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Comparison of Compositing Training with Simple Training in Learning of Theoretic Microbiology in the Students of Arak University of Medical Sciences in Iran

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Abstract: The rate of learning is dependent on teaching method. Now a day teaching methods based on soft wares have increasingly trend. In this study, back ground subjects in microbiology presented on cards. These information were given to the students before the formal class along with using power point software to make the students ready in order to achieve higher level of learning (Compositing training). Rate of learning was evaluated comparing the compositing training and using no cards (Simple training), based on students' average performance in class tests. In this interventional semi experimental case control study, 200 medical students were evaluated in two random groups. The case group was taught using back ground information presented on cards along with power point software(Compositing training) while the control groups were taught using just power point slides (Simple training). Evaluating the effectiveness of teaching in these two groups was done through class tests and final exam. The average gotten grades were recorded as learning criteria. Data were evaluated with SPSS version 15 and t test. Finding showed that the average grades of quizzes in medical students in simple training were 14 while in compositing training was 17. For B.S students the average grade in simple training was 15 and for compositing training it was 17. In midterm exam the average grade of medical students taught with simple training were 14.5 while for compositing training it was 15.5. In final exam for medical students, the average grade was 17 in simple training and 16.5 in compositing one. For B.S students receiving simple training the average grade was 17 and it was 16.5 in compositing one. In the case of students' class activeness and class discussion participation, students receiving compositing training were more motivated and active in class. Compositing teaching method causes a promotion in learning process especially in B.S students and also it makes the students more active in theoretical classes.

Key words: Simple Training · Compositing Training · Power Point · Microbiology · Medical Sciences Students

INTRODUCTION

Blended learning is considered a hot topic, but is simply defined as a combination of traditional learning and some form of e-learning [1]. By blending the process of action learning to support the use of the student on an international placement alongside an online synchronous tool such as Skype, then students can meet the challenges of learning from experience and develop adaptive competence, keeping them on placement overseas instead of returning home [1,2]. Through a blended learning approach, technology will be more important. In other circumstances, a greater reliance on technology within the classroom may occur. Activities may be structured around access to online resources, communication via social media or interaction with distance learners in other classrooms or other learning environments [2].

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There are many different approaches to blended learning. It can take on many shapes or forms, depending on the teachers and learners involved. As of now, there is no consensus on a single agreed-upon definition for blended learning. The terms "blended," "hybrid," and "mixed-mode" are used interchangeably in current research literature [3].

Blended learning has been around for many years, but the name has changed as the uses and recognition have increased. Many people may be using a form of blended learning in lessons and teaching, but may not realize it or be able to give it an actual name. Blended learning is something that is used in the world of education as well as the world of business. Blended learning is not a new concept, but may be a new term to many users [4].

The facilitator can combine two or more methods of teaching. A typical example of blended learning methodology would be an integrated combination of technology-based materials and face-to-face sessions to present content. An instructor can begin a course with a well-structured introductory lesson in the classroom and then proceed with follow-up materials online. Blended learning can also be applied to the integration of e-learning with a learning management system (LMS) using computers in a physical classroom, along with face-to-face instruction [5, 6].

What Is Active Learning and Why Is it Important?: Active learning an attempt to make education culturally relevant to the current generation of learners, traditional approaches to classroom management may no longer suffice and it is increasingly important to understand how others are successfully implementing curricular innovation. Most important, to be actively involved, students must engage in such higher-order thinking tasks as analysis, synthesis and evaluation. Within this context, it is proposed that strategies promoting active learning be defined as instructional activities involving students in doing things and thinking about what they are doing [7].Use of these techniques in the classroom is vital because of their powerful impact upon students' learning. For example, several studies have shown that students prefer strategies promoting active learning to traditional lectures [8].

Other research studies evaluating students' achievement have demonstrated that many strategies promoting active learning are comparable to lectures in promoting the mastery of content but superior to lectures in promoting the development of students' skills in thinking and writing [9-11].

Further, some cognitive research has shown that a significant number of individuals have learning styles best served by pedagogical techniques other than lecturing [4, 12, 13].

Therefore, a thoughtful and scholarly approach to skillful teaching requires that faculty become knowledgeable about the many ways strategies promoting active learning have been successfully used across the disciplines. Further, each faculty member should engage in self-reflection, exploring his or her personal willingness to experiment with alternative approaches to instruction [14].

Power point is one of the common soft ware for computerize presentation of educational contents. The effectiveness of this method is depending on quality of slides and other circumstances of educational states. Moreover PowerPoint can be a useful tool when it is used to display images that students normally would not be able to see or when instructors use it as an outline to keep them focused on their lectures and also give the students an idea of what to expect [1-2].

Roos and collegue in study about developing medical educators-a mixed method evaluation of a teaching education program showed that the success of the educational intervention at all observed levels. 1) Reaction: The participants showed a high acceptance of the instructional content. 2) Learning: There was a significant increase in knowledge as deduced from a pre-post multiple-choice questionnaire, which was retained at 6 months. 3) Behavior: Peer-, self- and expert-assessment indicated a transfer of learning into teaching performance. Semi structured interviews reflected a higher level of professionalism in medical teaching by the participants. 4) Results: Teaching performance ratings improved in students' evaluations [15].

By considering the drive for continuous improvement in medical education is propelled by both advancements in educational theory and research evidence, which is subsequently changing the traditional requirements of a medical educator. Therefore the aim of this study was comparison of compositing training with simple training in learning of theoretic microbiology in the students.

MATERIALS AND METHODS

This is a quasi experimental case control study done during 10 months period in Arak University of medical sciences. Study is designed to compare the effects of two educational methods: simple and compositing training for teaching of theoretic microbiology.

200 students of different fields (students of general physician, lab sciences, nursing and midwifery) were enrolled and divided in two equal groups. The case group was 1oo students of different fields were educated by compositing training. In case group background information was educated by information cards previously and specialized information was presented in power point slides in formal class. Control group was matched in sample size and other criteria of case group. These students were taught just by lecturing and Power Point (PPT) slides.

Contain volume of information cards were10-15 short cut phrase. It was an opportunity for students to read them without much time spending.

One of the most important problems in this study was selection bias (Popularity bias) which has been defined as the tendency of the students to the information cards as the source of the final exams questions. To settle this problem, students have been informed that this mentioned explanations are only pilot information to access the specific data.

Internal queues, midterm and final exams were applied for evaluation of training methods in learning of theoretic microbiology. The exams score averages were used to determine their academic improvement. Having been entered into spss-15, data were analyzed by statistical method (T student). Educational arguments as a class motivation index and qualitative criteria were recorded in case and control groups.

Questionnaire was designed for evaluation of viewpoints of student about two mentioned educational methods. Validity and reliability of this questionnaire was measured by flow chart and code sheet designing, in pilot study. Face validity, construct validity and reliability of the questionnaire were confirmed.

In this present study, ethical considerations were regarded (lack of educational deprivation and prosperity of equal learning situation) and ethical code: 89-97-7 was registered in Arak university of medical sciences in Iran.

RESULTS

From 200 students these results were concluded: Sample distribution according to sex; 71% were female, 29% were male. Sample distribution according to educational course; 31% were students of general physician, 69% were studied in bachelor's degree.

A1- The marks average of exams score in internal queues of medical students that educated by simple training was14 (SD: 2.5) and in students that educated by compositing training was 17(SD= 3.1). p=0.024

A2-The marks average of exams score in internal queues of bachelor's degree that educated by simple training was 15 (SD: 3) and in students that educated by compositing training was 17.5 (SD= 4, p=0.028).

B1-Result of midterm exams showed that in medical students that educated by simple training, the marks average was 14.5 (SD: 3.5) and in students that educated by compositing training was 16.5(SD= 3.3). p=0.32

B2-The marks average of exams score in midterm exams of bachelor's degree that educated by simple training was 14.5 (SD: 4) and in students that educated by compositing training was 15.5 (SD= 2.5). p=0.075

C1-Result of final exams showed that in medical students that educated by simple training, the marks average was 16 (SD: 3.8) and in students that educated by compositing training was 16.5(SD= 4). p=0. 20

C2-The marks average of exams score in final exams of bachelor's degree that educated by simple training was 17 (SD: 3.7) and in students that educated by compositing training was 16.5 (SD= 4.1). p=0.070

Mean and SD of different exams of students were taught by simple and compositing training summarized in Table 1.

Students' class activeness and class discussion participation as major educational indexes were high in compositing training groups. This objective and qualitative result was demonstrated in medical students specially.

DISCUSSION

Considering the results achieved by this study, the following comments are valuable to be presented. In the case of average marks of quizzes and oral questions, used as one of the evaluating index both the medical students and bachelor students receiving compositing method had higher grades than those receiving simple training.

These significant differences showed that giving background information using cards can make students remember the information easier and for longer time. In other words, receiving information from two sources has a promoting role in learning process. These results of course decline the fact that transferring information written on cards provides getting higher information in a short if time and just for a part of the whole content being taught in one term. But it may have less or no effect on other aspects of learning such as lasting of information permanently or achieving higher level of knowledge and even a long term memory.

Table1: Mean and SD of different exams of students were taught by simple and compositing training

Groups												
Marks	Final Exam				Midterm exams				Queueses			
	Bachelors students		Medical students		Bachelors students		Medical students		Bachelors students		Medical students	
	C-T*	S-T**	C-T	S-T	C-T	S-T	C-T	S-T	S-T	S-T	C-T	S-T
Mean	16.5	17	16.5	16	15.5	14.5	16.5	14.5	17.5	15	17	14
SD***	4.1	3.7	4	3.8	2.5	4	3.3	3.5	4	3	3.1	2.5
P	0.070		0.20		0.075		0.032		0.028		0.024	

*C-T: Compositing Training, **S-T: Simple Training, ***SD: Standard Deviation

In the case of time there is a meaningful and significant relation between getting information and taking test.

As it was mentioned above, the average marks of the students receiving compositing method were higher than those of students being taught by simple classic method. In spite of a little increase in average grades of compositing groups, no meaningful difference was seen between the two groups in the case of improving learning or understanding for the students of associate of art.

The reasonable explanation for this result can be driven from this fact that most students tend to get information from the pamphlets and their class notes which reflect the professor's speech or in this study information presented by slides. For getting higher grade, the students relay more on their teacher speech than other sources of information. Students of bachelors are more eager toward pamphlets and class notes but for medical students it seems that back ground knowledge and other educational sources and complementary information are important.

Regarding this matter that final test is based on the whole materials being taught, it can be a more notable criterion for evaluation of these two different methods. In the case of promotion of learning, as it was told before in the result section, there is no significant difference in grades comparing the two groups.

The other criterion which was evaluated in this study is the amount of students' interaction and their involvement in theoretical classes. In comparison with students receiving simple method, medical students and bachelor students' action criterion increased since the class discussion was based on the materials presented on cards; therefore they were more attentive and ready to be active in the discussion.

Unfortunately due to limitation of time it was not possible to discuss previous materials so we can not comment about the duration of this interaction for all materials presented during a whole term but relating on the result of final exams we can say more strongly that using compositing method has more effect in motivating student reaction in class. Results show that this effect is more in a short period of time.

Many investigations have been done a bout using additional techniques along with usual teaching strategy, which some of them are similar to this study [16-19].

Evaluating those investigation related to our study is important in several cases which will be discussed below. In Navae's study [16] nursing students were given a CD containing self teaching of electro cardio graph monitoring in order to plan an educational method based on a student's based strategy. The similarity of this study to ours was presenting students with a self teaching material which was a compact CD, but in contract with our study the result showed that %100 of students were satisfied with this method but the effect of this method on learning was not evaluated to be compared with our study.

In Mojtahed zade's study [20], electronically educating was taken in university educational system by making an educational site in internet. The results showed that promoting of learning was noticeably increased but as his source of information was an electronically one, the way of using it is logistically hesitating. Active learning is one of the noticeable concepts in education [21].

In our study active participation of learner was obvious in class discussions. The result of some researches for example Rikhteghar-Bilan from Tabriz university of medical sciences and Ranghraz-Nouri from Shahid Beheshti university of medical sciences have coordination with our study [22, 23].

This coordination show that any positive intervention such as case based learning, competent based learning and problem based learning is very important and is effective in active learning achievement.

CONCLUSION

Based on many studies, we can dearly say that most educational intervention along with usual classic learning has positive effect on improving learning process and student active learning but it is not clear if this compositing teaching has any effect on other aspects of learning such as attitude and cognitive learning.

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