Teaching Efficiency
Ефективност на обучението

STUDENT PERFORMANCE IN A SEMINAR BASED EXAMINATION OF BASIC BIOCHEMISTRY COURSE

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Abstract. One of the major duties of any lecturer is to adopt different teaching methods in order to obtain excellent student performance. This study was conducted to investigate the performance of students in a seminar based examination compared to a lecture and practical sessions based examination. The basic course of biochemistry, taught to 35 students of chemistry and biology of the faculty of science at King Khalid University, was conducted following three teaching methods; lectures, practical sessions and seminar based teaching. Vitamins were taught through seminars prepared and presented by the students while the amino acids, protein and enzymes course was delivered through lectures and practical sessions. The final exam of the course included questions testing the knowledge of the students concerning the seminar and lecture based information. Regarding the results of the seminar based questions; 15 (42.9%) passed the exam and the range of the marks was (25- 90) while the students who passed the lecture and practical sessions based questions were 17 (48.6%) and the range of the marks was (35- 80). However, the pass mark was 60%. Although the highest marks were scored in the seminar based questions, the general performance of the students in the seminar based questions was poor compared to the lecture and practical sessions based questions.

Keywords: teaching methods, seminar-based, lecture-based

Introduction

In order to implement an effective course and to obtain better students' outcome, different teaching methods should be followed. Teaching methods can be classified to two classes; teacher centered and student centered. The teacher centered teaching methods include the classic ones like lectures, the classic way of delivering a practical session and tutorials. The teaching and the student learning processes in the classic teaching methods depend mainly on the teacher as the major source of information. However, Hancock et al (2002) concluded that teacher-centered education has the following criteria which depend mainly on the teacher since: he is the dominant leader who establishes and

enforces rules in the classroom, he structures learning tasks and establishes the time and method for task completion, he states, explains and models the lesson objectives and actively maintains student on-task involvement, he responds to students through direct, right/wrong feedback, uses prompts and cues, and, if necessary, provides correct answers, he asks primarily direct, recall-recognition questions and few inferential questions and he summarizes frequently during and at the conclusion of a lesson.

The student centered teaching methods depend mainly on the student for searching for information and the teacher is a facilitator and a vehicle for checking the accuracy of information. However, there are different definitions of the student centered teaching, but the best describing and the most comprehensive definition is that of Lea et al. (2003), who mentioned that, the student centered teaching includes the following points; the reliance on active rather than passive learning, emphasis on deep learning and understanding, increased student responsibility and accountability, increased sense of autonomy in the student, interdependence between teacher and learner, mutual respect within learner teacher relation and a reflexive approach to the teaching and learning process on both the teacher and the student. Examples of student centered teaching methods include problem based learning sessions (Boud & Feletti, 1997), seminars (Weurlander et al, 2009; Spruijt et al., 2012), exercises and group discussion, Computer Assisted Learning (CAL), field work including research and writing newspaper article (O'Neil & McMahon, 2005). However, it is stated that student centered learning can be done through the lectures like buzz groups, student class presentations, role play and poster presentations.

Teacher-centered education is based on an active teacher and a passive student. In contrast, learner-centered education is based upon the idea of an active student and a facilitator teacher (Mascolo, 2009). However, the teacher centered teaching methods can be conducted in small or large student groups but the student centered is better conducted in small groups.

A seminar is a student centered teaching method

Jaarsma et al. (2008) defined the seminar as learning session in which a group of some 25 students facilitated by a content expert discusses questions and issues emerging from assigned readings on a topic of practical relevance**.** Seminar sessions are considered as student centered teaching method and they are used for the purpose of developing the teaching process and for integrating curricula in both under and post graduate programs (Zsohar & Smith, 2010; Weurlander et al., 2009).

Seminar sessions are affected by seven factors; the seminar leader or teacher, students, preparation, group functioning, seminar goals and content, course schedule and facilities (Spruijt et al., 2013).

From my experience I can say that the seminar session is so complicated student centered education method because a lot of efforts should be done in: preparing for the seminar, setting the objectives, ensuring that all the students actively participate in the seminar and evaluating the students' performance

Formative evaluation for the students in a seminar session is very difficult since it so difficult to distribute equal responsibilities between the students. Active students mostly dominate the seminar sessions and the passive ones rarely participate in the seminar discussions. A summative evaluation can conducted at the end of each seminar course.

Objectives

The aim of this study was to investigate the performance of undergraduate science students at King Khalid University in a biochemistry seminar based course compared to their performance in a biochemistry lecture and practical sessions based course.

Material and methods

Ethical issues

This study was conducted after approval from the authorities of King Khalid University and the results of this article were orally presented in the 10th research day of the university.

Study population and description of the seminars process

The basic course of biochemistry was delivered for 35 science students of chemistry (4) and biology (31) at king Khalid university in Abha- Saudi Arabia during the first semester of the academic year 2013- 2014 (1434- 1435 Hijri- Moon year). The course was implemented following three teaching methods lectures and practical sessions as a teacher centered education methods and a seminar as a student centered teaching method. The amino acids, proteins and enzymes course was conducted through lectures and classic practical session (the teacher is the center of the practical) and the vitamins course was conducted through seminars. Regarding the setting of the seminar; the objectives of the seminar course were obtained from the basic biochemistry course objectives and were distributed to the students, each student presented a PowerPoint lecture meeting specific objective, the students prepared materials were seen and approved by the course coordinator and the seminars were done in a well equipped room at King Khalid University. However, the discussion and questions of the seminars were not well organized, only three students participated in asking questions and discussing issues presented by their colleagues.

The structure of the exam and the marking process

Formative and summative evaluations were conducted for the vitamins and for the amino acids, proteins and enzymes. The marks were divided equally between the formative and summative evaluations (50 marks each)

The formative evaluation of the students in the seminars was calculated by the summation of the prepared material, the oral presentation and the response to the questions and discussion marks while the formative evaluation mark of the lectures and practical sessions was calculated from the response to the questions in the lectures and practical sessions, the laboratory reports and the practical exam.

The summative evaluation was composed of three types of questions; Multiple Choice Questions (MCQ), correct answer questions and short answer questions. Each multiple choice and correct answer questions were composed of a stem question with four answers options. Wrong answers in the multiple choice questions were penalized by -1/2.

Results and discussion

The performance of the students in the two exams was comparable. The highest and lowest marks were scored in the seminar based examination. The general performance in the lecture and practical based exams was better than the general performance in the seminar based examination; the success percentage were 48.6% and 42.9% respectively. The results are summarized in Table.1 **.**

Table.1. Ranges of marks and number successful students and their percentages in the seminar and the lecture and practical sessions based examinations

	Range of marks	Number of students who passed the exam	Percentage
Seminar based examination	(25- 90)	15	42.9%
Lecture and practical sessions based examination	(35- 80)	17	48.6%

The poor performance in the seminar based examination may be due to: it is the first time for the students to experience learning through seminars in specific and student centered teaching in general, the teacher is not well trained in organizing and managing a seminar, the preparations of the students was not well done and the questions and discussion during the students presentations were randomly done. The above mentioned factors are the major factors that affect the seminars (Jaarsma et al., 2009). Another

negative side of this study is that it did not investigate the opinion of the students about the seminar course, its organization and whether they benefited from it or not.

The most interesting issue is that, the students who scored the highest and lowest marks in the lecture and practical sessions based exam were the same students who scored the highest and lowest marks in the seminar based, i.e., the performance of the active, serious and excellent students was better in the seminar based exam while the performance of the passive and weak students was better in the lecture and practical sessions based exam.

All the contacted previous studies investigated the perceptions of the students and teachers about seminar courses, no study was found tackling the performance of the students in a seminar based examination or any other student centered teaching method.

In a study aimed to investigate the opinion of the students about the clinical seminars in the university dental hospital of Manchester compared to classical lectures, Brunton et al. (2000) found that the student prefer seminar based learning opposed to the lectures.

Conclusions

Students' performance in the seminar based examination is poor opposed to lecture and practical session based exam. The active and excellent students' performance was better in the seminar based exam while the passive and weak students performance was better in the lectures and practical session based exam.

Recommendations

For a seminar to be an effective teaching method it should be preceded by well prepare from the teacher and students and it should be well organized. In the questions and discussion session each student should be nominated as presenter and discusser to facilitate better interaction between the students.

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