

The effectiveness of video-based education on gaining practical learning skills in comparison with demonstrating method's effectiveness among university students.

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ABSTRACT

Background: This research was done in the year 2002 in order to compare the effectiveness of video-based education with demonstrating method on gaining practical learning skills. The importance of practical skill learning especially in the branches of medical sciences, the existing contrasts in the effectiveness of educational methods and the advantages of using some methods in learning, facility, rate and expenditure made us think about it as an important subject.

Materials and methods: The research was experimentally done on 40 students of Nursing and Obstetrics education. The samples were randomly divided into 2 groups depending on their educational branch. The pre-test was done in the form of written and short-answer tests in the recognizing domination in order to measure the participants' knowledge, also in the form of a checklist in the psychological domination to measure their skills. Each group was thought one skill by the routine method, demonstration, and another skill by the video-based education method. The skills were changing a wound dressing and washing the hands in the surgical way. The post-tests, similar to the pre-tests, were done 24 hours afterwards and the results were judged statistically.

Results: The total learning rates in demonstrating method were more than the video-based method ($P < 0.043$). The learning rate in the recognizing domination in hand washing using demonstrating method was 16.20 ± 1.5 while using video-based method was 15.25 ± 1 ($P > 0.068$).

The learning rate in the psychological domination in hand washing using demonstrating method was 16.85 ± 1.5 while using video-based method was 15.94 ± 1.4 ($P < 0.026$).

The learning rate in the recognizing domination in changing a wound dressing using demonstrating method was 15.60 ± 1.8 while using video-based method was 15.5 ± 1 ($P > 0.831$).

The learning rate in the psychological domination in changing a wound dressing using demonstrating method was 16.87 ± 1.3 while using video-based method was 16.12 ± 1 ($P < 0.036$).

Conclusions: The routine educational method, demonstration is more effective in practical learning skills in comparison with the video-based education method especially in the psychological domination. It is therefore recommended to apply this method and also to do researches in other skills and in other educational university branches.

Key words: VIDEO-BASED EDUCATION, DEMONSTRATION, LEARNING AND TEACHING.

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Introduction

One of the problems and apprehensions in high education is how to learn different fields and especially different practical skills. This problem is of great importance in the medical university, as knowing about new teaching methods, using educational accessories and getting rid of invaluable traditional methods will help both the

professors and the students to use their opportunities more effectively and also able them to make changes in education (1). Learning clinical and practical skills is the base of a challenging case in Nursing education. If we do not succeed in this field, its harmful consequences will hurt the whole society members especially the patients, university students and the professors (2).

In order to reach their goals, professors use the guidelines of education. Teaching different subjects and skills needs using various methods and techniques. Selecting which methods to use depend on the nature of the task, purposes of learning and also on the students' talent, capability, age and background knowledge. Researchers have found out in their recent studies that the teacher's character has little influence on the process of learning. However, this instructor's way of teaching is one of the most important factors that affect the learning process on the side of the student. It is therefore said, "The instructor's method of teaching is the key to a perfect learning."⁽³⁾

At the moment, the practical skills of the Nursing and Obstetrics are taught in the Educational Skills Center (pratique room)⁽⁴⁾.

The most common difficulties a teacher faces in practical classes are as follow:

- 1- Equipments being damaged or broken.
- 2- Not reaching the correct results in laboratories or in demonstrations.
- 3- Not having sufficient teachers in case students need to be checked or guided.
- 4- Hopelessness and annoyance among students as a result of the above items. (5)

Because of these problems, the greatest part of the national section is spent. Many managers of the educational institutes are actually not sure anymore that the society can bear the high costs and the invaluable results of education. (6)

It seems that the video-based education can be a suitable substitute in this case.

The main question is that whether the video-based education can be as effective as the demonstrating method.

In order to answer that question, this research has been done with the goal: **"The effectiveness of video-based education on gaining practical learning skills in comparison with demonstrating method's effectiveness among university students of Nursing and Obstetrics in Mashad University of Medical Sciences in the years 2001 and 2002."**

Materials and methods

This research is an experimental study in which 2 groups of students have been trained using 2 different methods. How much they learnt was measured and compared afterwards.

The samples of this study were 20 students in Nursing and 20 others in Obstetrics. All 40 students were those who had chosen in the 2nd semester of the studying year 2001-2002 the subject "The Principles and Techniques of Nursing

and Obstetrics". The samples were randomly divided into 2 groups of Case and Control. Afterwards they were matched depending on where they were living and which field they were studying in, so that there were 10 Nursing and 10 Obstetrics students in each group. Besides those who had already passed similar training in those fields and those who had chosen this credit for the 2nd time were omitted from the study.

Tools used for gathering the data:

The measuring tools consists of 3 parts:

A) A written test about scientific elements of the skills with 5 short answer questions about each skill.

B) Checklist: in order to measure the acquired skills of the research units, checklists were used.

C) Questionnaire: contains demographic information, field of education and the university entrance examination's rank. The information was gathered with the help of units participating in the study and also with the help of students' educational files.

Procedure of the research:

This study was designed in a way that it was performed in 3 stages.

A) Assess before training:

Before the training, the knowledge of the participating units was tested through the written test and the checklist. The pre-tests showed that the students hadn't had any background information about the matter.

B) The training stage:

The groups have been trained using video-based method and demonstration in a way that each group has learnt one skill via demonstration and the other skill using video-based education method. The case group is that the one with its members using video-based education method. In this study the cases and controls were chosen randomly, their places changed in a cross manner so that the result was not disturbed in any way.

C) Assess after training:

After training, the students' acquired knowledge was tested using a written test (in recognizing domination) and a skill checklist (in psychological domination). The students performed the hand washing skill on themselves and changed the wound's dressing on a model.

To determine the checklist's validity, the content validity method was used and with the help of Nursing experts measuring tools were matched with our goals in the research.

Checklist is an active and manifested measuring tool. However in order to determine its validity, the reassessing method was used besides asking for experts' advice.

Findings

There were 40 Nursing and Obstetrics students having chosen "The Principles and Techniques of Nursing and Obstetrics" in their 1st semester; 20 M.A Nursing and 20 internship Obstetrics students. Analysis was done on them as shown in the following tables.

The samples' characteristics are shown in table 1 in the form of group 1 and 2. This shows that the students' distributions in the 2 groups were the same from the point of their age, their field of education, the average of their school leaving certificate and their crude biology grade. Were they not exactly the same, they had so little differences that were not statistically noticeable at all.

TABLE 1: The distribution of the units in groups depending on their demographic information

Groups Factors	Group 1	Group 2	Result
Single	19	18	
Married	1	2	
Resident in dormitory	13	13	
Personal house	7	7	
Age	20.65±1.39	20.30±1.17	P > 0.36
Average of School leaving certificate	15.84±1.1	16.06±1.22	P > 0.97
Grade in biology	35.53±14.22	34.3±12.86	P > 0.42

The comparison between video-based education and demonstration is shown in table 2. This table shows that the students' grades are more in the demonstrating method in both skills.

TABLE 2: Comparison of students' average and standard deviation of their theoretical and practical points based on the skill training method.

Skill Method of training	Hand washing	Changing the wound's dressing
Demonstration	16.63±1.2	16.78±1.1
Video	15.59±0.97	15.86±0.91
Result	P < 0.025	P < 0.033

In order to compare the effectiveness of video-based education with the demonstrating method in the recognizing domination, table 3 was arranged. Table 2 shows that students learn the 2 skills better

and more effective using the demonstrating method rather than the video-based educational method although the difference is not noticeable.

TABLE 3: Learning among students in recognizing domination based on the training method and the skill trained.

Skill Method of training	Hand washing	Changing the wound's dressing
Demonstration	16.20±1.5	15.60±1.8
Video	15.25±1	15.5±1
Result	P > 0.068	P > 0.831

Table 4 was arranged to compare the effectiveness of video-based educational method with the demonstrating method on learning among students in psychological domination. Table 3 shows that students' grades are more in both skills in the demonstrating method rather than the video-based method.

TABLE 4: Learning among students in psychological domination based on the training method and the skill trained.

Skill Method of training	Hand washing	Changing the wound's dressing
Demonstration	16.85±1.5	16.78±1.3
Video	15.94±1.4	16.12±1
Result	P < 0.026	P < 0.036

Discussion and conclusion

Studying table 2 shows that the grades of the 2 groups have been more in the demonstrating method.

Results show that training through video is not as effective as demonstration. The students' grades, however, were high enough in both ways. Video-based educational method can be a suitable substitution when we are not able to perform the demonstrating method or when it is not cost-effective. Some studies have shown that video-based educational method is more effective than some traditional methods. Chen and colleagues, also Schare and colleagues have found out that video presentation is as effective as lecturing and the results were even a little better in the video presentation. Recent studies have shown that video-based education can be as effective as lecture-based instruction and even sometimes better than that in different fields (7).

In another study, Momen Nasab and colleagues found out that learning among cases trained by

video was good, whereas it was average among controls trained by lecturing (8).

Beside the mentioned points, the study's findings show that video-based education is not as effective as demonstration. Some points are to be discussed:

1. The difference in content: The offered contents are brief in skill training.
2. Time of lecturing: The time used in demonstration is less than what can cause tiredness. Azizi (1992) writes: Studies have shown that the maximum learning ability among students is achieved during the first 20 minutes of the lecture (9).

Table 3 shows that learning is more probable among students who have been trained by demonstration, their theoretical grades have been higher in both of the skills too, although the average difference testing doesn't show any considerable differences.

Table 4 has been arranged to show learning rates among students in psychological domination. It shows that those who have learnt the hand washing skill through demonstration have higher grades than those who have been trained by video. The average of the practical grades in hand washing skill by demonstration was 16.85 ± 1.5 and by video it was 15.94 ± 1.4 and the average difference testing shows considerable differences.

Also in the skill "changing the wound's dressing", the group 1 grade was more than the other group that were trained by video. The average of the practical grades in this skill by demonstration was 16.78 ± 1.3 and by video it was 16.12 ± 1.3 4 and the average difference testing shows considerable differences. Bowl (1998) writes: Many new methods such as audio and videotapes have been used in clinical skill education during the 2 recent decades (10). Rouzbehi and colleagues (2000) have also done a research about comparing the effectiveness of training videotapes with CDs in teaching Anatomy to medical students. They have reported the followings: Students who have watched videotapes about abdomen and pelvic anatomy besides participating in classes; working with cadavers and studying on models have had better theoretical and practical grades, but there were no meaningful difference between the groups (11).

Many researches have been done about using videotapes in education and the results have been all positive. But it is not the same in different fields, as it is considered to be better than lecturing in basic sciences such as Physics and Chemistry, whereas it has not been thought to be valuable in languages and literatures (12).

As it has been already mentioned, this study shows that students learn more effectively using demonstrating methods. Ahadian (1998) writes from Edgardil: direct, manifested and first-hand experiments are more effective than slides and films and these are more effective than signs and symbols (like words) (13).

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