

The Impacts of Information and Communication Technology on Teachers' Educational Performance

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Abstract

The present study aimed to determine the impacts of Information and Communication Technology (ICT) on high school teachers' educational performance. This was a descriptive-correlational study. Statistical population included all second period male and female high school teachers in Chabahar (N=198). Sample population, applying a stratified random sampling method, was 131 individuals. Using researcher-made questionnaires on information and communication technology and educational performance, the extent of teachers' use of ICT and their educational performance were examined. To determine the reliability of these questionnaires, Cronbach's alpha coefficient was used. In this regard, Cronbach's alpha coefficients of questionnaires on information and communication technology and educational performance were 0.83 and 0.87, respectively. Obtained data was analyzed using statistical indicators including mean, one sample t-test, Pearson correlation coefficient, independent t-test, and analysis of covariance. The results indicated that the extent of teachers' use of ICT was moderate. ICT had great impacts on teachers' educational performance. Moreover, it had positive effects on involving students in the learning process, establishing relations between teachers and students, identifying appropriate educational methods, recognizing issues disrupting the educational process and solving them and establishing relationships between teachers and parents.

Keywords: Information Technology, Communication Technology, Educational Performance

Introduction

The educational system of the country must be dynamic consistent with social and cultural developments. Information technology is one of the factors affecting changes which impress a major part of the society. The use of new information technologies, like World Wide Web, in education has long been taken into consideration by researchers, such that some asserted that computer-related skills are creative tools that can be used in students' learning activities (Murphy, 1995; Layfield, 1997; Talker, 1998, as cited in Pourafshari, 2006), stated

that the Internet is a powerful and effective tool for learning in the information age and mentioned that it is a key to teaching in the third millennium. Kinyansen (1995) believed that applying information superhighways develops students' problem solving and critical thinking skills.

Nowadays, practical skills of ICT and the Internet, as important tools of information technology, in addition to communication, have various applications in different fields, such that Recharadson (1996, as cited in Pourafshari, 2006) asserted that the Internet has a high undeniable

potential for strengthening educational and learning relations among researchers, academics, students, teachers and learners all around the world (Atraee, as cited in Pourashrafi, 2006). According to Yusuf (2005), these technologies have influenced the quality and quantity of education and solved many inefficiencies of the educational system through improving the teaching-learning process. Some believe that these technologies, more than anything else, have impacted educational and research system and have altered its strategies and methods (Collis & Mooned, 2002). Fry et al. (2008) argued that the use of various forms of information technology is possible through accessing electronic journals, creating discussion groups, expanding communications via e-mail, applying databases to retrieve information, establishing relations with students through video conference, and taking notes during teaching using word processing software. While there is the possibility of easy access to educational sources, the role of teachers has also changes. Teachers are not the only source of presenting the course in the classroom anymore and speeches are not the only educational method. A variety of audio-visual tools such as computers, handheld PCs, digital memos or electronic notes, cell phones, e-mails, and educational software programs, etc. can deepen the teaching-learning process at various levels of teaching. The main objectives of applying these tools are probably changing the procedure of putting emphasis on memory-based learning and moving towards creative thinking and perception of information (Zaraii zavaraki, 2004). According to what was mentioned earlier, therefore, the current study aimed to determine the impacts of ICT on teachers' educational performance.

Methods

Given the nature of the issue and the objectives of the current study, i.e. examining the impacts of information and communication technology on teachers' educational performance, a descriptive-correlational method was applied.

Statistical Population, Sample and Sampling Methods

The statistical population included all second period male and female high school teachers in Chababar (N=198). The sample size, using a stratified random sampling method, was 131 individuals (71 females and 60 males)

Measurement Tools

To collect data, two researcher-made questionnaires on information and communication technology and educational performance were used.

1. Questionnaire on information and communication technology was developed by the researcher through reviewing the literature. It contains 15 items scored based on 5-point Likert type scale (1=very low and 5=very high). Content validity of this questionnaire was confirmed by a number of educational sciences specialists and its reliability was examined using Cronbach's alpha coefficient which was 0.83.
2. Questionnaire on teachers' educational performance was developed by the researcher through reviewing the literature. It contains 31 items and 5 dimensions (involving students in the learning process, establishing relations between teachers and students, identifying appropriate educational methods, recognizing issues disrupting the educational process and solving them, and establishing relationships between teachers and parents). Content validity of this questionnaire was confirmed by a number of educational sciences specialists and its reliability was examined using Cronbach's alpha coefficient which was 0.80. This questionnaire is based on a 5-point Likert type scale from very low to very high.

After confirming validity and reliability of these developed questionnaires, they were distributed among the sample group and adequate explanations were provided.

Data analysis

To analyze the obtained data, one-sample t-test, Pearson correlation coefficient, independent t-test and analysis of covariance were applied.

Results

First question: To what extent do high school teachers in Chabahar use information and communication technology?

To examine this question, one-sample t-test was used, the results of which are presented in Table 1.

Table1: Results of t-test examining the use of information technology

Index	N	Mean	SD	Hypothesized mean	t	df	Sig
Information and communication technology	131	44.15	12.39	45	0.85	130	0.12

Table 1 indicates that mean of teachers' scores on the use of information technology is 44.15 which is close to the hypothesized mean, i.e. 45. Considering the calculated t (0.85) and degree of freedom of 130, this difference is not significant at the 95 confidence level ($p > 0.05$). Therefore, it can be mentioned that statistically speaking, the extent of teachers' use of information and communication technology is moderate.

Second question: How is the status of educational performance of high school teachers in Chabahar?

To investigate this question, one-sample t-test was applied, the results of which are presented in the following table.

Table2: Results of t-test examining teachers' educational performance

Index	N	Mean	SD	Hypothesized mean	t	df	Sig
Involving students in the learning process	131	85.17	39.4	18	97.0	130	12.0
Establishing relations between teachers and students	131	03.18	76.4	18	53.0	130	11.0
Identifying appropriate educational methods	131	89.23	13.5	24	87.0	130	17.0
Recognizing issues disrupting the educational process and solving them	131	90.17	56.4	18	72.0	130	23.0
Establishing relationships between teachers and parents	131	11.15	12.4	15	45.0	130	19.0
Educational performance	131	92.78	23.93	93	0.74	130	0.18

Table 2 demonstrates that mean of teachers' scores on educational performance is 92.78 which is lower than the hypothesized mean, i.e. 93. Considering the calculated t (0.74) and degree of

freedom of 130, this difference is not significant at the 95 confidence level ($p>0.05$). Moreover,

considering dimensions of educational performance, teachers' mean score on involving students in the learning process is 17.85 that is close to the mean, i.e. 18, which regarding the calculated t (0.97) and degree of freedom of 130, this is not significant at the 95 confidence level ($p>0.05$). Teachers' mean score on establishing relations between teachers and students is 18.03 that is close to the mean, i.e. 18, which, considering the calculated t (0.53) and degree of freedom of 130, is not significant at the 95 confidence level ($p>0.05$). Mean of teachers' scores on identifying appropriate educational methods is 23.89 that is close to the mean, i.e. 24, which, with regard to the calculated t (0.87) and degree of

freedom of 130, is not significant at the 95 confidence level ($p>0.05$). Teachers' mean score on recognizing issues disrupting the educational process and solving them is 17.90 that is close to the mean, i.e. 18, which, considering the calculated t (0.72) and degree of freedom of 130, is not significant at the 95 confidence level ($p>0.05$). Additionally, teachers' mean score on establishing relationships between teachers and parents is 15.11 that is close to the mean, i.e. 15, which, considering the calculated t (0.52) and degree of freedom of 130, is not significant at the 95 confidence level ($p>0.05$). Therefore, it can be mentioned that statistically speaking, teachers' educational performance is moderate.

Third question: Does information and communication technology impact educational performance of high school teachers in Chabahar?

To examine the impacts of ICT on educational performance, Pearson correlation coefficient was applied, the results of which are presented in Table 3.

Table3: Results of Pearson correlation coefficient examining the correlation between information and communication technology and educational performance

Variables		Involving students in the learning process	Establishing relations between teachers and students	Identifying appropriate educational methods	Recognizing issues disrupting the educational process and solving them	Establishing relationships between teachers and parents	Educational performance
Information and communication technology	R	0.67	0.51	0.39	0.42	0.44	0.55
	Sig	0.00	0.00	0.00	0.00	0.00	0.00

The results demonstrated in Table 3 indicate that information and communication technology significantly impacts educational performance at the 99 confidence level ($r=0.55$, $p<0.01$). Moreover, information and communication technology positively and significantly influences involving students in the learning process ($r=0.67$), establishing relations between teachers and students ($r=0.51$),

identifying appropriate educational methods ($r=0.39$), recognizing issues disrupting the educational process and solving them ($r=0.42$) and establishing relationships between teachers and parents ($r=0.42$). These impacts are significant at the 99 confidence level ($p<0.01$).

Fourth question: Is there any significant difference between the extent of high school teachers' use of information and communication technology and their educational performance considering their demographic characteristics?

To compare the use of ICT and educational performance of male and female teachers, independent t-test was applied, the results of which are presented in Table 4.

Table 4: Results of independent t-test comparing male and female teachers' use of information and communication technology and educational performance

Variable	Gender	N	Mean	SD	Degree of freedom	t	Sig
Information and communicant technology	Female	71	44.12	3.89	129	0.37	0.61
	Male	60	43.70	3.72			
Educational Performance	Female	71	92.17	3.82	129	0.30	0.24
	Male	60	91.73	3.97			

As demonstrated in Table 4, at the 95 confidence level, there is no significant difference between male and female teachers' use of ICT ($t=0.37$, $df=129$, $p>0.05$). Additionally, at the 95 confidence level, no significant difference is found between male and female teachers' educational performance ($t=0.30$, $df=129$, $p>0.05$).

To examine the difference among teachers' use of ICT and educational performance with regard to their level of education, one-way analysis of covariance was used. The results of this analysis are presented in Table5.

Table 5: Results of covariance analysis examining the difference among male and female teachers' use of ICT and educational performance with regard to their level of education

Variable	Level of education	N	Mean	SD	Degree of freedom	F	Sig
Information and communicant technology	Associate degree	9	44.10	3.89	128	0.43	0.12
	BA	94	43.70	3.72			
	MA	28	92.17	3.82			
Educational Performance	Associate degree	9	92.17	3.82	128	0.39	0.18
	BA	94	91.73	3.97			
	MA	28	44.10	3.89			

The results demonstrated in Table 5 indicate that at the 95 confidence level, there is no significant difference among teachers' use of ICT considering their level of education ($F=0.43$, $p>0.05$). Additionally, at the 95 confidence level, no significant difference is found among teachers' educational performance with regard to their level of education ($F=0.39$, $p>0.05$).

To examine the difference among teachers' use of ICT and educational performance with regard to their years of service, one-way analysis of covariance was used. The results of this analysis are presented in Table6.

Table 6: Results of covariance analysis examining the difference among teachers' use of ICT and educational performance with regard to their years of service

Variable	Years of service	N	Mean	SD	Degree of freedom	F	Sig
Information and communicant technology	Less than 10 years	43	77.15	16.4	2 128	0.43	0.12
	11-20 years	77	64.16	39.3			
	21-30 years	11	63.15	84.4			
Educational Performance	Less than 10 years	43	65.92	07.4	2 128	0.57	0.22
	11-20 years	77	18.92	46.4			
	21-30 years	11	25.92	90.3			

The results demonstrated in Table 6 indicate that at the 95 confidence level, there is no significant difference among means of teachers' use of ICT considering their years of service ($F=0.12$, $p>0.05$). Additionally, at the 95 confidence level, no significant difference is found among teachers' educational performance with regard to their years of service ($F=0.57$, $p>0.05$).

Discussions

The current study aimed to determine the impacts of ICT on teachers' educational performance. Given the theoretical literature and empirical background, four research questions were proposed. The results indicated that teachers' use of ICT was moderate. Therefore, among reasons related to teachers' moderate ICT use, lack of holding workshops and courses on the introduction of computers, ICT, methods of searching and retrieving information, and information literacy, teachers' reliance on print sources of books and texts in education and lack of a positive attitude towards new technologies can be mentioned. This finding is in line with the results of Hajforosh and Orangi (2004) and Khoshkenar (2005) indicating that faculty members' ICT use was moderate.

Moreover, the results demonstrated that teachers' educational performance was moderate. This finding is consistent with the results of Mikamaly et al. who indicated that teachers' performance when managing the classroom was moderate.

Examining the impacts of ICT on teachers' educational performance showed that ICT had great impacts on educational performance of teachers. Additionally, ICT positively and significantly affected involving students in the learning process, establishing relations between teachers and students, identifying appropriate educational methods, recognizing issues disrupting the educational process and solving them and establishing relationships between teachers and parents. Accordingly, it can be stated that the use of ICT can provide students great opportunities of mastering technology and gaining self-governance. In fact, through changing teachers' role from transferor to facilitator, a teacher can provide information to students, facilitating learning activities which result in learning. Skilled teachers can apply information and communication technology in various fields through gaining the required skills and take advantage of the impacts of ICT use in the teaching-learning process. They also can use a variety of technologies relevant and related to the curriculum and content of their course and make the learning process more effective and

attractive. Using information and communication technology in the teaching process may attract students' attention and lead to better learning. These findings are consistent with the results of Farajollahi and Zarifsanæe (2009), showing that information and communication changed teaching thought patterns, enriched the existing educational models and created new methods, and Soleimani et al. (2011) who conducted a study in Ferdowsi University of Mashhad and indicated that there was a direct significant correlation between the extent of faculty members' use of ICT and their educational performance. Loveless et al. (2003) reported that most professors believed that access to the Internet, computer facilities and other equipment related to it should be provided. However, many of them had access to the Internet at home and in the university. Moreover, they mentioned that using the Internet aided them to improve their activities. Devi (2006) indicated that information and communication technology had great impacts on the teaching-learning process. Moreover, the fact that the use of ICT makes learning more attractive for learners is in line with this finding. The results indicated that no significant difference was found considering the extent of teachers' use of ICT and their educational performance with regard to their gender, level of education and years of service.

In today's accelerated world, in which many traditional teaching methods are considered insufficient and slow and do not have adequate power to transfer new concepts to learners, holding workshops and training classes for teachers to enhance their electronic literacy and providing the groundwork for increasing students' learning capacities are highly recommended.

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