

MOTIVATION TO LEARN PHYSIOLOGY USING END OF LECTURE QUIZZES

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هدف الدراسة: تعتبر الامتحانات من العوامل المحفزة للطلاب على التعلم ، وقد قمنا في هذه الدراسة باستثمار هذه الحقيقة لرفع معدلات الحضور والانتباه لدى الطلاب في المحاضرات.

طريقة الدراسة: تم عمل امتحانات في نهاية كل محاضرة على المادة التي غطيت وشرحت في تلك المحاضرة . ثم عمل 12 امتحان كل منها يتكون من 4 أسئلة اختيارية وجميعها على الجهاز اليولي من مقرر وظائف الأعضاء . وطلب من الطلاب (137 طالب وطالبة) في نهاية الدارسة تعبئة استبيان مكون من 18 سؤالاً اختيارياً مع بعض الأسئلة المفتوحة

نتائج الدراسة: تبين أن الطلاب قد استمتعوا كثيراً بالدارسة ويفضلون هذه الطريقة بل ويدعون إلى تعميمها على سائر مقررات الكلية . غير أن بعض الطلاب ذكروا بعض السلبيات التي يمكن أن يتم تفاديها

الخلاصة: يمكن أن نخلص من هذه الدراسة بأن الامتحانات القصيرة في نهاية المحاضرة على محتوى تلك المحاضرة مفيدة في استقطاب حضور أكبر من الطلاب للمحاضرات وكذلك في زيادة تركيزهم واستعابهم على أن تكون هذه الامتحانات عشوائية ويعطى للطلاب الأجوبة الصحيحة لهذه الأسئلة كما يمنع ويقلص الغش قدر الإمكان .

الكلمات المرجعية: علم وظائف الأعضاء، تحفيز الطلاب، الامتحانات، الطب، المملكة العربية السعودية.

Objectives: Exams are known to be strong external motivators for study. In this study, this observation was utilized to increase the attendance and attention of students in lectures.

Methodology: Tests were conducted at the end of every lecture, on the material covered in that lecture. A total of 12 tests on renal physiology, consisting of 4 MCQs each, were done. Students (137 male & female) were requested to fill a questionnaire of 18 items, rated on a 5-point scale in addition to some open questions.

Results: Analysis of the 137 questionnaires showed that students who had participated had found it enjoyable. However, some students pointed out certain disadvantages in the practice.

Conclusion: It is concluded that end-of-lecture quizzes are an extremely useful stimulus for motivation provided they are random, answers are given, and cheating is minimized.

Key Words: Physiology, Student's motivation, Exams, Medicine, Saudi Arabia.

INTRODUCTION

The outcome of academic work at the tertiary level is influenced by student ability, opportunity to study, curriculum design, teaching standards, staff-student ratios, course load, learning strategies and educational facilities. These are all important factors. However, a student's motivation for learning is arguably the most influential.¹ Motivation could be looked at as a physiological drive spurring a person, or an animal, to behave in a certain way.² There are two types of motivation: extrinsic and intrinsic. Extrinsic motivation is linked to reward or punishment while intrinsic can be related to the satisfaction of an inner need.² Exams fall into the category of extrinsic motivation.³ Frequent testing in a physiology course has been evaluated by 73% of students as one of the main motivating factors.¹ The aim of the

present study was to test the effect of end of lecture quizzes on students' motivation.

METHOD

A total of 137 second year medical students (74 male and 63 female) at King Faisal University, Dammam, participated in the study. A test consisting of 4 MCQs (single best with 4 statements) was given at the end of each lecture on the material covered in that lecture, the 12 lectures on renal physiology. Therefore, students were not given a chance to revise the lecture material. MCQs were based on basic factual and conceptual knowledge. Tests took five minutes and were given in two versions. At the end of the trial period, students filled a questionnaire which consisted of 18 items rated in a five-point scale system and some open questions (Table 1).

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Table 1: Questionnaire – Male students' responses to the following items regarding the evaluation of short quizzes at the end of lectures on renal physiology

No.	Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Enhances preparation for lectures	28	21	24	10	1
2	Enhances lecture attendance	59	17	7	-	-
3	Enhances concentration	45	35	4	-	-
4	Increases knowledge acquirement	34	37	9	3	-
5	Consolidates knowledge	30	33	15	3	-
6	Corrects wrong concepts in students' mind	20	33	19	8	1
7	Clarified unclear (ambiguous) points	12	26	32	5	1
8	Creates fear and anxiety during lecture	12	20	15	28	9
9	Makes lecture unenjoyable	3	8	23	31	13
10	Incorrect scale for student level	17	28	18	16	4
11	Does not reflect true student level	20	32	18	8	4
12	This idea should be applied to all courses	20	19	25	11	10
13	Only suits courses that depend mainly on understanding	37	16	18	7	6
14	Does not suit courses which depend more on memorization	42	10	11	12	4
15	Number of questions is convenient	38	34	8	1	1
16	Cheating was not significant	5	14	31	17	16
17	MCQs are convenient	60	19	2	2	-
18	Better to use short answer questions	2	9	14	22	35

Table 2: Questionnaire – Female students' responses to the following items regarding the evaluation of short quizzes at the end of lectures on renal physiology

No.	Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Enhances preparation for lectures	11	1	27	20	9
2	Enhances lecture attendance	57	11	1	-	-
3	Enhances concentration	54	16	1	-	-
4	Increases knowledge acquirement	41	23	6	1	-
5	Consolidates knowledge	37	24	6	1	-
6	Corrects wrong concepts in students' mind	36	19	12	1	1
7	Clarified unclear (ambiguous) points	25	22	15	4	1
8	Creates fear and anxiety during lecture	3	11	8	28	19
9	Makes lecture unenjoyable	2	7	13	25	20
10	Incorrect scale for student level	22	26	12	7	3
11	Does not reflect true student level	24	26	14	3	2
12	This idea should be applied to all courses	16	10	13	16	14
13	Only suits courses that depend mainly on understanding	39	17	4	6	2
14	Does not suit courses which depend more on memorization	44	15	-	7	3
15	Number of questions is convenient	39	29	1	-	-
16	Cheating was not significant	10	23	-	1	-
17	MCQs are convenient	50	18	-	1	-
18	Better to use short answer questions	-	4	3	22	40

Students performance on the major quiz in this course was compared to their performance in the other three quizzes, conducted during the year, on other parts of the course. Performance in the questions of the final exam on the renal system was compared to two other major systems covered (respiratory and endocrine).

RESULTS

Most students (both male and female) thought that such tests enhanced lecture attendance,

concentration during lectures as well as knowledge acquisition. The majority also rated these tests as consolidating knowledge, correcting wrong concepts and clarifying ambiguous (unclear) points (Tables 1 and 2). However, while most males agreed that these tests enhanced preparation for lectures and should be applied to all other courses taught in the college, most female students disagreed with this. On the negative side of the evaluation, most students (both genders) disagreed with the statement that the tests made lectures

unenjoyable, were an incorrect measure of a student's level and did not reflect true level of the student. Students thought that this practice was suitable for all courses regardless of the course content since it required understanding (e.g. physiology) or memorization (e.g. Anatomy). Most students were satisfied with the content and the format used in the study, but preferred MCQs over short answer questions. A third difference between male and female students was on the evaluation of cheating. Most male students thought that cheating was significant while most females did not.

Table 3: Comments of both male and female students

Comment	Number
Excellent	31
Good/Very Good	18
Successful	10
Enjoyable / useful	12
Nice / Marvelous	12
Outstanding / leading idea	10
I wish that it is applied to other courses	8
Successful by all means	9
Gives an idea about the style of questions	10

Table 4: Special remarks of male and female students

Male	Female
Marvelous trial and this is what Department of Physiology got us used to: invention, enjoyment and innovation.	I was ready for the major quiz without hesitation.
Successful by all means and the proof for that is the easiness and fastness in reading the book.	Made me concentrate on the every word said in the lecture.
Made me, for the first time enjoy studying in such a difficult college like medicine.	First time I feel understood most material presented.
The best method I ever met in all lectures.	Physiology course and teachers are outstanding.
It has made me concentrate in all lectures.	We learnt from our mistakes.

In their written comments, the vast majority of both male and female students appraised the trial as excellent, marvellous, enjoyable, etc (Table 3). Special remarks made by some students (one for each remark) indicated how much the students had benefited from the trial and expressed their feelings about Physiology as a course and the department (Table 4). The major disadvantages mentioned by some students are listed in Table 5.

Table 5: Major disadvantages mentioned by male and female students

1.	Right answers not given
2.	Reduces formal lecture time
3.	No chance for make up
4.	Cheating
5.	Time not enough
6.	Hinders revision of lectures at home
7.	Unjustifiable way to evaluate students and boring because it is in every lecture
8.	Students think about quiz during lecture.

Table 6: Comparison of students performance in the four major quizzes

Quiz No.	System covered	Mean \pm SD (n=137)	Significance (paired t-test)
1.	Circulation	24.41 \pm 4.29	0.040
2.	GUT	23.96 \pm 4.36	0.001
3.	Endocrine	24.99 \pm 4.64	0.795
4.*	Renal	25.07 \pm 3.59	-

*Reference

Table 7: Comparison of students performance in the final exam in three major systems covered

System	Mean \pm SD (n=137)	Significance (paired t-test)
Endocrine	79.7 \pm 19.1	0.096
Respiration	81.8 \pm 16.0	0.938
Renal*	81.7 \pm 15.5	-

*Reference

Students performance in the major quiz (quiz No. 4) related to the system under trial (renal) was better than their performance in the first two quizzes in the course, on circulation and the Gut, which were conducted in the first semester (Table 6). However, there was no significant difference between their performance in the two quizzes on endocrine and renal systems conducted in the second semester (quizzes number 3 and 4) (Table 6). Students performance in the three systems covered in the final exam was not significantly different (Table 7).

DISCUSSION

The results of the questionnaire clearly express student satisfaction and preference for this practice. Teachers of both male and female students felt that students really enjoyed and liked this experiment. Attendance at most lectures was almost 100%, which is rare in our college. Also students were very attentive and keen to understand every part of the lecture.

Exams are known to be a strong stimulus as external motivation for learning.^{2,3} What is novel

in this study is the use of this stimulus to improve attendance and attention at lectures. However, student performance in the final exam was not affected by these end of lecture quizzes. The reason might be linked to the greater effort students make in studying for their final exams and the relative difficulty of the concepts in renal physiology compared to other systems they had to study. Most of the disadvantages mentioned by the students have been felt by the teachers also. Fortunately, these could be remedied.

CONCLUSION

The study proves that an end-of-lecture quiz on the material just covered in that lecture is a useful stimulus to external motivation provided it is done

randomly, correct answers are given at the end of the quiz and cheating is minimized.

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