Original Article

An investigation of perspectives of application of information and communication technology in teaching and learning

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ABSTRACT

Aim: Information and communication technology (ICT) has the potential to enhance access, quality and effectiveness in education. The purpose of this research was the possibilities for application of ICT in teaching and learning from the perspective of faculty members and graduate students of the Islamic Azad University of Isfahan (Khorasgan) and Meimeh. **Methods:** The method of the study was descriptive and a classified sampling method suitable for the population was used. The statistical sample included 271 postgraduate students. The main instrument for collecting data was the researcher-made questionnaire including 56 close-ended questions. The reliability of the questionnaire was estimated through Cronbach-α coefficient (α =0.85), and the validity was confirmed by the related experts. The results research showed that the role of input and process of the application of ICT in teaching and learning for faculty and graduate students was lower than the average level and was not considered a prospect. **Result:** The results individual and organizational results of the application of ICT in teaching and learning for faculty and graduate students was above the average and was considered as prospects. **Conclusion:** The following are the most important perspectives from views of professors and graduate students: a variety of teaching methods, research skills, increase confidence and ability, creativity, reduce training costs and improve the quality of classroom instruction.

Key words: First: Information and communication technology, perspective, teaching and learning

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Introduction

In third millennium, with emerging information and communication technologies in the field of life, enjoying good educational systems of these technologies in teaching and learning is one of the major professional challenges in most societies. Although information and communication technologies cannot be considered as therapist for all the problems of education, but today, these technologies are an essential tool for teaching and learning. To use these tools effectively and efficiently, teachers and students need potential prospects of technology, opportunities, applications, training, support and the right equipment. In this case, the teachers and students can be regarded as conscious toward the use of new technologies.[1]

Higher education in any society is of great importance. Due to the power of technology, higher education is on the verge of a revolution. In fact, the production of knowledge in the age of information is an activity by the help of technology.[2]

Information technology (IT) has a strategic role in response to the changing needs, and it is an important factor in creating knowledge-oriented society.[3] The main motivation for developing the use of IT in education is to improve the quality of teaching and learning.[4] Development of new technologies such as computers and the Internet improve new ways to create and enhance innovative teaching methods for instructors. In other word, the variety of features and capabilities that IT provides for trainers and teachers, use to their desired activities, has caused them, due to their desired activities, to have several training options to choose from.[5] In general, given the major issues in education,

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such as educational failure, and lower-level learning, new information technologies can create new learning techniques and encourage a spirit of inquiry and analysis of learners. In addition, this technology can personalize the learning process and drive methods of teaching from teaching to learning.[6]

Application of information and communication technology (ICT) in higher education.

Now-a-days, ICT is known as an integral component of the education system.

Professors and teachers around the world know inevitable the role of ICT to increase the quality of learning and teaching process.[7] The capability and value of different levels of ICT and its impact on the strengths, weaknesses, opportunities, and learning and teaching methods are increasingly evolving and expanding.[8]

According to experts' views on changing learning from behaviorism to constructivism, it has caused students to be involved in the teaching - learning process. Traditional ideas about learning provide a limited number of facts and concepts by students.[9] While in teaching and learning approaches such as constructivism, there is particular emphasis on how to build the emerging knowledge-based efficiency, personal experiences, mental structures, and beliefs. Therefore, it can be said that learning in a new field is a student-oriented method.[10] By taking advantage of ICT especially computers, the research goals of this new field in the educational process will be satisfied. Roblyer and Edward stated that technology in general and computer-based technologies in particular is an essential part of teaching and learning that help students develop skills including critical thinking skills.[11] Therefore, attention to the rapid flow and high volume of ICT developments in the field of education requires identifying challenges and prospects associated with these technologies. This issue should be of particular interest to educational and curriculum planners in the education, especially in the realm of higher education. The field of higher education is in both directions. On one hand, it should be suitable for the adoption and development of products in secondary education; on the other hand, it should develop different scientific disciplines in the context of public construction by providing forces capable of absorbing the labor market and meet the needs of the country.[12]

Several studies have attempted to estimate the numerical value of educational productivity. One famous work belonged to Nimik Bemegel that showed the average of productivity of computer-based training is 30% and average productivity based education private tutoring is 10%.[13] Unfortunately, the calculation of the efficiency of training is not easy because it is easy to estimate the value of educational output. It is hard to decide about ICD; because heavy expenditure spent on installation, maintenance and support. But the other side of the deal is more important, and that is, if educational value of the output is zero, productivity would certainly be zero. The second logic of the use of ICT in education is that it improves technology literacy learners. In other words, the emerging conditions requires that all persons of good skills and knowledge to perform their duties effectively and efficiently in society. Finally, a third logic of the application of ICT in education is to facilitate and support teaching and learning processes and programs.

As Tam noted, ICT teaching and learning is valuable because many problems can be solved by it.[14] There are further debates about whether ICT has any the positive effect on learner? Some researchers claim that there is no direct relationship between ICT and learning because learning is influenced by the learning environment, and ICT is only one element of the learning environment. Goudarzvand, in a research on the impact of IT application on the effectiveness of the training, concluded that there are significant differences between the technical aspects of the data (including timeliness, relevancy, transmission speed, accuracy and reduced learning costs) and effectiveness of the training.[15] Azadmanesh, in research on feasibility of the application of modern ICT in curriculum of higher education, investigated three groups very important and involved of teachers, curriculum specialists and IT professionals; research findings has shown that despite the severe need of such facilities technologies in curriculum planning process (design, implementation, evaluation), there is still no adequate facilities; respondents require facilitating factors like teacher training, university and college adequate funding, access and the willingness of students to benefit from new features; it refers to the obstacles and risks in the process of applying ICT curricula including: Less familiarity of professors with the new technology, lack of proper facilities, lack of student access to ICT facilities, poor funding of universities; lack of technical infrastructure, lack of adequate security in the computer system, lack of teacher interaction with students.[12] Coake, in a research, indicated that few teachers used rich media as part of their classroom instruction and revealed that most teachers rarely make use of rich media throughout the school year. He believed that barriers of application of ICT was as the results of lack of appropriate hardware

and software facilities, lack of trained teachers, lack of technical support.[16]

Wells and Wells also, in the study about the challenges of ICT in education, showed challenges of not reaching objectives because of the lack of cultural competence, lack of corporate governance and external constraints.[17] Hadjerrouit research titled electronic learning (e-learning) in school education, represented that unlike traditional education, e-learning is based on self-study of students; that is, the focus is student-centered. ICT-based teaching methods help teachers and students adopt learner-centered approach.[18]

Along with the development of IT in higher education in the world, the technology has a place in higher education in Iran. Examples of such efforts are national conferences, seminars and specialized workshops held in this area.[19] One of the most important initiatives in this regard is scientific operation of the network supervised by the Ministry of Science and by the Iranian Research Organization for Science and Technology. The purpose of this plan is to provide a suitable platform for the exchange of information among the universities on the internet and intranet.[20] Therefore, the instructional planners must be able to provide prospects and challenges in the field of information and communication technologies in order to enhance and improve teaching and learning and try identify the challenges to strengthening and weakening prospects. Due to the use of information and communications technology to achieve the goal of teaching and learning with high quality is inevitable;[21] we should evaluate the prospects and challenges of applying to avoid blind imitation and recognition based on knowledge before applying these technologies in the field of learning. Therefore, it seems that organizational elements model is the most appropriate way to achieve such knowledge in the university environment. Connections among what organizations do are produced in the pattern of organizational elements, and the results are shown.

Five organizational elements (input, process, output, outcome and impact) can be summarized in the following three categories:

- Organizational efforts: What the organization is doing and will do
- Organizational outcomes: What the organization produces
- Social implications: Whatever that is produced in community and social returns. In this model, each element is dependent on other elements of the enterprise. Organizational efforts will lead to organizational results, and the two achieve social outcomes (consequences).[21] In this articles, the application of ICT in teaching and learning within the organizational element model is discussed that that includes organizational effort (input processes) and organizational results (individual and institutional) Islamic Azad University (Isfahan - Meimeh). The results of this study seek to answer the following research questions:

1. From the perspective of faculty members and graduate students, does the input of the application of ICT have prospects?
2. From the perspective of faculty members and graduate students, does the input of the application of ICT have prospects in teaching and learning?
3. From the perspective of faculty members and graduate students, do individual results of the application ICT in teaching and learning have prospects?
4. From the perspective of faculty members and graduate students, do Organizational consequences of ICT application have prospects in teaching and learning?
5. Is there any difference between respondents' opinions on student input, process, individual results and results based enterprise application of ICT in teaching and learning according to demographic factors?

The methods of the present study are practical purpose and descriptive – survey. The population includes 32 of faculty members and 961 MA students of (Faculty of Education) the Azad University of Khorasgan (Isfahan) and Meimeh; the sample size was calculated for 271 students. The population includes 32 of faculty members and 961 MA students of (Faculty of Education) Azad University of Khorasgan (Isfahan) and Meimeh; the sample size was calculated for 271 students [Table 1].

Sampling is commensurate with the size of on class for students and the census for teachers.

Data collection was done through questionnaire made by researchers depending on the type of answer that include 56 items in the main application of ICT. The reliability of the questionnaire was assessed by Cronbach's-α coefficient equal to 85% and its validity has been approved by the relevant experts.

Table 1: The population of faculty and students of Islamic Azad University Graduate Faculty of Education and Meimeh

Gender	Students	Faculty members
Male	487	20
Female	474	12
Total	961	32

Source: Azad University of Khorasgan and Meimeh (91-1390)

Results

First question

From the perspective of faculty members and graduate students, does the input of the application of ICT have prospects?

According to Table 2, mean scores of input of the application of ICT in teaching and learning for teachers is 2.36 and for graduate students is 2.39. Absolute value of *t* calculated from the *t* table for students is greater. Thus, input of the application of ICT in teaching and learning for faculty and graduate students is lower than the average level and the landscape is not considered.

Second question

From the perspective of faculty members and graduate students, does the input of the application of ICT have prospects in teaching and learning?

According to Table 3, mean score for the process of application of ICT in teaching and learning for teachers is 2.02 and for graduate students are 2.06. Absolute value of *t* calculated from the *t* table for students is greater. Thus, the role of ICT application process in teaching and learning for faculty and graduate students is lower than the average level and the landscape is not considered.

Third question

From the perspective of faculty members and graduate students, do individual results of the application ICT in teaching and learning have prospects?

According to Table 4, the mean scores of the individual application ICT in teaching and learning for teachers are 3.41 and for graduate students are 3.53. *t* calculated from the *t* table for students is greater. Thus the results of the application ICT in teaching and learning individual for professors and graduate students is above average and the landscape is not considered.

Fourth question

From the perspective of faculty members and graduate students, do organizational consequences of ICT application have prospects in teaching and learning?

According to Table 5, mean score for organizational results of the application of ICT in teaching and learning for teachers are 3.67 and for graduate students is 3.78. *t* calculated from the *t* table for students is greater. Thus, the role of organizational results of the application ICT in teaching and learning for faculty and graduate students is above average and the landscape is considered.

Table 2: Comparison of the mean scores of input of the application of ICT in teaching and learning from the perspective of faculty and graduate students with an hypothetical average of three

Group	Significant	Degree of freedom	*t*	Deviation from mean scores	SD	Mean
Professors	-	-	-	0.059	0.32	2.36
Students	0.001	265	−17.319	0.035	0.57	2.39

ICT: Information and communication technology, SD: Standard deviation

Table 3: Comparison of mean scores in the teaching and learning of ICT application process from the perspective of faculty and graduate students with a hypothetical average of three

Group	Significant	Degree of freedom	*t*	Deviation from mean score	SD	Mean
Professors	-	-	-	0.095	0.54	2.20
Students	0.001	271	−9.724	0.041	0.67	2.60

ICT: Information and communication technology, SD: Standard deviation

Table 4: Comparison of mean scores of the individual results of the application ICT in teaching and learning from the perspective of faculty and graduate students with an hypothetical average of three

Group	Significant	Degree of freedom	*t*	Deviation from mean	SD	Mean
Professors	-	-	-	0.068	0.37	3.41
Students	0.001	256	16.048	0.033	0.53	3.53

ICT: Information and communication technology, SD: Standard deviation

Table 5: Comparison of mean scores of organizational consequences of ICT application in teaching and learning from the perspective of faculty members and graduate students

Group	Significant	Degree of freedom	*t*	Deviation from mean	SD	Mean
Professors	-	-	-	0.057	0.32	3.67
Students	0.001	253	25.609	0.030	0.49	3.78

ICT: Information and communication technology, SD: Standard deviation

Fifth question

Is there any difference between respondents' opinions on student input, process, individual results and results based enterprise application of ICT in teaching and learning according to demographic factors?

Results listed in Table 6 show that there are significant differences in terms of degree only in variable of input. According to the mean, graduate student group (2.34) are more than doctoral students (2.22); so the difference is in favor of postgraduate students.

Table 6: Multi-way analysis of variance of scores of input of, processes, individual and organizational outcomes in students with respect to demographic characteristics (gender, education)

Sources	Variables	Square	Degree of freedom	Mean square	*F*	Significant
Gender	Input	0.415	1	0.415	1.347	0.247
	Process	0.174	1	0.174	0.406	0.525
	Individual results	0.438	1	0.438	1.466	0.227
	Organizational results	0.001	1	0.001	0.005	0.946
Educational level	Input	2.084	1	2.084	6.763	0.010
	Process	0.336	1	0.339	0.792	0.375
	Individual results	0.856	1	0.856	2.866	0.092
	Organizational results	0.035	1	0.035	0.138	0.710

Table 7 shows that the lowest mean is for the process 2.20 of professors group, and in students group, the lowest mean is for process 2.39.

Discussion

Now-a-days, ICT has impact on all aspects of individual and social. This effect is increasing rapidly. This technology is widely deployed in academic environments. The culture of its application is progressing day by day. Due to the inevitability of the application of ICT and investment required in this regard and the fact that officials and decision-makers for universities higher education has been facing with this necessities; organization's information systems, implementation area of information and communication and the leadership and management of the system should be redesigned and implemented as a study, review and redesign.

The present results indicate that the role of input of the application of ICT in teaching and learning for faculty and graduate students is lower than the mean level and is not considered a prospect. The results of this study is consistant with the rsults of studies done by Azadmanesh,[12] Coake[16] and Wiles and Bondi.[10]

Azadmanesh, in his study, found that challenges and obstacles in the application of ICT in curriculum planning process include:

1. Low familiarity with new technology
2. Lack of adequate facilities
3. Lack of access to ICT facilities for students.

The role of application of ICT in teaching and learning for faculty and graduate students, is lower than the average level and is not considered as prospects. The result of the present study was consistant with the study done by Efat Nejad[22] and Coake.[16] Coake, in his study, evaluated environmental and individual factors in teaching professors and lack of trained teachers as a major challenge for the application of ICT in teaching and learning.

Table 7: Mean and SD scores of the prospects of the application of information technology

Parameters of frequency	Students		Professors	
	SD	Mean	SD	Mean
Input	0.57	2.39	0.32	2.36
Process	0.67	2.60	0.54	2.20
Individual results	0.53	3.53	0.37	3.41
Organisational results	0.49	3.78	0.32	3.67
Total scores	0.36	3.07	0.21	2.91

SD: Standard deviation

The role of Individual results of the application of ICT in teaching and learning for faculty and graduate students is above average and is considered as prospects.

Examples of prospectss are teachers' teaching skills and research skills and increasing self-confidence and enhancing creative ability.

The results of this study is inconsistent with Giavrimis[23] research results and not consistent with Efat Nejad.[22]

Efat Nejad, in his study, was not good in cases such as the use of ICT in research activities, participation in local and overseas seminars and writing books; he considered them as challenges, while in the present study, from perspective of respondents, Individual results of teaching and learning process is able to have a good impact and be regarded as a prospect or prospects.

The role of organizational results of of the application of ICT in teaching and learning for faculty and graduate students is above average and is not considered as prospects; and according to the items, the process of teaching moves toward core activity and reduce reduced spatial and temporal constraints and is not as prospects. The results of this study is consistent with the results of study done by Mousavipour,[24] Goudarzvand,[15] Hadjerrouit.[18]

Mousavipour, in his study, considered his findings as quantitative increase of scientific productivity and increase of scientific cooperation as positive point or in other words, IT application prospects in the teaching environment.

The results of demographic factors among students about the inputs, processes, individual and organizational outcomes based on the application of ICT in teaching and learning, only in the input variable, are significantly differences in terms of educational degree.

However, given the prospects for application of research findings based on ICT in teaching and learning there is provided for officials suggestions in the following:

The preparation and equipment in learning environments in a way that best to promote confidence level, ability, creativity, research skills of students and teachers and to raise the level of learner motivation, sense of responsibility to the students and teachers.

Education system should be equipped and prepared in such way that information and communication technologies in the best way promote level of competition, the level of international cooperation, the quantitative and qualitative evaluation of development strategies taught in class, poor quality and quantity of curriculum elements, reducing the cost of education, quality of education and educational equity.

References

1. Bowes J. The emerging repertoire demanded of teachers of the prospects. Surviving the transition. [Last retrieved on 2005 May 05].
2. Monolescu D, Schifter C, Greenwood L. The distance education evolution: Issues and case studies. Inf Sci 2006;9:319-34.
3. Zuhairi A, Wahyono E, Suratinah S. The historical context, current development, and prospects challenges of distance education in indonesia. Q Rev Distance Educ 2006;1:101-95.
4. Bowles J. Thee-learning potential, 2000 Available from: http://www.Kdgonline.com. [Last accessed on 2000 Feb 06].
5. Nasiri F, Hanraads JA, Fathi Vajargah M. Feasibility of establishing virtual training system in the Ministry of Education of the country. J Educ Innov 2005;2:105-23.
6. Nejati Hosseini SM. Notification and Culture. Tehran: Publishing House of Book; 2004.
7. Jegde PO. Age and ICT-related behaviors of higher education teachers in Nigeria. Issues Inf Sci Inf Technol 2008;7:771-7.
8. Shabani H. Challenges and approaches to information age and the need for change in the structure and process of implementing the curriculum in higher education. 1st ed. Tehran: Ayij; 2004.
9. Zophen NO. Use of New Technologies in Education. 2nd ed. Tehran: SAMT; 2006.
10. Wiles J, Bondi J. Curriculum Development: A Guide to Practice. 6th ed. New York, NY: The Free Press; 2002.
11. Roblyer M, Edwards J. Integrating Educational Technology in to Technology. 2th ed. Upper Saddle River, NJ: Practice Hall; 2008.
12. Azadmanesh N. Feasibility of the Use of ICT in Higher Education Curriculum, Curriculum Planning MA Thesis, Martyr Beheshti University: Faculty of Education and Psychology; 2006.
13. Mergel B. Instructional Design and Learning Theory. Graduate Student, Educational Communications and Technology University of Saskatchewan; 2000.
14. Tam M. Constructivism, instructional design and technology implication for transforming distance learning. Educ Technol Soc 2003;3:50-60.
15. Goudarzvand M. Innovative Approach in the Journal of Educational Management, Islamic Azad University Marvdasht; 2011.
16. Coake B. Change in School: Fascinating the Process. Albany: State University of New York Press; 2006.
17. Wells R, Wells S. Challenges and opportunities in ICT education development: A Ugandan case study. Int J Educ Dev Using Inf Commun Technol (IJEDICT) 2007;3:100-8.
18. Hadjerrouit S. Developing wep-based lerning resources in school education: A user-centered approach. Interdiscip J E Learn 2010;5:65-53.
19. Bahreininejad A. E-learning and associated issues in iran. Int J Distance Educ Technol 2006;1:4-1.
20. Amal Nok MS. Global experience, knowledge and technological development in the field of information technology. Proc Dev Scie Technol Iran (Inst Humanit Cult Stud) 2007;5:467-98.
21. Brower M, Dojonj O, Stont N. Toward Online Learningtranslated by Farideh Mashayekh and Abbas Bazargan. 1st ed. Tehran: Agah Publication; 2003.
22. Efat Nejad A. Evaluation of the Use of Information Technology of Graduate Students of Shiraz University. MA Thesis, Graduate School, Shiraz University; 2005.
23. Giavrimis P. Teachers attitudes towards training in ict: A critical approach. Qual Assur Educ 2011;19:296-83.
24. Mousavipour A. Examine the Role of Communication Technology in the Educational Environment at Tabriz University. MA Thesis in Social Sciences, University of Tabriz: College of Humanities and Social; 2005.

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