A COMPARATIVE STUDY OF INFORMATION TECHNOLOGY IN THE IRANIAN'S CURRICULUM AND SOLUTIONS TO ENHANCE IT BASED ON THE EXPERIENCE OF OTHER COUNTRIES

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ABSTRACT

Nowadays which is the era of change from industrial society to post-industrial society, has been dubbed information society, it is natural that information, knowledge are reckoned as basic assets to human societies. Development of information and communication technology (IT) in today's society is so fast that the amount of attention to it is considered as an important indicator of the level of development for developing countries, and that the present age would be a different world which the information technology will lead it. An important feature that the phenomenon of information technology has is that it makes the relationship between man and man and man and environment to be facilitated and improved. Due to the transformation power of information technology and its great influence in the educational, cultural, economic, national security, globalization development and adjustment of problems for traditional information, it is considered as one of the most dynamic and controversial fields of science and technology. This paper deals with the study of information technology and curricula in Iran. Well as with the study results of other countries of information technology, some solutions have been provided. The results indicate that, first, in science content has not been changed consistent with the development of science and technology. Methods of evaluating the science have not been changed completely and qualitative assays and development of science education in our country do not run well. Since educational programs and curriculum are not according to the needs, and understanding of the current situation in our country, thus the output of the educational system does not comply with community requirements. Also due to lack of addressing practical activities, experiments and learning based on a process approach in schools, the goals, skills and attitudes of students in the department are weak.

Keywords: Comparative Studies, Science Education Standards, Curriculum

INTRODUCTION

In recent decades, the world's attitude about the process of teaching - learning has to been completely changed. The emergence of information technology, have accelerated the transformation of the world in the age of information and intelligence. Although this phenomenon began in the military environment and then went to university centers, but today different spheres of life in communities are affected. Now, it is nearly two decades that IT education have entered in the field of education and training systems and has also challenged the and educational environments and system . The educational system of our country is no exception. Although a very small amount of this technology has been used in different parts of our educational system, But now it is time that our educational system in tandem with other countries to make fundamental changes both to stay with this accelerating convoy and also use the benefits of the information age (Kiasi, 2007)

Major phenomena such as the explosion of information and increasing technology and its influence in all aspects of human life, recent advances made in the education methods and promoting science education have shown that with respect to time, all students should be prepared for living in a complex society and today's advanced scientific closely related to technological issues (Strong *et al.,* 2004).

Among the consequence of entering the information and communication technology into our lives, the emergence of concepts and terms such as information society, information age and economy can be noted. On the other hand it must be admitted that a great revolution in Educational system is caused by Information and Communication Technology. In modern era education is facing new goals. New

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approaches to learn and teach have been faced with the traditional approaches. It is believed that in general the use of ICT to achieve learning goals for all of quality is inevitable.

Nowadays, to achieve a better, efficient and advanced educational system, is one of the most common objectives pursued in the world and every country plans and invests to achieve this goal with respect to the importance of education among officials and policymakers and in its society (Harlen, 1992) In almost all societies, educational issues and goals are similar to each other, but the methods and programs used for solving problems in science education, are connected to the traditions and culture of each community.

Obviously the experience of other nations will help us solve problems in various fields of education and prevent us to repeat their bitter experiences, but we should note the important point that experience and analysis is different with the blind imitation. Regarding cultural, social, historical, economic and etc. differences, these systems have uneven common problems and issues, and on this basis of studying the experience and methods of educational development and reforms of other developed countries, will improve our ability to solve the difficulties on the science and technology education system (Aqazadeh, 2000).

MATERIALS AND METHODS
Methods
Nature of ICT

Information technology is an interface that provides ability of the expression of a wide range of information, ideas, concepts, and messages. This phenomenon has a variety of definitions due to the different properties. Information technology refers to a set of tools and methods that gather, store, retrieve process and distribute information in different forms. Information technology has been developed to expand the capabilities of human thought. The term information technology can be viewed from two perspectives. The first view, the term IT is used to describe the techniques that help is of capturing, storage, processing, marketing and transportation of information. In the second perspective, information technology refers to a set of tools and methods that allow the production, processing and presentation of information to the human user. Today, the issue of education quality and effectiveness of education and training systems are the major concerns of stakeholders and decision makers in the development of any country. In our country, Iran, this has gained a double issue of concern for numerous reasons, So that the governments have hardly even paid the running costs of education over the past decade. Information and communication technology has this claim and also the ability to reduce the costs and raise the quality over a program and changes in the structure and procedures of the educational system and make the products of Educational systems consistent with the needs of the community and to take steps to make the education and training practical (Salehi and Heydari, 2007)

Growing need of people to be educated, the need to maintain the link between education and work, scarcity of qualified teachers, a lot of budget which is been spending to education, gives necessity to new low cost and high quality systems which cover a wide range in addition to economic aspects and simultaneously train a large number of learners. Information technology besides meeting the mentioned needs, prepares the opportunity to learners to learn proper at time (Farhadi, 2002). With respect to the features of the current era which the man is faced to an information explosion and technology development, the educational system is responsible to arrange the curriculums so that all cognitive abilities and personality of students grow up and enjoying and gain capabilities needed to deal with new developments by using the benefits of science and technology. But the evidence shows that most students lack this characteristic and in other words the scientific programs failed to educate the scientific probe morale, creativity and creativity in students (Parvizian, 2005).

Information technology as a new approach, acts in the complementary role of the educational system - improving the quality of teaching, diversity of teaching methods - providing ongoing automatic training - shortening training time - Shortening the period of study, attention to individual talents – Individualization of training and deal with the problems of mass education (Maleki, 2009).

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Today by having advanced and different information and communication technology, the ability to establishment of communication and rapid exchange of information is prepared faster than before. Everywhere they are, they can get their last needed information. But without a doubt - the greatest impact of information and communication technologies has been on educational environments (Esnafi and Hamidi, 2007).

The Goals of Development of Information Technology in Education system

Given the current status of the technology in our education system, the importance of long-term planning, strategic goals and mission of the comprehensive development of the technology in formal education system can be described as follows.

A - Continuous decline of the distance between student use of information technology within and outside of formal educational space and the complete transformation of the current situation and anticipating the educational consumption within the formal atmosphere of other consumer computer products, and information science.

B - Mission: To deliver continuous and finally complete resolution of the crisis of the acceptance of formal education system using information technology capabilities in order to turn the current crisis of educational and training systems into the development through changes in the learning process, learning including:

C - Changing educational environment, including training packages, textbooks and training equipment software and hardware

Changes in teaching behaviors and roles of teachers

D - Changing the educational roles and behaviors of learners, especially the collective learning (Kiasi, 2007).

Application of ICT

The educational applications range of IT is a very broad.in one side of it there exist a very limited activities which are based on traditional methods and on the other hand the basic changes in the teaching approaches. For example, some teachers use Interactive whiteboard to represent the ideas and contents in class Topics in a traditional method, while some other allow the students use this equipment to show their Plays that they themselves have designed and filmed. The studies show that the application of IT is that the teachers and software programs challenge the intelligence and minds of students and this is done if all students participate in the class discussions via interactive whiteboard or use computers individually or in doubles teams. If the teacher is able to organize the skills of students based on IT-based activities, then the individual and the classroom performance of students can be efficient alongside each (ghafari, 2009, p. 2) In 1994 a study was done in America in the field of educational software application and the following result were found:

A - Educational technology had positive and considerable effects on efficiency and functionality of students in all subjects in classrooms in all levels.

B - Application of educational technology were effective on learners that towards their hope to their academic future.

C - Number of students, efficiency educational design, effects of the role and functionality of a teacher, grouping of learners, effectiveness of learning and the quality of the learners understanding; depends on the use of technological issues in the classroom.

D - Technology Leads to the development of is student-orientation approach and requires more collaborative works in learning. Also it causes more interaction between teacher and student.

E - Changes over a period, are not felt all at once, but also are needed to result in the continuation of the use of technology in teaching-learning process.

F - Interactive video images, especially in the difficult and complex learning skills and concepts that are single are very important and have a positive effect on learning.

G - To use telecommunications facilities available on-line for team and group work showed that the use of technology in academic skills enhances teamwork.

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H - Learners, in the situation that use computer networks, cooperate and collaborate more and have more participation with each other to learn (Farzad, 2006)

Benefits and opportunities arising from the development of information technology include:

• Training of a skilled and efficient manpower. 2- Qualifying the education. 3 –Training the entrepreneurs and helping to create jobs. 4- Easy access to information resources. 5 - Reduction in training costs in the long term. 6 - Updating the administrative system and the education system. 7 - Retraining teachers to increase their knowledge and jobs skills. 8- Creating motivation and effort and innovation in curricula 9 - Reducing the gap between student skills and education services. 10 - Using international experience (Maleki, 2009).

Other advantages of technology can be seen from the following: Increasing the transmission speed of learning and efficiency, Calculating and processing information fast and instant transmission, reducing work time and thus increasing productivity. Information technology allows quick search of and access to information for students.

Increasing the Accuracy of Learning

Information technology provides and guarantees high and constant accuracy for students. In various processing and computational activities the accuracy of the computer is more than human.

Reducing the Physical Size of Info Centers

With the development of information technology and applying it, it is no longer necessary for carrying and storing large volumes of textbooks. Several books can easily be stored in the hard disc. Computer Research Center of Islamic Sciences, Qom, is among centers that has been performing this.

Preventing the Imposition of the Teacher's Personal Views

Using information technology increases transparency in doing things and many comments will be deleted. This key advantage leads to the removal of provincial fraud of the students.

Make Full-time Work Possible

By Information technology, many inquiries and referrals for students and their parents carry out through a computer network and automatically. Creating allowing remote collaboration for teachers and students, communication, telephone, teleconferencing, video conferencing and the joint systems, EDI, etc. are examples of applications of information technology in this field.

Reduce the Cost of Education

Given the above points, especially the increased speed which results more number of works to be done and the full-time work, system efficiency is increased and thus reduces the amount of expenses for government and students (Maleki, 2009).

The impact and role of information technology in education

Reviewing literature or texts development of IT curricula in recent decades in Hong Kong reveals that the aim of the IT curriculum in Hong Kong is change from Computer Studies to the development of knowledge related to information processing approaches. Previously, the IT curriculum was to provide an opportunity for students to learn the knowledge and identifying the IT tools. Currently its role is equipping students with the information literacy skills which mainly consist of the required knowledge in information processing, learning ability and the proper approaches to process information using IT. In this regard, the government mentioned to interesting themes and parameters in response to the social demand for IT and gave priority to the integration of educational models (Cheung, 2008) Based on the views of UNESCO's International Commission, in reviewing the communication problems, one of the roles and functions of ICT in society, is the issue of education which means transferring the information necessary to grow and develop ideas, build and develop character and acquire skills as well as transmission of a wide variety of messages in order to help learners to recognize, understand and appreciate each other and unite in social obligations (Aali, 2002). Among the major means through which we can achieve mental mobility, emotional oneness, arguments and confidence, is education and Information Technology in this case could have a major role. IT growth in developed and underdeveloped countries, particularly in the field of social media will lead to new opportunities for education.

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First, there is a clear and mutual relationship between information technology and education. Second, the high amount of information and its collection in specialized classes has led people significantly to access knowledge and its application. Third, radio broadcasting facilities in many countries has led to the formulation of innovative educational programs, and some formal training programs have been the complementary for school or university courses. Fourth, information technology, especially telecommunications equipment makes the quality of education raise in schools through video and audio tools. IT could educate children who do not have access to schools have been forgotten in distant rural areas (Aali, 2002).

Using technology as an educational innovation will help to enrich the learning environment, engagement of students actively, facilitating cognitive approaches, coupled and interactive learning and enrichment of the learning resources and covers disadvantages of traditional teaching methods such as lecture. The technology can eliminate the constraints of time and place and make education more public (Hosseinkhah, 2008). ICT teaches us How to change the organization how primarily to create innovation related to the environment and in competition with other organizations in order to have smart actions in contrast to the modern organizations (Levine and Vadmany, 2008).

Curriculum for Science Education in Other Countries

In many countries the use of ICT in education has been noticed in order to improve the quality of teaching - Learning methods. ICT creates a framework or structure which via improving the quality of education, Students and teachers can use technology to achieve a wide range of learning resources, increase their motivation to learn and learning to use different forms of learning (Rahmani *et al.,* 2006).

A comparative study of educational systems of successful countries in the TIMSS tests show that Most successful countries have a national curriculum and try to do the best possible way on science education based on that and statistical analysis shows that students from these countries have very high academic growth (Harlen, 1995). Preparation of standards curriculum, particularly in countries with a national curriculum document are more evident. Countries like the United States of America, Canada, Germany, England, New Zealand and etc. are the countries that have a National Curriculum and are moving towards standardizing the components of the educational program. In some of these countries instead of the standard, the word of "learning outcomes" is used. Countries like England and Australia furthermore try to define the content, determine teaching methods, evaluation methods and learning outcomes (standards) in their curriculum and in their documents they have not explicitly used the term "standard" (Middewood and Burtun, 2001).

The major goal of science education in schools is to increase scientific literacy, scientific and probe spirit, creativity, and innovation in the students. One approach that may assist the creation and progress of these objectives is using standard methods of teaching science that will lead to decreases the differences in education with developed countries.

The most important step to achieve an appropriate level of scientific literacy in each country is to develop standards for teaching science so that by implementing these standards (NRC, 1996) a kind of matching in different schools and academic promotion of community is done. Singapore which is the first rank in the TIMSS test, emphasizes on science education on the usage of "it" and in (Koh 1998) among different countries has the first place in the teaching of information technology and its application in education.

In the U.S. and UK, there is a particular attention to practical activities and curriculum based on laboratory (Nuffild Primary Science, 1997). In Asian countries, Japan and Singapore, the use of multi-media teaching equipment and instructional models and the use of computer simulations in science education have a special place (O'Donnell, 2004).

In the United States, despite the each state's science education standards, a national standard have also been developed in deciding to teach the science better (NRC, 1996). In addition to this, enormous project as the project 2061 was designed and is running well. Project 2061 which is for the American Association for the Advancement of Science (AAAS) is involved in educational reform at all levels of education from preschool to pre-university through a change in attitude, approach, designing and production of materials and tools required for a comprehensive transformation in Science, Mathematics and Technology And is

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trying to help teachers change the ideal of acquirement of scientific literacy as a national aspiration among Americans to a reality (AAAS, 1989).

In order to increase scientific literacy and to keep pace with scientific developments of the 21st century, our country also needs to match SCIENTIFIC teaching - learning process for training people with high scientific literacy and uniform distribution of scientific literacy among all citizens. To do this it is necessary to use Codified educational standards and minimize educational differences across countries (Hajj, 2001). In compilation of standards, in addition to defining the goals of educational system exactly and its needs, the demands of clients (community) and the best ways they are achieved are accurately identified and adaptability of educational system, (Strong *et al.,* 2004). Including global developments increases regarding to the changes in the periphery.

Information technology is the most important factor in the process of shaping the information society. Countries which are able to adapt to rapid changes in the world and be equipped with some features drawn from the new circumstances and also have the ability of access, production and use of new information, have been greatly succeeded, especially in the twenty-first century. The slogan "Computer for All", "Internet for all" and "electronic government" now, have attracted the attention of many institutions interested in becoming an information society (Bayer and Kysr, 2009).

Education Policies in other Countries

The educational policies of a country represent the view of officials, policymakers and educational programmers and the importance of science shows the attention to educational terms and using new approaches in teaching sciences.

Singapore's education policies are focused on human resource development and it is been trying to make the students familiar with cultural, economic and social needs and prepare the necessary workforce to meet these needs by training specific skills. Singapore is one of the few countries that has succeeded in taking basic steps to integrate ICT with training teachers and teaching students approaches (Koh, 1998)

Curriculum Objectives in other Countries

Each of the countries in science education, follow specific learning objectives. In all of them three objectives can be seen, knowledge, skills and attitudes; but the type to address these objectives is different. In terms of knowledge goals, there is not a huge difference between Iran and other countries, but in terms of achieving the goals of skills and attitudes, a significant difference is observed between Iran and other countries and low scores on international tests such as TIMSS, attested to this affair. In schools in Iran due to not addressing the practical activities, experiments and teaching process approaches, of students are weak in the skill and attitude goals (Kyamanesh and Kheyriye, 2002).

Suggestions

Despite changes and reforms conducted in primary and junior secondary curriculum in our country, these programs need to be reviewed again in terms of content and performance. TIMSS exam in 2007 was a good opportunity to evaluate the developed curriculum and review can be done according to the results of this test. Measures should be taken to both teachers during service and teachers at the beginning of their service pass specialized training courses in teaching methods and new approaches in teaching science. Effective workshops and in-service courses for teachers can improve teaching methods and evaluation and academic growth of students.

Most teacher training institutions use traditional approaches to teach science. Therefore, it is necessary to review the curriculum and the educational content of teachers training institutions and investigate the possibility of using new approaches, models, and technologies in teaching science. Equipping schools with computers and multimedia tools and ICT should be emphasized by Education officials and special funds can be considered for this purpose at a specific time.

Conclusion

As noted in the definitions of curriculum, curriculum is plan in which learning opportunities are provided to a group of learners for achieving specific general and detailed goals. It also noted that the curriculum is the major and overall design of educational activities which of course identifies the course content, expectations or demands of learners (according to need), content teaching methods, methods for

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facilitating learning, methods of evaluation of teaching and even learning activities time frame . In order to make curriculum have potential effectiveness, several factors must come together; the phenomenon of ICT has the ability to be considered not as a tool but rather as an underlying factor for change and innovation in education. However, it is essential that education and elements such as curriculum change proportional to circumstances. Using ICT Phenomena in curriculum has many advantages. Information technology allows the use of a comprehensive integrated curriculum in training learners. Increasing importance and validity of curriculum content is other benefit of using new technologies in planning the curriculum. Therefore parallel to the change of syllabus content for more ICT use, the process of creating scientific and cultural infrastructure to be implemented.

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