

Educational strategies Based on Informantion and Communication Technology (ICT)

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Abstract

Purpose: Educational strategies are methods which influence on learning quality and students can make use of them in their studying and learning in order to obtain their education and learning objectives. **Methodology:** The statistical population of the research was all teachers of primary schools in Iran who 330 ones were randomly selected as the samples by Cochran formula. The current research was investigating the educational strategies based on information and communication technology (ICT). **Finding:** Then, having reviewed the theoretical bases and history of the research, two factors (educational strategies based on information and communication technology between teachers and students) and 33 parameters have been extracted. and also makes teachers get prepared for providing educational and training programs, use facilities and various methods for presenting educational services, increasing scientific and professional level, increasing job-motivation, developing occupational skills, improving institutional management by school-centering approaches, improving informing system at schools, settling system of teachers' informing at schools.

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1. Introduction

The new economic and social manner of dealing with the rapid development of information and communication technologies (ICT) and their wide usage in all areas of life provoke new requirements and changes in education. For several decades computers were transformed from exotic tools into the symbol of the society and its progress. The most important component of contemporary education is the initial forming and development of competences that provide a high level of realization of personality in a competitive environment with respect to solid knowledge, intelligence, mobility, adaptability, entrepreneurship, and confidence in one's own abilities. "A competent individual is able to combine knowledge, skills and attitudes, and to apply and make use of prior learning (whether acquired formally, non-formally or informally) in new situations" (Council conclusions, 2010).

In (Key competences, 2007) key competences are defined as a "combination of knowledge, skills and attitudes appropriate to the context. Key competences are those which all individuals need for personal fulfillment and development, active citizenship, social inclusion and employment." The Reference Framework (Key competences, 2007) sets out eight key competences: 1) Communication in the mother tongue; 2) Communication in foreign languages; 3) Mathematical competence and basic competences in science and technology; 4) Digital competence; 5) Learning to learn; 6) Social and civic competences; 7) Sense of initiative and entrepreneurship; 8) Cultural awareness and expression. Due to the widespread applications of ICT in all human activities, the ICT education and education through ICT allows all key competences to be involved and developed (Tuparova et al, 2014).

Therefore, at the present era, there are convincing reasons for making more use of digital sources and communication systems in education systems. By means of digital devices and equipments the process of learning will be easier and students with deferent personality and morale will more be attracted to learn things and also teaching will become more efficient than ever and new horizon will be appearing before their eyes and work-load of teachers will decrease and if it spreads through schools all over IRAN, efficiency of national economy in associated with education and level of knowledge will be increased. Therefore, it could be claimed that ICT in education system has penetrate greatly and has undoubtedly influenced on teaching-learning quality and quantity in educational environment. As matter of fact, ICT is able to develop learning-teaching level by making use of illustrative and communicative contents and to create true opportunities for learning. ICT has got capabilities for accelerating, enriching and deepening skills (Davis and Tearle 1999).

On the other side, one of the advantages of ICT is to make schools more efficient and fruitful by various ways to develop teachers' occupational and make them easier (Krischner and Woperies, 2003). Berker and et al (2007) belived that one of the advantages of making use of ICT is to increase the education motive, self-confidence and development in independent learning. Abernathy's study on ICT in education system revealed that educational strategies of ICT have significant relationship with a part of growth which emphasizes on ICT mudolation in curriculum of class activities (Haghshenas, 2009).

Various studies showed that making use of today' technologies like computers and worldwide-web in the class can give such opportunities for students to learn faster and experience more satisfaction in the class. Also, using the internet in education can reduce the fee and tuition of education, update data and develop the teaching techniques (Abernathy, 2005 ICT has made education system to switch over new effective and efficient models in order to deal with ever increasing complexities and requirements of today's world (Chang and Palmer, 2003). Those who

are using ICT in their education and other scientific purposes have possibly got more effective teaching-learning than those who still rely on traditional methods. ICT makes teaching-learning process easier (Wang, 2008 – Kirkwood & Price, 2005 – Passey, 2006 – Clegg, Trayhurn & Johnson 2000). Therefore, the advantages of making use of ICT in world's education systems can be mentioned as following: increasing communicative networks by means such as e-mails, chat-group, chat-rooms, more flexible manual access to studies, reducing the place and time obstacles increasing quality of academic education, economical use of sources by changing the place, increasing the number of books and as result, moving toward e-publication and accelerating learning (Rawat & Rawat, 2006).

Research result of conducted studies on ICT influence on education system of IRAN indicated an increase in quality of students' learning (Najafi, 2006 – Hajfroosh and Orangi 2004). Therefore, as Zarei, Zavaraki and Dehghani (2015) mentioned ICT influence on teaching-learning process when it is used in a very purposeful, planned and controlled way under teachers' supervision, conducting, support and design. ICT can create possibility of individual learning, group-learning and participating learning in national and international level. Such technologies can help teachers and students use capabilities and network data-bases as well as existing facilities and sources and those which are at reach of teachers, and enrich their teaching and learning activities (Richard, 2007). Learners generally learn in two ways: deep learning (searching meanings, linking ideas and concepts with each other, using documents and observations, getting interested in subjects) and surface learning (memorizing irrelevant items, aimless study, limiting studies to titles and fear of failure).

Learners at surface learning make use of a method which is based on re-production and saving and memorizing facts but learners at deep learning are looking for fundamental purpose, understanding subjects which must be learnt (Kajbafi, Ashoori and Ashoori, 2013). Researchers have introduced another leading approach which its specification is to make the most use of their efforts in an organized way for gaining maximum mark and include organized study, time management, expected homework awareness and maximum progress and success of learners (Entwistle & Tait 2000). Successful Students are those who make use of various learning approaches and are stimulus and control their progress. In brief, they are self-organizing learners. Unfortunately, most of students are not like that, because they do not use other approaches effectively or are not stimulus. They are going to be in danger of education failure (Kafman 2001).

In general, learning approaches influence on learning quality. Such approaches are of those methods that students learn them during their education in order to gain their education objectives. For instance, learning source management approaches are facilitating approaches which lead and conduct the learners in controlling learning sources in order to make them compatible with their homework in the way that learners are able to do the homework. On the other word, source management approaches indicate the quality and quantity of involvement in doing homework and includes planning process along the identified objectives for gaining better results (Farajollahi, 2015). Most of researches' results show that the learners' education performance depends on effective learning approaches while learners' lack of proficiency on learning approaches may cause a lot of problems and finally they will fail.

Learning approaches include time management, study environment, balancing the effort, learning from others at their age and asking for assist (Pitchner, 2004 and Campbell 2001). In another study, progress objectives, self-efficiency and learning approaches were investigated and the findings indicated that most of students prefer traditional learning environment which such preference is based on the more environment adaptation with students' personal learning style. The

analysis has shown that those who preferred traditional learning environment were objective-oriented and made more efforts at their learning while those who preferred non-traditional classes were sure that they could manage the class and would have better performance (Karen, Fran & Daniel, 2010).

As mentioned, the researches indicate the relationship between learning environment and education performance. In student-centered learning environment based on ICT, learning techniques are considered as a powerful instrument. The instruments and tools for traditional classes like pens, pencils, notebooks and text-books are still very important but for modifying and adjusting the ideas and students-accessibility to the data and sources they seem unadequate, specially computers and audio-video devices can make the student get involve with their daily life problems and as a result, their learning motivation will be increased. Therefore, this current research is looking to investigate the educational strategies based on ICT at teachinh mathematics, and science at primary school form teachers' point of view.

2. Methodology:

The population is all teachers in education organization at primary schools. By means of Cochran formula the number of them became 320 people. This current research a questionnaire was designed after laibrary studying and reviewing the previous researches in this field.

In order to investigate content reliability of the questionnaire, ten specialist and expert in the field of ICT applicable in curriculum and education reviewed and checked it. In order to investigate structure reliability of the quaeestionnaire, exploratory factor analysis was used by means of SPSS software, in the way that after invstigating missing data in the questions and tests, factor analysis was investigated and findings indicated that KMO was 0.915 and due to the fact that it was more that 0.8, it could be said that it was the highest assumed item. Afterward, the sphericity of the variables was investigated and it was found that the mentioned variable is significant at $\alpha=0.01$ and had sphericity. Also, by investigating the variance which is more that 0.60 it can be mentioned that all assumed items in connection with analysis factor of educational strategies have been observed by teachers and finally two factors – educational strategies based on ICT from teachers' point of view and educational strategies based on ICT from students' point of view – were onbtained. Finally, in order to invstigate the valididty coefficient, Cronbach Alpha Coefficient was used and following results were obtained.

Table 1. results of structure factor analysis of educational strategies based on the ICT

Factors	Indexes	Questions
First factor	Educational strategies based on ICT from teachers' point of view	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 & 19
Second factor	Educational strategies based on ICT from students' point of view	20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32 & 33

3. Findings:

Among the research samples, there were 209 male teachers and 111 female teachers who 121 of them were married and the rest (199 of them) were single. Thirty-nine of them had associates' degree and 157 of them had Bachelor graduates, 117 of them had Master graduates and 7 of them had PhD. Thirt-five of them had 5 to 10 years' experience, 123 of them had 10 to 15 years' experience, 140 of them had 15 to 20 years' experience. 10 of them had 20 to 25 years' experience and 12 of them had 25 to 30

Years' experience at teaching. Form viewpoint of accessing to the internet, 149 of them were using ADSL. 162 of them were using wifi and 9 of them was not using internet. And fron viewpoint of acquaintance with ICT, 210 of them were acquainted with Microft-Office Word, 51 of the were acquainted with Windows, 23 of them were acquainted with Powerpoint, 15 of them were acquainted with Microsoft-Office Excel and 21 of them were acquainted the internet. From viewpoint of owning PC, 300 of them had a PC and 20 of them did not have a PC.

In this current research after determining the factors in connection with that educational strategies based on the ICT by making use of exploratory factor analysis, educational strategies based on ICT from teachers and students' points of view were investigated by means of single group "t" test and the following results were obtained:

Table 2. statistics indexes in connection with educational strategies based on ICT

Parameters	Centet-Orienting Indexes			Dispersion Indexes			Distribution Indexes		
	View	Average	Mean Value	Variation Domaine	Variance	Standard Deviation	Standard Error	Skew Coefficient	Elongation Coefficient
Educational Strategies Based on ICT from Seachers' Point of view	76	59	64.17	44	168.83	12.99	0.72	0.16	-0.28
Educational Strategies Based on ICT from Teachers' Point of view	52	43	45.05	55	70.98	8.42	0.47	0.27	-0.01
Educational Strategies	131	100	109.01	67	440.37	20.98	1.17	0.16	-0.52

Table 3. single group "t" test result for educational strategies based on ICT for students

Question	Test	Theoretical Average	Imperial Average	"t" Value	Degree of Freedom	Level of Significance
1	Developing innovation and creation in students	3	3.72	17.66	319	0.001
2	Developing job-creation culture in students	3	3.84	22.13	319	0.001
3	Developing education methods for students	3	3.20	4.86	319	0.001
4	Teaching thinking and research methods to the students	3	3.33	9.54	319	0.001
5	Teaching how to search in safe data bases to the students	3	2.55	-7.94	319	0.001
6	Use of ICT as a modulated program	3	4.22	29.51	319	0.001
7	Using ICT in curriculum activities	3	3.97	28.73	319	0.001
8	Using ICT in learning method by students	3	3.88	7.08	319	0.001
9	Developing students partnership	3	3.45	8.91	319	0.001
10	Supporting students' cultural and scientific associations	3	2.67	-3.90	319	0.001
11	Providing communication facilities for learnin-teaching process	3	3.30	10.34	319	0.001
12	Conducting research in group	3	3.39	10.69	319	0.001
13	Electro-learning facilities for students	3	3.71	24.90	319	0.001
14	Accelerating learning process by using ICT	3	3.82	17.84	319	0.001
15	Attention to students needs	3	3.46	8.77	319	0.001
16	Describing students' behavior	3	3.69	11.69	319	0.001
17	Formulating students' behavioral observation list	3	2.78	-2.07	319	0.0039
18	List of students interests	3	3.13	2.69	319	0.007
19	Identifying students background and experience	3	2.39	-9.75	319	0.001
Total	Educational strategies based on ICT for students	3	3.37	9.87	319	0.001

Considering the Table above and emphasizing on "t" values, it could be said that there is a significance difference at $\alpha=0.01$ between theoretical average and imperial in all parameters of education approchers based on ICT. Therefore, in parameters 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16 and 18 and all of imperial average values are higher that theoretical average. From teachers' points of view, it is said that they are higher than what it had been expected and or higher than

average value while imparical average of parameters 5, 10, 17 and 19 are less than theoretical average. It indicates that teachers' viewpoints are less than what it had been expected and or less than average value.

Table 4. results of single group "t" test for investigating educational strategies beased on ICT

Ques tion	Test	Theoret ical Avrage	Imper ical Average	"t" Value	Degre e of Freedom	Level of Significan ce
20	making teachers get prepared for providing curriculum and exercise	3	4.01	26.94	319	0.001
21	Using various methods or facilities for presenting education services	3	3.39	19.28	319	0.001
22	Developing scientific and specialized level of teachers	3	3.10	1.57	319	0.116
23	Increasing occupational motivation of teachers	3	3.23	5.34	319	0.001
24	Developing occupational skill of teachers	3	2.18	-15.73	319	0.001
25	Improving institutional management by school-centering approach	3	3.45	16.25	319	0.001
26	Improving informing system at schools	3	2.78	-3.75	319	0.001
27	Settling teachers' informing system at schools	3	2.75	-4.15	319	0.001
28	Using educational automation in defferent schools functions	3	2.35	-11.22	319	0.001
29	Selecting proper educational contents by teachers	3	3.44	13.25	319	0.001
30	Planning contents by teachers	3	3.50	8.84	319	0.001
31	Formulating education objectives	3	3.25	4.97	319	0.001
32	Prepatring behavior objectives	3	3.38	2.26	319	0.024
33	Using proper teaching methods	3	3.4	9.67	319	0.001
Total	Educational strategies based on ICT for teachers	3	3.21	6.48	319	0.001

Considering the table above and emphasizing on "t" values, it can be mentioned that there is a significant difference at $\alpha=0.01$ between theoretical average and imparical average in all parameters of educational strategies based on ICT for teachers, but "developing specialized and scientific level of teachers. Therefore, considering the fact the parameters 20, 21, 23, 25, 29, 30, 31, 32 and 33 and all imparical average values are higher than theoretical average. It is said that they are higher than what it had been expected and or higher than average value while imparical average of parameters 24, 26, 27 and 28 are less than theoretical average. It indicates that teachers' viewpoints are less than what it had been expected and or less than average value.

Table 5. results of single group "t" test for investigating educational strategies based on ICT from teachers' points of view

Theoretical average	Imperial average	"t" value	Degree of freedom	Level of significance
3	3.30	8.52	319	0.001

Considering the table above and emphasizing on "t" values, it can be mentioned that there is a significant difference at $\alpha=0.01$ between theoretical average and imperial average in educational strategies based on ICT. It is said that from teachers' points of view, educational strategies based on ICT is higher than average level or expected level.

4. Discussion:

The research results with the purpose of determining educational strategies based on ICT for students and teachers showed that ICT in education can develop innovation and creativity, job creation, student-centered teaching-learning methods, use of ICT as a modulation program, teaching how to research in safe data-bases, teaching research and thinking methods, use of ICT in curriculum, use of ICT in students' learning, students' partnership, supporting students' scientific and cultural associations, providing communication facilities for teaching and learning, conducting research in group, existence of electro-education facilities for students, accelerating learning process by using ICT, attention to student's needs, describing students' behavior, formulating list of students' behavioral observation, list of student's interest, identifying students background and experience. Also, from teachers' points of view, "teaching how to research in safe data-bases", "supporting students' scientific and cultural associations", and "formulating list of students' observation" and "identifying students background and experience" are less than the average level which indicate the weakness of educational strategies based on ICT in Iranian education system.

Also, the results showed that educational strategies for teachers include "making teachers get prepared for providing curriculum and exercise, making using various methods or facilities for presenting educational services, developing scientific and specialized level of teachers, increasing teachers' occupational motivation, improving teachers' occupational skill, improving institutional management with school-centering approaches, improving informing system at schools, settling teachers informing system, using educational automation in different functions of schools, selecting proper education contents with teachers, content planning with teachers, formulating education objectives, using proper teaching methods. And from teachers' points of view, improving informing system at schools, settling teachers informing system, using educational automation in different functions of schools are less than average level which indicates that there is weakness in teachers' development program and training man-power. Also, settling informing system at schools is one of the necessary items in education system. There is conformity in this current research results and those carried out by: Hajfroosh (2004), Daie Zade et al (2014), Bigdelli (2016), Ezati (2016), Feghi Najm Abadi (2016), Niazi (2016), Mousavi (2017) Gramin (2009) and Chin et al (2011).

In describing and defining the research results, it is possible to emphasize on its effectiveness on new teaching-learning techniques at schools. These techniques increase not only students' learning motivation but also education quality and make learning easier. The level of attractiveness of education will be increased and teaching-learning will take place where the students can do their homeworks without stress, with happiness and joy mixed with interacted-learning. On the

other hand, there are various factors which effect on better performance of students such as progress in teaching-learning methods, student confronting with various educational media and auxiliary educational media, availability of all kinds of over-time classes and side-study learning.

Therefore, it can be concluded that new media and new techniques used in education are able to makew an evolution in learning-teaching environment and be appealing in order to attract students in learning process and present a stimulus motivation for improving quality of education. Solid and boring traditional environments turn into very attractive and joyful places. Education motivation, self-efficiency, creativity, critical thinking, time management and place of study, inside orientation to the onbjectives in learners, and environments based on ICT will be increased and under such circumstance cooperation with those who are at their age will be developed and increased, too and there will nothing else but just progress in their social and educational performance.

Therefore, it is possible to make a conclusion that beside other factors such as teachers, students and contents technology factors should be taken into consideration as effective factors. Because teaching and learning processes without intelligent technology will not be useful. In such regards, it can be said that in order to make premium and effective use of technology, teachers have leading and unique roles, because no one else can make use of technology at teaching in its most effective way but just teachers. Therefore, teachers' art is to identify capabilities, opportunities, and challenges with threatens ruling every single technology as well as to make use of them in order to realize education objectives (Zavaraki 2016). As Brower (2003) defined: in ICT era, from one side the education system is required to review and reform the curriculum for computer-literacy and from other side it is required to make a interaction between learners and learning sources. Therefore, reviewing traditional teaching methods and substituting new methods with today's facilities and up-to-date equipments increase the cognitive skills. Moreover, making use of ICT for obtaining high-quality learning objectives is unavoidable (Brower, 2003).

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