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EFFECT OF METHOD OF TEACHING BASED ON TECHNOLOGY ON MOTIVATION AND PERFORMANCE OF ANESTHESIA STUDENTS (RECOVERY PERIOD CARE AFTER ANESTHESIA)

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ABSTRACT

Now a day information and communication technology is able to provide exchange and sharing of information for individuals. Information and Communication technology is an empowering technology used in the medical sciences. This research was performed with the purpose of evaluating the effect of educational technology on motivation and performance of students in the field of anesthesia in the subject of after anesthesia care in patients (stability of cardio-pulmonary signs and level of nausea in patients after surgery and …). This research was quasi-experimental with a pre-test post-test design and a control group. In this study, statistical population included all students in the field of anesthesia of the Azad University of Medical Sciences in the 2014-15 academic year. Data analysis was performed using descriptive statistics including mean, standard deviation and variance and inferential statistics using analysis of covariance for determination of the level of effect of the independent on the dependent variables. Results showed that educational technology is effective on motivation for progress and its constituents (strong motivation for upward movement, interest in retrying, performing the work excellently, high level of aspirations and foresightedness) in anesthesia students. Ultimately, it was shown that educational technology is also influential on performance of students in recovery care. For

example, stability of cardio-pulmonary signs and decreased nausea in patients after surgery and … was better compared to the traditional group.

Keywords: Information Technology, Motivation and Performance of Recovery Care, Anesthesia Students

INTRODUCTION

Information technology by way of changing educational methods has guided the traditional concept of «learning based on memory» towards «creative and dynamic learning». By taking advantage of information technology, teachers easily obtain new educational resources that they need and more simply and rapidly prepare information and educational material for their class (Norouzi et al, 2008).

Research shows that use of computer in addition to increasing motivation in students for learning leads to strengthening of spirits, self esteem and confrontation with problems. Bialou also adds that use of information and communication technology in teaching strengthens the feeling of self confidence, self reliance and endeavor to solve problems and learn. The application of computer as a trainer in combination with traditional teaching for education and development and exercise and presentation of didactics leads to increased learning in traditional courses of basic skills. Students learn faster and learning is encouraged (Elyasi, 2006).

The findings of Hassanpour Dehkordi in a research titled "Role of information and communication technology in development of teaching and science of nursing from the view point of nursing students in the Shahre Kurd University of Medical Sciences" showed that information and communication technology has a very important role in advancement of nursing education. Ninety eight percent believed that information and communication technology leads to increased learning and 88 percent considered it effective on promotion of the status of the nursing occupation.

The results of work by Hills (1977) also considers the reason for educational progress in working with computers and based on the web in medical sciences compared to classes with traditional atmosphere to be attractiveness and increased endeavor by students. Teaching based on computers and the web by way of provision of immediate feedback, personal attention and interesting visual effects motivates learners to learn by way of novel methods that traditional education is incapable of (cited in Najafi,

2008). In a research titled "Correlation between cognitive styles and student progress in learning environments with the help of computer and the traditional environment" performed by Mansouri, the following results were obtained: students with cognitive styles had better performance in learning environments equipped with computers compared to the traditional atmosphere (Mansouri, 2008).

Kulis in a study considers the main factor determining effectiveness of information technology in class on educational progress to be the teacher's skill in use of technology and his or her positive outlook towards technology (Kulis, 2007). Piccoli and colleagues also performed a comparison between electronic teaching and traditional teaching in school classes and in this research, the level of learning and educational progress in electronic teaching was noted to be better than traditional teaching (cited in Ali, 2008).

Motivation for educational progress also is one of the necessities of learning and is what intensifies and guides behavior and helps the learner in its preservation and longevity. With this motivation, individuals take upon themselves the necessary actions for successfully completing an assignment, reach goals or achieve a specific degree of qualification in their work so they can finally obtain the needed success in the matter of learning and educational progress (Yousefi et al, 2009).

Atkinson (1957) considers motivation for progress the product of three constituents need for progress, probability of achieving success and the value of encouraging success. The need for progress is defined as an active condition and an individual's relatively constant endeavor for reaching success which is the same as the sense of pride in completing a task. The probability for success refers to expectation for an action which leads to achievement of a goal and is a mental image or personal belief regarding the chance of reaching a goal. The value of encouraging success is identified by the sense of pride in connection with a specified task. In other words, achieving success in difficult assignments compared to success in simple tasks creates a sense of pride and ultimately, with decreased probability of success, the value of encouraging success increases.

Considering the mentioned and the effect that educational technology can have on motivation for educational progress and also individual's performance, in this research as well, the researcher endeavors to test the following hypotheses:

Research Hypotheses

First Hypothesis: Educational technology is effective on motivation for progress in anesthesia students.

Second Hypothesis: Educational technology is effective on constituents of motivation for progress (strong motivation for upward movement, interest in retrying, performing tasks excellently, high level of aspirations and foresightedness).

Third Hypothesis: Educational technology is effective on performance of anesthesia students in recovery care after anesthesia (stability of cardio-pulmonary signs and level of nausea of patients after surgery and …).

METHODOLOGY

The design of this research was quasi-experimental with pre-test post-test with a control and corroborating group. In this study, two groups of anesthesia students were selected as two experimental and control groups (120 individuals). One group underwent active technological education intervention and the other group underwent regular (traditional) education.

In this research data collection was performed using two measurement instruments.

1. The Hermans' motivation for progress questionnaire and test of performance of students in the curriculum of care after anesthesia in patients (stability of cardio-pulmonary signs and level of nausea in patients after surgery and …). The content of the course selected was taught in the format of an intelligent board, intelligent data and network (internet). In this method the interaction between the learner and professor was two sided along with feedback. In addition to the content and questions, the control group received traditional and teacher centered education and did not have additional teachings. After completion of the teaching sessions, the post-test of motivation for progress and performance questionnaires were administered for both groups. After collection of the information under consideration by the researcher, for data analysis they were entered into the SPSS version 22 software. Data analysis was performed using descriptive statistics including mean, standard deviation and variance and inferential statistics using analysis of covariance for determination of the level of effect of the independent variable on the dependent variables.

Data Analysis

Hypothesis One: Educational technology is effective on motivation for educational progress in anesthesia students.

Evaluation of the mean and standard deviation of the dependent variable of

motivation in educational progress in the two groups of control and experiment in the post-test.

Information in Table 1 shows the mean and standard deviation of the two control and experimental groups in the dependent variable of motivation for educational progress.

Information in Table 2 shows the mean and standard deviation of the two control and experimental groups in the dependent variable of motivation for educational progress with disconsidering confounding variables. In fact, in this table, the means estimated (modified or adapted) are the scores of motivation for educational progress of the two control and experimental groups after controlling for confounding variables, 83/12 and 91/69. Yet, mean of motivation for educational progress in the two control and experimental groups before controlling for confounding variables (Table 1) were 81/46 and 90/35 respectively.

Information in Table 3 shows the results of analysis of covariance (MANCOVA). Based on the information in the table, the level of effect of education with the help of technology on motivation for educational progress in operating room care has meaningful difference with level of effect of teaching by the traditional method (P<0/001). In other words, the difference between the two control and experimental group in effect with attention to teaching with the help of technology intervention on the dependent variable (motivation for educational progress) is meaningful. Teaching with the help of technology has been effective on the level of motivation for educational progress. With consideration of eta square, it can be stated that 0/33 percent of these changes have been due to improvement resulting from the influence of the intervention with teaching equipped with technology.

Hypothesis Two: Educational technology is effective on the constituents of motivation for educational progress (strong motivation for upward movement, interest in retrying, performing tasks excellently, high level of aspirations and foresightedness) in anesthesia students.

Table 1: Mean and standard deviation of the motivation for educational progress in the control and experimental groups' post-test

	Control group		Experimental Group	
Dependent variable	**Mean**	**Standard deviation**	**Mean**	**Standard deviation**
Motivation for educational progress	81/46	9/85	90/35	4/72

Table 2: Modified mean and standard deviation for motivation for educational progress in the two control and experimental groups' post test

	Control group		Experimental Group	
Dependent variable	**Mean**	**Standard deviation**	**Mean**	**Standard deviation**
Motivation for educational progress	83/12	7/94	91/69	6/12

Table 3: Results of analysis of covariance of the difference between the two control and experimental groups in motivation for educational progress

Statistical index / **Source of changes**	**Sum of squares**	**Degrees of freedom**	**Mean squares**	**F**	**Significance**	**Eta coefficient**	**Power**
Pre-test	78/06	1	78/06	1/40	0/24	0/00	0/22
Group	2298/02	1	2298/02	41/19	0/00	0/11	1/00
Error	19360/50	347	55/79	-	-	-	-
Total	2583729/00	352	-	-	-	-	-

Table 4: Results of analysis of covariance of the difference between the control and experimental group in the dimensions of motivation for educational progress

Dimensions of motivation for educational progress	**Statistical index** / **Source of changes**	**Sum of squares**	**Degrees of freedom**	**Mean squares**	**F**	**Significance level**	**Eta coefficient**	**Power**
strong motivation for upward movement	**Pre-test**	6/58	1	6/58	0/30	0/59	0/00	0/08
	Group	665/93	1	665/93	30/13	0/00	0/08	1/00
	Error	7690/93	348	19/77	-	-	-	-
	Total	253187/00	352	-	-	-	-	-
interest in retrying	**Pre-test**	37/90	1	37/90	5/73	0/02	0/02	0/66
	Group	150/49	1	150/49	22/74	0/00	0/06	0/99
	Error	2282/69	345	6/62	-	-	-	-
	Total	120584/00	352	-	-	-	-	-
performing tasks excellently	**Pre-test**	0/00	1	0/00	0/00	0/98	0/00	0/05
	Group	56/17	1	56/17	20/30	0/00	0/06	0/99
	Error	954/67	345	2/77	-	-	-	-
	Total	14906/00	352	-	-	-	-	-
high level of aspirations	**Pre-test**	0/92	1	0/92	0/32	0/57	0/00	0/09
	Group	63/03	1	63/03	21/67	0/00	0/06	0/99
	Error	1003/30	345	2/91	-	-	-	-
	Total	30214/00	352	-	-	-	-	-
foresightedness	**Pre-test**	1/19	1	1/19	0/67	0/41	0/00	0/13
	Group	47/89	1	47/89	26/94	0/00	0/07	0/99
	Error	613/35	345	1/78	-	-	-	-
	Total	14454/00	352	-	-	-	-	-

The information in Table 4 shows the results of the analysis of covariance (MANCOVA). Based on the information in the table, the level of effect of teaching with the help of

technology on the dimensions of motivation for educational progress has meaningful difference with the level of effect of teaching by the traditional method (P<0/001). In other words the differencebetween the two control and experimental groups in effect with attention to the education with the help of technology intervention on the dependent variable (dimensions of motivation for educational progress) are meaningful. Additionally, it can be stated that the difference between the scores of the two control and experimental group demonstrates that the level of effect on the dimensions of motivation for educational progress in teaching with the help of technology in the subject of work and technology in comparison to the regular method in education and development is different. In other words, teaching equipped with technology has been effective on the level of the dimensions of motivation for educational progress.

Hypothesis Three. Educational technology is effective on the performance of anesthesia students in operating room care.

Evaluation of the mean and standard deviation of the dependent variable of educational performance in the two control and experimental groups' post-test.

Information in Table 5 shows the mean and standard deviation of the two control and experimental groups in the dependent variable of educational performance.

Table 5: Mean and standard deviation of educational performance in the two control and experimental groups' post-test

Dependent variable	Control group		Experimental group	
	Mean	Standard deviation	Mean	Standard deviation
Educational performance	3/95	1/46	9/53	0/50

Table 6: Modified mean and standard deviation of educational performance in the two control and experimental groups' post-test

Dependent variable	Control group		Experimental group	
	Mean	Standard deviation	Mean	Standard deviation
Educational performance	7/11	1/34	9/53	0/50

Table 7: Summary of results of analysis of covariance for the difference between the two control and experimental group in educational performance

Statistical index / Source of changes	Sum of squares	Degrees of freedom	Mean squares	F	Significance	Eta coefficient	Power
Pre-test	168/91	1	168/91	183/37	0/00	0/35	1/00
Group	59/21	1	59/21	64/28	0/00	0/16	1/00
Error	319/64	347	0/92	-	-	-	-
Total	21840/00	352	-	-	-	-	-

Information in Table 6 shows the mean and standard deviation of the two control and experimental groups in the dependent variable educational performance with disconsideration of the confounding variables. In fact, in this table means estimated (modified or adapted) of educational performance scores in the two control and experimental group after control for confounding variables were 7/11 and 9/53. Yet, mean educational performance of the two control and experimental groups before controlling for confounding variables (Table 8) were 3/95 and 9/53 respectively.

Information from Table 7 shows the results of the analysis of covariance (MANCOVA). Based on the information in the table, the level of effect of teaching with the help of technology on educational progress has meaningful difference with level of effect of education by the traditional method in after anesthesia care of patients (stability of cardio-pulmonary signs and level of nausea in patients after surgery and …) (P<0/001). In other words, the difference between the two control and experimental group in effect with attention to education equipped with technology intervention on the dependent variable (educational performance) is meaningful.

CONCLUSION, DISCUSSION AND SUGGESTIONS

This study's findings regarding the first hypothesis stating that technology is effective on motivation for progress in anesthesia students agrees with the findings of Daiizadeh and colleagues (2010), Linski (1977) and Elyasi (2006). Use of information and communication technology in increasing educational motivation, promotion of the skill of questioning, strengthening research spirits, and increasing course grades and in total on educational progress of students in the field of anesthesia has been greatly effective.

Findingregarding the second hypothesis stating that technology is effective on the components of motivation for progress in anesthesia students agree with the research by Tajeddin Tajeddin and Nemati Sorkhi (2012) and Zarrabian and colleagues (2010). In the research by Tajeddin Tajeddin and Nemati Sorkhi (2012) which evaluated the effect of education using computers in comparison to the traditional method on the level of learning of non Persian language learners, it was shown that between the two methods of teaching by way of internet and the traditional method meaningful difference exists and using the method by way of the net has significant effect on learning of language

learners. The level of success of the learners in educational courses with the help of computers in comparison to the traditional method has been higher. Their success has been explained based on increased interaction with the teacher by way of the internet which provides feedback and also accessibility of the teacher online and creation of a collaborative environment. In a research performed by Zarrabian titled "Evaluation of electronic learning curricula on the skill of correct spelling in third year of high school students," it was shown that between use of electronic learning program using the net and educational progress of third year of high school students in the subject of spelling and components related to it including visual, auditory and kinetic skills in dictation meaningful correlation exists. Additionally, between educational progress of students in the subject of spelling using the method of teaching in the net and traditional method meaningful difference has been seen (Zarrabian et al, 2010).

Finding of the third hypothesis also shows that technology is effective on student performance in the operating rom.

Therefore, based on the findings of this research, it is suggested that for improvement of student performance in the field of anesthesia, technology be used in their education. It is suggested that in the topics of Bachelor of Science classes teaching IT and the internet for anesthesia students be included. Additionally, conditions should be provided for all students to have access to internet and information banks. Also, attention should be paid to the role of information technology in anesthesia classes.

While technology can improve teaching and learning; yet, only access to it will not improve educational efficiency. Whether a particular institute achieves the potential benefits of technology or not depends on which soft wares are selected, what learners in reality do with the computer soft and hard wares, how professors organize learning based on computers and support it and ultimately is there sufficient technology accessible? Founding an appropriate educational system and decision making regarding ideal application of computer technology, selection of software, professional support and evolution, founding the bases of hardware technology and overall, all components involved, needs a completely cohesive process of planning.

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