

# A Comparative Study of the Effect of Multimedia Teaching Model with Traditional Method on Learning and Satisfaction of Operating Room Students of Hamadan Paramedical School with ENT Surgery Technology Course

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## Abstract

E-learning, including multimedia teaching, is a new approach to providing a learning-based teaching condition. The benefits of using multimedia in educational situations include using multiple senses to learn, practicing more to achieve mastery, facilitating participation to connect concepts, and facilitating repetition of lessons for reuse. This study tends to investigate the effect of multimedia teaching model on learning and satisfaction of operating room undergraduate students of Hamadan University of Medical Sciences with ENT surgery technology course in comparison with traditional teaching method. The present study is a quasi-experimental intervention performed on 38 6th-semester operating room students who were studying in the paramedical department of the Hamadan University of Medical Sciences. The sampling method was census. At the beginning of the semester, the first part of the course was taught traditionally according to the syllabus and the second part of the course was taught by multimedia method using the software provided by the relevant instructor. Multimedia means a simulation software that includes the concepts of anatomy training, familiarity with surgical instruments, and a complete description of ENT surgeries. At the end of both methods, the level of learning and satisfaction of students in both stages were assessed through a written exam and a satisfaction questionnaire and the effect of the designed educational software was compared between

the two groups. Statistical analysis was performed using SPSS software, Ver. 23, and related statistical tests. According to the paired t-test, a significant difference was observed between student learning in traditional and multimedia teaching methods (p-value: 0.038). There was also a statistically significant difference between student satisfaction with the two methods (p-value: 0.000). The results indicate that multimedia method is a more effective method in learning and student satisfaction compared to the traditional method. Based on the results, it was found that the designed teaching software can be an effective teaching strategy to improve the learning of operating room students and increase their satisfaction.

**Keywords:** Multimedia Teaching, Traditional Teaching, Learning, Satisfaction

## 1. Introduction

In the 21st century, quality and method of education has been considered as one of the basic rights in social change and development [1]. Education as one of the ways to transfer concepts, new achievements of science and results of scientific efforts, has been able to take a high step towards learning and improving the performance of learners in the scientific community [2]. Everyone receives information in a special way; thus, incompatible learning-teaching style leads to lack of proper learning [3]. Currently, the predominant teaching method is lecture, in which the lessons are presented in theory and traditionally, with the presence of the relevant teacher in the classroom, while it is one of the oldest teaching methods, called as lecture-based learning [4]. In this way, the teacher attends the classroom, usually without considering the previous background or without creating a basic background for learning, and presents difficult and complex contents, with pictures and slides at its ideal form [5]. In this method, the student has the least opportunity to understand and imagine and look briefly at the images; thus, the need for creative thinking is very low in this method. In the present age, higher education should be dynamic and present its programs in a way that is appropriate to the needs of society and students of science in each field so that graduates of these fields can play their role well in achieving these goals and have the opportunity for self-learning and self-sufficiency in education [6]. Higher education also tends to improve the quality of education by using inexpensive methods. Improving the quality of teaching around the world and in almost all fields of study is one of the important issues in universities [7]. In a study conducted on nursing students, it was shown that 92% of students prefer modern and active teaching methods to common traditional methods [8]. However, it is believed that the implementation of these methods requires educational facilities and spaces and spends a lot of

time, so that its implementation in universities imposes high costs on the educational system [9]. Recently, there have been many reports of the success of e-learning over the traditional method [10]. Arulesmi et al, who simulated the medical education course by multimedia method, enumerated many advantages of the multimedia method [11]. On the other hand, in a study conducted at Tehran University of Medical Sciences in teaching cardiopulmonary resuscitation, the virtual teaching method was compared with the traditional teaching method (conventional method of most universities in the country). The results showed that virtual education was effective on learning (final grades) and student satisfaction, but the two teaching methods were not significantly different [12].

Considering that multimedia-based teaching is very important for specialists and education planners, and since ENT surgery technology course at Hamadan Paramedical School is not offered as a multimedia teaching method, this study tends to compare the multimedia teaching method with the traditional method in terms of learning and student satisfaction with ENT surgery technology course among 6th semester students of Hamadan University of Medical Sciences.

## 2. Materials and Methods

The present study was an intervention performed by quasi-experimental method, in which the effect of two different teaching methods including traditional (conventional) and multimedia teaching was examined. For this purpose, 38 6<sup>th</sup>-semester OR students of the paramedical department of Hamadan University of Medical Sciences in the second semester of 2018-2019 academic year were selected by census method. Participants included students who took the ENT technology course and also had informed consent. Exclusion criteria were unwillingness of students to participate in this study or elimination of ENT surgical technology course. At the beginning of the semester, the course plan and lesson plan were presented to the

students. All participants participated in the study voluntarily and the objectives of the study were fully explained to them and students were assured that all information would remain confidential. The first part of the course was taught traditionally according to syllabus of the ENT surgical technology course and the second part of the course was taught by multimedia method using the software provided by the relevant instructor. Multimedia refers to a simulator software in which concepts of anatomy training related to the ENT surgical technology course are presented with atlas images and animation and training videos, surgical instruments and related surgical sets along with their shape and their exact use, followed by complete description of surgeries in detail and step by step according to valid library and web-based educational resources with the help of expert professors and hospital routine. Another advantage of this software is that links are included in all pages that by clicking on them, we can access the desired educational pages. The software was compiled and finalized after repeated reviews by faculty members. This software was presented to the undergraduate students of the 6th semester in the form of an educational CD.

The level of learning and satisfaction of students in both methods were assessed by a written exam and a satisfaction questionnaire at the end of the course and the effect of teaching software was compared in the two groups. The questionnaire used in this study was a researcher-made satisfaction questionnaire of which formal and content validity were confirmed by professors in this field and its reliability was assessed by calculating Cronbach's alpha. The written exam consisted of 40 questions, 20 of which focused on traditional teaching and 20 questions on multimedia teaching, which were developed by the relevant professor. Finally, the information about the traditional exam scores and scores of the multimedia teaching method and satisfaction with it were compared and analyzed through SPSS software. Central and dispersion indices were used for descriptive statistics and correlation tests were used for inferential statistics ( $P < 0.05$ ).

### 3. Results

In this study, 38 6<sup>th</sup>-semester undergraduate operating room students participated, including 20 girls (52.6%) and 18 boys (47.4%). Their mean age was 23.4 years (Table 1).

**Table 1:** Demographic variables of subjects

Variable		N (%)
Gender	Female	20 (52.6)
	Male	18 (47.4)
Age	22	11 (28.94)

	23	15 (39.47)
	24	8 (21.05)
	25	1 (2.6)
	26	1 (2.6)
	29	1 (2.6)
	33	1 (2.6)
Sum		32 (100)

The mean score of the test obtained from the multimedia teaching was equal to 8.97 and the score obtained from the test related to traditional teaching was equal to 7.89. The results of paired t-test showed that the level of learning in the multimedia method is higher than the traditional method and there is a significant difference between student scores in the two educational methods (Table 2).

**Table 2:** Comparison of student scores in traditional and multimedia methods

Teaching method	Mean	P-value
Traditional scores	7.89	0.038
Multimedia scores	8.97	

Moreover, the mean score of satisfaction with the multimedia method was 75.8 and with the traditional method was 24.3. Comparing the satisfaction with traditional and multimedia teaching methods using paired t-test, the results showed that there is a significant difference between the mean satisfaction score with the two methods (Table 3).

**Table 3:** Comparison of student satisfaction with traditional and multimedia methods

Teaching method	Mean	P-value
Satisfaction with traditional method	24.3	0.000
Satisfaction with multimedia method	75.8	

In other words, the results show that multimedia teaching was more effective in improving student learning and satisfaction with ENT surgical technology course than the traditional teaching method.

### 4. Discussion and Conclusion

This study tended to compare the effect of traditional and multimedia teaching methods on learning and satisfaction of operating room students with ENT surgical technology course. Based on the findings, multimedia teaching was able to meet the expectations of learning to some extent more than the traditional method, so that according to the paired t-test, there is a significant difference between student scores in both traditional and multimedia teaching methods. Moreover, student satisfaction with traditional teaching and multimedia-based method were

examined and compared with each other. The results showed that the satisfaction of operating room students with the multimedia-based method is higher than the traditional method and there is a significant difference. These results are consistent with Daneshmandi et al. who studied the effect of self-help and buddy-aid training through two methods of lectures and multimedia software package on the performance of military personnel [13]. In this regard, Luhnberg et al. studied dental students at the University of Johannes Gutenberg Mainz and showed that multimedia teaching software is more effective than other methods in increasing student preparation for exams [14].

In this study, the findings showed that the mean scores of multimedia method are higher than the traditional method; this may be due to the fact that the presentation in the lecture method did not activate the learners in the process of teaching and learning, and this directly affected the results. However, some studies show that video is more effective than some traditional methods. In this regard, Chen et al. (2009) found that both lecture and video teaching are equally effective, but the results are slightly more effective in video teaching. Recent studies have shown that video teaching can be as effective as lecture and in some cases more effective than traditional teaching in various disciplines [15]. These findings are consistent with views of others who believe that convenience and easy access to educational content through the computer leads to increased learning ability of learners. Moreover, face-to-face teaching in a classroom session leads to a feeling of tiredness and obligation to learn at a specific and predetermined time can lead to a comprehensive limitation in learning [2]. Although in all studies, the characteristic of learning rate was the score obtained from the test, it seems that learning is deeper in the computer-assisted teaching method, considering that the learner takes responsibility for learning; in fact, in this way learners learn how to learn [16]. Various studies have examined the effect of computer-assisted learning in various teachings. In a study by Teasdale et al., using a CD to teach elderly oral health to medical and dental students significantly increased knowledge and skills of participants [17]. The results are consistent with Merajikhah et al. who compared the effect of multimedia tools and traditional methods on learning neuroscience by undergraduate operating room students. In this study, which was performed on 32 operating room students, the rate of student learning, measured using a written exam, was higher in the multimedia method than traditional teaching method [18]. Izadpanah et al. tried to prioritize nine medication management criteria

using FDANP [19]. Findings of Rad and Heidari can be explained by the fact that CDs with short, concise and conceptual information on a specific topic and for a specific purpose can provide learning opportunities appropriate to the time and place desired by learners and have positive effects on education of different groups [20]. Our findings are consistent with Fani et al. who compared the effect of traditional and multimedia methods on knowledge and satisfaction of dental students [21-29].

Multimedia-based learning is one of the active learning methods that can be very effective in teaching surgery courses because students cannot imagine surgery only through mental processes. This method has advantages such as attractiveness, active learning and interest of learners. Although multimedia teaching provides new possibilities for teaching methods, its application has not increased and overuse may reduce communication between teachers and students. There are also disadvantages to this method, including the need for hardware to display it.

According to the findings, it can be concluded that the multimedia software developed to teach ENT surgery technology course can be successfully used as a teaching aid tool for operating room students in addition to other teaching methods such as lecturing. Given that this study was performed only on one group of students, it is suggested that more extensive research be conducted to generalize the results.

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