventional learning curriculums which are as follows:

Clear expression, knowledge expressions, expected skills and attitudes, suitability to learners' needs and interests, suitability to modern scientific findings, strengthening mental processes, longitudinal and latitudinal relationship of the content, ability to increase awareness of the culture of society, economic issues and developments in the job market, creation of multiple learning opportunities, suitability to the purpose of sections and chapters, considering the scientific structure of the discipline, research and translation, classroom conferences, content analysis, teaching methods, promoting creativity and innovation regarding the subject, professors' proficiency in the subjects, methods being suitable to topics, access to the library and its resources, sources of information related to the content, access to the Internet and new resources, teamwork, creating active learning and research groups, educational environment and atmosphere, the use of computer, book contents proportionate to the semester duration, allocating time for students to ask their problems, weekdays, continuous evaluation, suitability to pre-determined objectives, diagnostic evaluation, evaluation methods proportionate to the content, addressing problem analysis, and offering solutions.

At the second stage and after the identification of the above elements, the professors were informed about the elements and were asked to have a second interview to comment on each element. Sixteen professors agreed to do so, and interviews were carried out. Fourteen elements were excluded. The results are as follows: clarity in stating objectives, content proportionate to learners' needs and interests, scientific findings, longitudinal and latitudinal relationship of content, ability to increase

awareness regarding the culture of society, creation of multiple learning opportunities, suitable book objectives, class conferences and content analysis, teaching methods, methods proportionate to topics, access to the Internet and resources, teamwork, social development of students, varied and attractive educational environment, book contents proportionate to semester duration, evaluation methods proportionate to the course content, diagnosis evaluation, considering high levels of cognitive learning, flexibility, and individual differences.

At the third stage, the obtained data were classified according to the Klein's model and were announced to the professors (Table 2). They were asked to comment based on the nine Klein's elements and the extracted factors regarding the electronic and conventional education curriculums and to determine its utility.

Table 2. Comparison between the elements of electronic and conventional education curriculums based on the Klein's model

Elements of curriculum based on the Klein's model	Agreed components	Status	
		Electronic	Conventional
Curriculum objectives development	Clarity in stating objectives	-	+
Selecting and organizing the content	Content proportionate to learners' needs and interests, proportionate to scientific findings, longitudinal and latitudinal relationship of content, proportionate to teaching objectives	-	+
Determination of learning activities	Creating multiple learning opportunities, classroom conferences, and contents analysis	-	+
Selecting teaching strategies	Active teaching methods, methods proportionate to subjects	+	-
Materials and Resources	Access to the Internet and new resources	+	-
Grouping	Teamwork, social development	-	+
Location	Diverse and attractive learning environment, flexibility	+	-
Time	Book content proportionate to semester duration, flexibility	+	-
Evaluation	Evaluation methods suitable to course content, diagnostic assessment, high levels of cognitive learning	-	+

Table 2 shows that curriculum objective design, content selection and organization, learning activities determination, learners' groupings, and assessment practices were neglected in developing an e-learning curriculum; however, e-learning curriculum had a more desirable condition regarding the elements of time, location, teaching strategies, and materials and resources.

Conclusion

Academic systems always strive to achieve education and research quality. Significant efforts have been made regarding continuous qualitative improvement in higher education in the recent years in many countries. An educational system has quality only if it is free of any shortcomings as the shortcomings in the system are its flaws and imperfections which would deprive the system of achieving the desired results. Therefore, detection is the first step in eliminating the shortcomings and flaws in a system. A correct detection includes improvements in educational plans.

The requirement of a correct detection is to utilize evaluation models to correctly judge the constituent condition and improve it. Thus, since a systemic view is essential to the success of a curriculum, it is necessary to address the elements which had an undesirable condition (curriculum objectives development, content selection and organization, learning activity determination, grouping and evaluation) in redesigning the e-learning curriculum in order to enhance their efficiency and effectiveness. Results also showed that although a huge amount of budget is spent annually on e-learning, and it has been considered to be a necessity in the Fourth Development Plan, it has not succeeded to be an effective alternative to conventional education which necessitates further research.

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