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The Role of Skill and Knowledge in Using Educational Technology from the Professors' Points of View in Isfahan FARHANGIAN University

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Abstract

This paper aimed at studying the influential factors on enhancing the efficiency of educational technology from The Isfahan University of Teachers' professors' points of view. The methodology used in this paper is descriptive and based on a survey. The professors in different colleges and higher education centers of The Isfahan University of Teachers constitute the population of this paper, who are 85 people. The sampling was done randomly and based on the size of population and the variable of workplace. The data were collected via a questionnaire made by the researcher. Made by the researcher, the formal and content reliability of the questionnaire was confirmed by the specialized and experienced professors. The factor analysis was used to check the structure reliability. The validity of the questionnaire was measured by the Cronbach's Alpha as 0.91. The results show that the professors' skill ($t=11.482$, $p<0.01$) and knowledge ($t=10.057$, $p<0.01$) have significant roles, higher than average, in using the educational technology.

Key words: Educational Technology, The University of Teachers, Skill, Knowledge

Introduction

The main apostolate of The University of Teachers is educating humans who are teachers in future and responsible for educating the new generation. Realization of development and having a knowledge-based society depends more on the efficient education. The documents show that one of effective and efficient factors is educational technology. The importance of knowing about and using educational technology is due to this fact that simplifying the education process and making educating-learning process efficient and effective result in improving the quality of learning process (Rastgarpour& Abdollahi, 2005). Using educational technology as a supplemental and supportive element in traditional ways of education is rapidly developing to solve educational problems including designing, administering, evaluating and finally achieving

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the effective education purposes. The studies show that teachers not only use educational technology as teaching methods complement in classes, but also as a way to develop knowledge, personal skills and conveying their meaning. In this context, teachers are the main agents of entering and successful communication of technology in education system. Teacher is the most important agent in any education system, who plays the roles of sample, instructor, and advisor for students, and one who guides the education process. His competency, efficiency, interest and professional abilities determine efficiency and output of the educating-learning process; hence, in any education system, considering the teachers and other players in educational programs is the most important factor of success or failure in educational innovations. Teacher has a specialized and critical task, so there should be much consideration to select a teacher as well as much investment in employing and keeping him/her. (Salsabili, 2011).

Zirkle (2002) believes that comprehensive knowledge of professors' knowledge is one the most important factors in creating motivation and increasing professors' scientific and technical creativity. In other words, understanding the professors' skills and knowledge of using and enjoying educational technologies may result in enriching the learning place. Also, there should be an opportunity for students to learn quickly, perform better, and have satisfaction of attending in classes.

Kelly (2002) concluded, according to a research titled "preparation for using technology and knowing how technology supports students learning", that preparation for using technology and knowing how to supports learning should be included in fundamental professors' skills.

According to Mitchem and Wells (2003), belief and opinions of faculty members and their understanding of teaching is influential on enjoying educational technology. The professors who don't believe in efficiency of modern technologies and new teaching methods resist against them. Not only some professors, but also some managers avoid using technological methods.

Godfery (2004) did a survey in England. In this survey, the professors asserted that educational courses in teaching increased their ability in teaching skills.

Selvedood and Pinkingtone (2005) say that teachers believe that technology decreased their work hours, made them more creative, and increased their skills.

Luise and Godisen in a research done in 2004, Wolverhamton University, provided a report titled as "improving education by using technology in higher education". The universities included in this research had valuable experiences in developing and using technology in teaching throughout 1998-2001. The report provided good mechanisms for using technology in higher education successfully.

Villegas-Reimers (2007) know the professors' professional skills necessary and essential to change education system. In this context, they considered some factors (modern teaching methods, educational technology, and evaluation).

The results gained by Farhadian et al. (2007) on faculty members' skills and their need to learn teaching methods show that the professors knew their skill levels equal to, at least, mastery over administering, but they needed to be educated more.

Maqami (2007) in a research on influential factors on level of using educational technology in teaching in university from the faculty members' points of view, Ahvaz universities, showed that the faculty members believe that such factors as tiredness, lack of enough time, having no knowledge how to use educational tools, lack of good skills in using such technologies, having no knowledge of different educational materials, having insufficient skill in making educational materials, heavy tools and difficulties in carrying them, the high number of students in classrooms, and being afraid of using the tools incorrectly affect insufficient application of educational technologies in teaching in universities.

Farhadian et al. (2007) in a research on faculty members' skills and their need to be educated about teaching methods concluded that the professors knew their skill levels equal to mastery over administering but they needed to be educated more.

A research done by Naderi et al. (2011) on studying and comparing professional skills of teachers in sciences and those in humanities showed that the level of teachers' knowledge on using educational technologies is on low or very low level, and this fact that this problem is more related to lack of facilities and teaching aid tools. The teachers, especially those who teach the sciences, should get knowledge of how to use modern technology in order to avoid traditional ways of teaching as well as cause equal conditions of education in different areas.

Nagol (2013) in a research titled as "6 challenges facing technology in education" showed that unlike agreements with developments in educational technology, there are some other challenges in effective using of technology, which make these technologies impossible to use. According to him, although some of these challenges are caused by the system, the teachers and instructors are guilty as well. Having no preparation and no budget were among such challenges in the past, but now, as well as these, there are some other challenges such as professional progress, knowledge of technology, resistance against changes, modern teaching methods in schools, informal teaching, failure in using technology for effective education.

The literature shows that technology is very important in modern society; everyone needs to be technologically literate (Camp, Translated by Yaqma, 2010). Educational technology consists of principles and procedures that are used to solve educational problems practically. In any field of study, technology is hand in hand by progress in that science. The man's need to solve his social problems always forces him to make other fields closer to using educational technologies (Fardanesh, 2011); however, technological skills cannot increase students' abilities to learn by themselves, but there are some other conditions to create a better environment for learning. These conditions are attitude, skill, knowledge, instructors' skill in using educational technology, content standards, educational planning sources, assessment, efficiency of technology in learning, and stressing on students to make them active and productive. The effective instructors promote their technological skills and use technology in the classes effectively. This usage should be in accordance with the students' need to learn (Chin, translated by Zandi& Jarihi, 2006).

Though the necessity of using educational technology in different higher education systems is apparent, the reality shows no attention to this scientific field. Education and learning follows the same old traditional ways of teaching, and there are few solutions to the new problems. Therefore, what made me to do a research is that unlike some available documents that show the efficiency of technology in improving the quality of education in education and learning, why don't the university professors use educational technology in their teaching methods? In other words, what are some influential factors on improving the efficiency of using educational technology in The University of Teachers? Why are not educational technologies, including

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teaching aid tools and modern methods and techniques used in universities? What are the solutions? Answering to these questions requires researches in order to help academic members progress, and develop sciences. It is worth-noting that educational technology is so vast, hence, in this paper, the professors' skill and knowledge of educational technology is going to be considered.

Questions of the Paper

1. To what level is the role of the professors' skill in using educational technology?

2. To what level is the role of the professors' knowledge in using educational technology?

Methodology

The methodology used in this paper is descriptive and based on a survey. The population was all professors, full-time or part-time, in Fatema Zahra College, Shahid Bahonar, Shahid Rajaei higher educational center, Isfahan. The statistical population are 115 people among whom 85 people constitute the sample size. 50.6% were female and 48.2 were male. 7.1 of the population were associate professors, 63.5 lecturer, and 22.4 were secretaries. The measurement tool was a questionnaire made by the researcher, including 2 factors and 16 items in a 5-scale Likert's scale (very high, high, average, low, very low), which was studies by the experts, and was edited before taking the statistical population. They answered carefully and handed in to the researcher.

The factor analysis was used to determine the validity of the questionnaire. The validity of the questionnaire was determined by the Cronbach's Alpha coefficient that is one of internal parallelism. The Cronbach's Alpha coefficient shows the internal correlation among the questions, and its value is ranged between 0 and 1. Closer to 1, more correlated the questions are. The Cronbach's Alpha coefficient for the questionnaire in this paper is 0.91, showing its high validity. Data analysis was done in two descriptive and deductive levels. In descriptive statistics level, data analysis was done by using frequency distribution tables, average percentage and standard deviation. In deductive statistics level, Kolmogorov's test was used to check the data normality, and t-test was used to analyze two independent groups and anova.

ISSN: 2278-4012, Volume:4, Issue:4, October 2015

The results of factor analysis

Revising the questionnaire and studying its structural reliability, the researcher first studied the literature and then suggested a framework based on the different procedures. The framework includes two items, the professors' skill and knowledge.

Table 1. Factor analysis of the professors' skill

The professors' skill	Size (KMO)	Factor load
The ability in managing time to use educational tools		0.563
The skill for communicating effectively with students by using educational tools		0.842
The professors' experience in using educational tools		0.845
Sufficient skill in creating educational materials		0.594
The professors' skill in doing educational and research activities by using educational tools	0.870	0.854
The professors' seriousness in teaching and learning processes by using educational tools		0.856
Creating capability in assessing the students' assignments		0.788

Increasing the professors' professional abilities by administering short- term courses while working		0.687

As Table 1 shows, the highest factor analysis in the factor of the professors' skill is related to the professors' seriousness in teaching and learning processes by using educational tools with a factor load of 0.856 and the lowest factor analysis in the factor of the professors' knowledge is for the item sufficient skill in creating educational materials with a factor load of 0.594. KMO, about the enough amount of sampling, was 0.870, that is high enough acceptable. Also, the factor loads of any sub-factors on the professors' skill were all higher than 0.5.

Table 2. Factor analysis of the professors' knowledge

The professors' knowledge	Size (KMO)	Factor load
The technology experts' knowledge in universities to use educational technology effectively	0.820	0.554
The principals' knowledge of educating good human force able to use educational technology		0.746
Confirming on appropriate use of technology experts' abilities and experience in managing educational media		0.654
Knowledge of using technology in planning the		0.698

educational programs in universities		
Executives' knowledge of the ways of promoting the professors in using educational technology		0.802
Educational workshops' knowledge for increasing knowledge of educational technology		0.865
Knowledge of latest technological websites and journals on educational technology		0.817
The professors' knowledge of using educational technology to planning a good lesson plan		0.804

As Table 2 shows, the highest factor coefficient in the factor of the professors' knowledge is related to the item establishing educational workshops to increase knowledge of educational technology with a factor load of 0.865, and the lowest factor coefficient is related to the item technology experts' knowledge in universities to use educational technology effectively with a factor load of 0.554. KMO, about adequacy of sampling, was 0.802, which is high enough and acceptable. Also, the factor loads of any sub-factors of the professors' knowledge were all higher than 0.5.

The results of the descriptive part

Table 3. The frequency distribution and the percentage of answering to the questions related to the professors' skill

ISSN: 2278-4012, Volume:4, Issue:4, October 2015

No.	To what level, the following items cause application of educational technology in the university of teachers?	Statistical index	Very low	Low	Average	High	Very high	Mean
1	Ability in managing time to use educational tools	Frequency	0	2	21	41	21	3.95
		percentage	0	2.4	24.7	48.2	24.7	
2	The skill of effective communication with students by using educational technology	Frequency	0	3	25	36	21	3.88
		percentage	0	3.5	29.4	42.4	24.7	
3	Having experience in using educational technology	Frequency	0	2	26.6	31.5	25	3.94
		percentage	0	2.4	30.6	36.5	29.4	
4	Sufficient skill in creating educational materials	Frequency	0	10	33	27	12	3.50
		percentage	0	11.8	38.8	31.8	14.1	
5	The professors' skill in doing educational and research activities by using educational media	Frequency	0	2	26	30	25	3.93
		percentage	0	2.4	30.6	35.3	29.4	
6	The professors' level of seriousness in learning-teaching process by using educational equipment	Frequency	0	3	32	26	21	3.79
		percentage	0	3.5	37.6	30.6	24.7	
7	Creating abilities in assessing the	Frequ	0	2	29	35	18	3.82

ISSN: 2278-4012, Volume:4, Issue:4, October 2015

	students' assignments	ncy						
		percentage	0	2.4	34.1	41.2	21.2	
8	Increasing the professors' professional abilities by administering short-term courses while working	Frequency	2	9	25	24	23	3.68
		percentage	2.4	10.6	29.4	28.2	27.1	

The results in Table 3 show that the highest average score in answering the questions related to the factor of the professors' skill is 3.95 for the item 1, i.e. ability in managing time to use educational tools, and the lowest is 3.50 for the item 4, sufficient skill in creating educational materials.

Table 4. The frequency distribution and the percentage of answering the questions related to the factor of the professors' knowledge

No.	To what level, the following items cause application of educational technology in the university of teachers?	Statistics index	Very low	Low	Average	High	Very high	Mean
9	Technology experts' knowledge in universities in using educational technology more effectively	Frequency	1	1	17	41	24	4.02
		percentage	1.2	1.2	20	48.2	28.2	
10	The officials' knowledge in educating human force in using educational technology	Frequency	0	4	26	31	23	3.86
		percentage	0	4.7	30.6	36.5	27.1	
11	Stressing on desirable use of technology experts' abilities and	Frequency	0	4	21	40	20	3.89

	experience in managing educational media	percentage	0	4.7	24.7	47.1	23.5	
12	Knowledge of using technology in planning educational programs in universities	Frequency	0	3	26	35	20	3.85
		percentage	0	3.5	30.6	41.2	23.5	
13	The executives' knowledge in the professors' motivation in using educational technology	Frequency	0	10	26	31	17	3.65
		percentage	0	11.8	30.6	36.5	20	
14	Establishing educational workshops to increase the knowledge of educational technology	Frequency	3	12	23	22	24	3.61
		percentage	3.5	14.1	27.1	25.9	28.2	
15	The knowledge of the latest information websites and journals in educational technology	Frequency	2	13	26	20	22	3.56
		percentage	2.4	15.3	30.6	23.5	25.9	
16	The professors' knowledge of using educational technology in planning the lesson plans	Frequency	1	5	34	19	26	3.75
		percentage	1.2	5.9	40	22.4	30.6	

As the Table 4 shows, the highest average score in the factor of the professors' knowledge is 4.02 for the item 9, i.e. technology experts' knowledge in universities in using educational technology more effectively, and the lowest average score is 3.56 for the item 15, the knowledge of the latest information websites and journals in educational technology.

The results of the deductive part

ISSN: 2278-4012, Volume:4, Issue:4, October 2015

Table 5. The Kolmogorov-Smirnov influential on developing the application of educational technology

Factors	Statistic	Freedom degree	Significance level
The professors' skill	0.112	64	0.080
The professors' knowledge	0.078	64	0.200

The results in this Table show the influential factors on developing the application of educational technology. The results show that the Kolmogorov-Smirnov scores are normal for both factors of the professors' skill and knowledge.

Question 1: To what level is the role of the professors' skill in using educational technology?

Table 6. The comparison of the average score of the role of the professors' skill in using educational technology

Factor	Average	Standard deviation	Deviation from average	T	Freedom degree	Significance level	Trust distance lower than 95%	Trust distance higher than 95%
The professors' skill	3.85	0.65	0.074	11.482	76	0.001	0.70	1

According to the Table 6, the average score of the role of the professors' skill in using educational technology is 3.85. Measured t is higher than the t in the table; therefore, the score for the role of the professors' skill in using educational technology is higher than average. The results, also, show that 95% of the scores range from 3.15 to 4.85.

ISSN: 2278-4012, Volume:4, Issue:4, October 2015

Question 2: To what level is the role of the professors' knowledge in educational technology?

Factor	Average	Standard deviation	Deviation from average	T	Freedom degree	Significance level	Trust distance lower than 95%	Trust distance higher than 95%
The professors' knowledge	3.79	0.70	0.079	10.057	77	0.001	0.64	0.95

As this table shows, the average score of the role of the professors' knowledge in using educational technology is 3.79. The calculated t is larger than the t in the table; therefore, the score obtained for the role of the professors' knowledge in using educational technology is higher than the average. Also, the results show that 95% of the scores range from 3.15 to 4.74.

Discussion and Conclusion

Universities are the most valuable resources any society owns for development and progress since the graduated students guide the government and society, promote culture, innovate, create modern technological, industrial, commercial and security devices in the country (Araste, 2003). The striking feature of the University of Teachers is training teachers and making changes in change, development agents and education founders in the country, and the productivity role of teacher is emphasized on people, societies' productivity and effective communication (Shim, 2008). The results show that success of any education system is mostly dependent on the professors' professional skill and knowledge. According to Japanese, the competence of any education system can be realized by measuring the competence of its instructors. Therefore, the

ISSN: 2278-4012, Volume:4, Issue:4, October 2015

question 1 can be concluded that teacher is the most important member in any learning-teaching process, and is the main architect of any education system. Hence, the world is changing so fast and the teachers, like the other professional groups, should accept that their primary education is not so helpful, and they should update their knowledge. They should gain the skill of deep learning which could be used out of the institution. The increasing progress of technology and science has resulted in creating different specialties in all fields. These findings conform to those found by Farhadian et al. (2007), Sell wood and Pingington (2005), Villegas-reimers (2007). The results of the answers to the second question show that the role of the professors' knowledge in using educational technology is higher than average. On the other hand, as the professors' knowledge level is low, this note is of great importance that developing technology in education needs teachers to be trained; therefore, teachers should get informed of their new roles and tasks, gain necessary professional skills, apply technology in education, and be supported and guided constantly. In this context, providing educational films in applying the instructors' professional skills in some classes for teachers while working (personal or distance) by education system is necessary. Nowadays, making a good learning environment is a challenging and hard task to do. Therefore, using a creative and appropriate teaching methods and motivating to learn is very vital. Hence, the instructors should think of the ways and the content of teaching, and motivate creative learning workshops. Moreover, they should develop some other skills such as communication skills, effective group work, critical argument, and self-assessment by administering learning-teaching workshops to promote the process of teaching and learning. These findings are in the line with the general results (2002), and those found by Farhadian et al. (2007). Given the importance of educational technology, it is suggested, based on the paper's results, that there should sufficient budget for buying educational technological tools so that the instructors can use the best and modern teaching methods. Furthermore, the new teachers can be informed of the modern educational innovations in their own specialized major. In this context, they will be able to optimize teaching and make interest in students to learn deeply by using various teaching methods, cognitive techniques and instrumental techniques, as well as using different tools and equipments in teaching and learning processes, and by applying modern techniques such as information technology, communication technology, and educational

technology to teaching. Also, increasing the professors' professional abilities by administering short term courses while serving should be considered.

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