

The Impact of Quizzes on Students Achievement in Accounting Examinations

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ABSTRACT

This study examines the effect of quizzes on students' achievement in accounting examinations as measured by exam scores.

Two groups of students (experimental group and control group) who were taking the cost accounting course (Administrative Science A.S. 441) during the first term (Fall) 1990/1991 were chosen for the study. The choice of this course was inevitable because it was the only course which consisted of two sections and taught by the researcher. Students who dropped or repeated the course were excluded. The experimental group (49 students) was given four quizzes during the term. These quizzes carried 15% of the total grade. The control group (22 students) was not given any quizzes. The results of the t-test indicate that students who have taken quizzes during the term did not perform significantly better than students who did not take quizzes. Possible explanations for this result are provided.

1. INTRODUCTION

There had been much theoretical discussion of the value of testing in the learning process in that it helps motivate students to spend more time in preparing for the test and as a result improves their performance on exams. However, only spasmodic research has been carried out in the area [1, pp 169 - 182].

The so-called theory of learning also suggests that a pedagogical technique with a system of feedback, such as quizzes, has a positive impact on students' performance [2, pp 265-295]. Based on this, instructors are interested in motivating the students to enhance their achievement in the course. It can be assumed that they feel that quizzes as a teaching technique could have a positive effect on students' performance.

This paper reports the results of an empirical study concerning the effect of quizzes on students' achievement in accounting examinations as measured by exam scores.

1.1 Importance of the study

This study may be considered as the first of its kind to be conducted in a Jordanian environment. In addition, the results of the study provide information which may be useful to accounting educators and students.

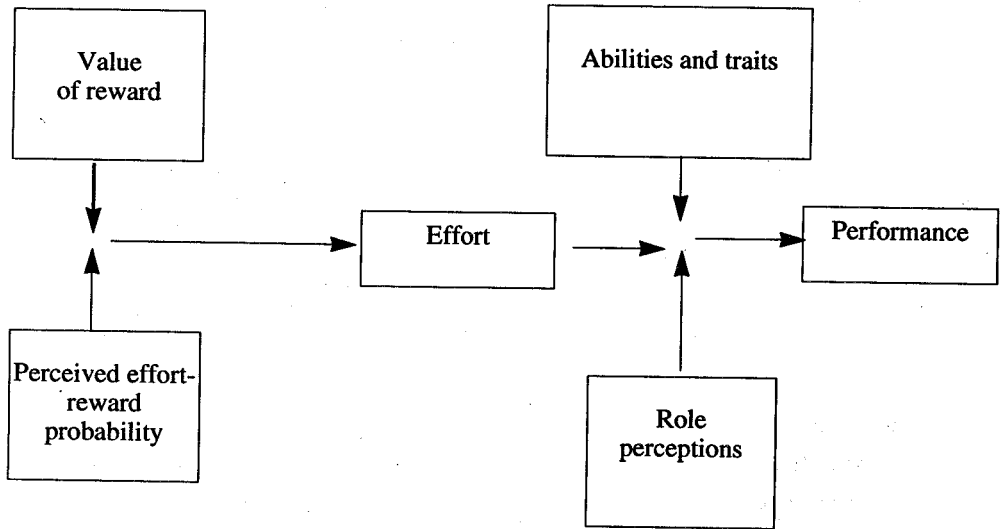
It is assumed that the results will enrich the relevant literature on the effect of quizzes on students' achievements. Moreover, knowledge of the effect of quizzes on students' achievement could provide a basis for accounting educators to reconsider and review their teaching techniques regarding quizzes, consequently improve the teaching process. Finally, the results should enable students in general to put more effort on quizzes in order to improve their performance.

1.2 The Motivational Model

The expectancy theory of motivation should be examined as a basis for increasing students' motivation to perform. The theory states that performance is dependent upon the following factors (see figure 1).

1. The amount of effort expended by an individual.
2. His or her abilities and traits.
3. Role perception regarding his or her work.

Figure 1
The Porter-Lawler Motivational Model



(Source: Porter and Lawler [1968, p 165])

In the classroom, effort expended by a student is influenced by a student's preference for a potential grade (value of reward) and his or her perception of the probability that an increased amount of effort will lead to the desired grade (perceived effort-reward probability) [3]. Thus, if a person is given a desired goal and is shown a clear path leading to that goal that student will become motivated to increase goal orientated effort.

It is assumed that an accounting instructor would be able to influence a student's effort through assigning different teaching techniques which may include quizzes. An instructor may influence a student's effort by changing his or her perceived effort-reward probability. This, in general, is likely since a student should see a higher probability that his effort being rewarded.

2. A REVIEW OF PREVIOUS RESEARCHES

The trend in related studies has been toward accepting testing as an important variable in improving students' learning and retention and focusing on questions such as the timing and number of quizzes [4, pp 312 - 317; 5,6 pp 179 - 183]. In fact, the properly conducted

related studies clearly suggest that quizzes can enhance student achievement provided if they are used properly.

Halpin and Halpin [7, pp 32 - 38] investigated the effects of a test in contrast with no test on learning. They found that students who studied for and took a test achieved significantly better results than students who studied on order to learn rather than for a test. Stout and Smeltz [8 pp 1 - 31] compared the use of quizzes to the conventional lecture-discussion teaching method and found that quizzes had a positive but mild effect on students' achievement in the exam.

Baldwin [9, pp 664 - 671] took two groups of students (experimental and control groups). He gave the experimental group quizzes before lectures and discussions and gave the control group quizzes after lectures and discussion. The results indicated that giving students quizzes before lectures and discussions resulted in more productive use of class time and improved learning.

Vruwink and Otto [10 pp 402 - 408] examined the effect of homework collection and quizzes on students' performance as measured by exam scores. Based on the expectancy theory, Vruwink and Otto argue that an accounting instructor is able to influence a student's effort through assigning different tasks such as homework collection and quizzes. However, the results indicated that quizzes and homework collection did not significantly improve exam scores.

It is apparent that previous research on the effect of quizzes on students achievements provides mixed results. An explanation of these contradictory results is provided by Elikai and Baker [11] who state that it can be related to the degree of rewards offered for taking the quizzes. In this regard, Norman [2] suggests that there must be an appropriate motivational or reward system that encourages students to do their assignments and also enable the instructor to obtain feedback concerning the degree of understanding and performance of students. Hence, quizzes can be used as a feedback system and can increase student performance if there is a substantial reward for the quizzes. There is also empirical evidence that rewards can have a significant effect on students performance. Gold et al. [12, pp 17-21] and Hales et al. [13] found substantially higher achievements in classes that gave grades. Moreover, Austin [14, pp 115 - 122] found that homework that was assigned and checked contributed more to students achievement than homework that we assigned but not checked.

Elkai and Baker [11 pp 248-254] investigated the effect of quizzes on students achievement when the students are given quizzes with substantial reward, insignificant

rewards or no rewards. The study was conducted over three semesters and in each semester two sections of students were included in the experiment. The students attended either a morning section or an afternoon section of a managerial accounting course. The class sizes in each semester were comparable; there were 56, 75 and 60 students in each of the three semesters respectively. The findings indicated that quizzes can be used to improve students performance when rewards (points) assigned to quizzes are substantial. However, when the rewards associated with the quizzes are small or not clearly defined, students do not perform significantly better than students not asking quizzes.

The main purpose of this study is to examine, in a Jordanian context ⁽¹⁾, the previous research on the notion that quizzes can improve students achievement. The expected result was better scores on accounting examinations for students who had quizzes as compared with those who did not have quizzes.

Research Hypothesis:

Building upon previous researches, this study hypothesises that students achievement as measured by exam score can be improved by influencing the students perceived effort-reward probability. An instructor accomplishes this by quizzes which are a part of a student's grade and are perceived by the student as a means of improving his or her grade in the class. The research hypothesis is:

H1: Quizzes have a significant effect on students' achievement as measured by exams' scores.

3. THE OPERATIONAL PROCEDURES OF THE STUDY

The study was conducted on two sections of students who were taking the cost accounting course (A.S. 441) during the first term (Fall) 1990/1991 (section 1 - the experimental group and Section 2 the control group). There were 14 accounting courses offered by the Department of Accountancy/Yarmouk University during that term. The choice of the two cost accounting sections was made because the researcher was teaching this course and it was the only course (of the researchers' load) which consisted of two sections. The experimental group consisted of (49) students, whereas the control group consisted of (22) students.

All students in both sections were given a course outline on the first class day explaining in detail the course to be covered, ⁽²⁾ the recommended textbook ⁽³⁾ and the allocation of marks. Besides, students in the experimental group were informed that there

will be four quizzes during the term, such quizzes carry 15% of the total grade.

The timing of the class could affect students achievement. That is, students attention and ability to learn may differ according to class time. The time of the experimental group was from 12 - 1 and the control group from 2 - 3 so time differences were considered of little significance on students achievement.

Both classes were taught by the same instructor. Each class met three times a week for the same amount of time (50 minutes) and received the same lecture notes. Also students used the same text and were given the same homework assignments. Students in both groups were given three required exams: first; second and final during the term ⁽⁴⁾. For both groups the exams were held at the same time. In addition, the same questions were given for both groups to maintain a state of fair and equal difficulty. Exam questions focused on the same material.

The only difference thought of as to be under control and test between the two groups was in the treatment of quizzes. The experimental group was given four quizzes each carry 10 points (15 percent of the total grade). These 40 points were considered as equal to 15 marks then students score in all quizzes was computed as part of the 15 marks. Quizzes were administered regularly (one quiz every month over a four-month term). All quizzes were given during class time in the classroom.

The quizzes were announced to students one week before the date of the quiz. Students were told about the points allocated to quizzes. Each quiz consisted of a computational question related to the material covered in each chapter. The time allowed for each quiz ranged between 20 - 30 minutes.

Students who dropped the course during the drop period ⁽⁵⁾ were excluded. Also students who repeated the course were excluded. It was expected that if a student repeated the course several times there would be a relatively steady improvement in his/her performance as a result of further study and experience. Therefore, selecting students taking the course for the first time made it possible to examine the effect of quizzes on students exam scores without the effect of a pre-test on performance. The results of each quiz were returned to the students as soon as possible and critical points were discussed with them so that each quiz provides appropriate feedback to both the instructor and the students. This would affect, somehow, the achievement of the quiz group. As a result, quizzes and feedback on the results could be used a motivational technique. There were no partial credit given, nor any curving system used in the quizzes.

Some of the students who participated in the study were not majoring in accounting ⁽⁶⁾. Table 1 shows the distribution of students according to their major in each group.

Table 1
Distribution of students according to major in each group

	Treatment		
	Quizzes	No Quizzes	Total
Accounting majors	32	19	51
Nonaccounting majors	17	3	20
Totals	49	22	71

As the two groups of students were independent of each other and of different sizes and students marks were considered to be measured at the interval scale the t-test was used. The t-test was employed to test the null hypothesis that the two groups were drawn from identical population (i.e. population with the same mean) versus the alternative hypothesis that the two samples were drawn from different populations [15, 16].

Finally, a conventional level of significance of .05 was used in testing the validity of results.

4. THE MAIN FINDINGS OF THE STUDY

The distribution of the final grades for both sections appears on table 2. The table shows that a higher percentage of students in section 1 scored slightly higher grades than students in section 2. This indicates that quizzes can be used as feedback to students and encourage them to study harder.

Table 2
Grade distribution of students in both groups*

	Experimental Group		Control Group		Total	
	No	%	No	%	No	%
Excellent	3	6.1	0	0	3	4.2
Very Good	3	6.1	2	9.1	5	7.1
Good	8	16.3	2	9.1	10	14.1
Pass	17	34.8	8	36.4	25	35.2
Weak	18	36.7	10	45.4	28	39.4
Totals	49	100.0	22	100.0	71	100.0

* The above grades are based on the following scale: 86-100% = Excellent, 76-85% = very good, 67-75% = Pass and below 50% = fail.

To control the effect of students' abilities and traits (e.g. intelligence, aptitude for course material) on exam scores, the t-test was used. Cumulative average of students prior to the term of the study (i.e. at the end of the summer term 1989/1990) was selected as an indicator for measuring the ability of students in each group. This was the only reliable and available indicator at the Department of Admission and Registration. Students cumulative average ranged between 57.4 and 91.2. In this regard, Baldwin [9] found cumulative average to be a very good predictor of future test scores. Moreover, Dockweiler and Willis [17, pp 496 - 504] examined the relationship between some independent variables and students performance in the university. They found that grade point average is the single best predictor of future academic performance. Thus, students who did well on exams in previous classes usually continue to do well in their current classes.

The t-test was used to test the null hypothesis that the cumulative average is equal between the two groups of students. The results of the t-test are presented on Table 3. The mean cumulative average of the experimental group was slightly higher (73.58) than that of the control group (71.72). The table provides support to the null hypothesis that there were no significant differences among the cumulative average of both groups.

It was perceived that accounting majors would score higher grades than nonaccounting majors. Contrary to expectations, the mean score for nonaccounting majors was higher (62) than that for accounting majors (54). This could be because the nonaccounting majors are minoring in accounting and they put more effort on accounting courses in order to score high marks and increase their cumulative average. However, as Table 3 shows there were no significant difference between the performance of accounting and nonaccounting majors at the .05 level of significance.

Hypothesis Test

The t-test was also used to test the effect of quizzes on students' performance in accounting examinations. The null hypothesis tested was:

Ho: Quizzes do not have a positive impact on students' achievement as measured by exam scores.

Table 3 reports the results of the test. The table shows that the F-values did not meet the .05 significance level and the null hypothesis that there is no significant difference between the achievement of students on terms of exam scores and quizzes cannot be rejected. That

is, quizzes were not found to have positive and significant effect on students' achievement in accounting examinations as measured by exam scores. In other words there is no significant difference in the performance of the two groups of students because of quizzes ⁽⁷⁾.

Table 3
Results of the t-test between the two groups

n1 = The experimental group

n2 = The control group

n3 = Accounting majors

n4 = Nonaccounting majors

Variable	No of students	Mean Mark	F Value	2-Tailed P
Cum. Average	n1 = 49	73.58	1.12	.36
	n2 = 22	71.72		
Major	n3 = 54	53.98	1.28	.07
	n4 = 17	62.00		
Exam score	n1 = 49	56.92	1.28	.43
	n2 = 22	53.44		

The expected result was that quizzes have a positive effect on students achievement. Probably students at Yarmouk University do not take quizzes seriously. This might be because they believe the reward is not substantial. They know that quizzes are rarely used and if used the maximum mark allocated to them is 5% only of the total grade and this is very minimal. Therefore, they did not exert much effort on quizzes although they were told at the beginning of the term that quizzes will have 15% of the total grade. Moreover, rewards for taking quizzes were not clearly defined to some students.

In addition, the timing of some quizzes seemed inconvenient to students. Although quizzes were announce one week before, there could have been some other regular exams and students have to study for the other exam at the expense of quizzes which they believe of less importance than the regular exams.

5. CONCLUDING REMARKS

The purpose of this study was to examine the impact of quizzes on students' achievement in accounting examinations. The results provide evidence that quizzes have no significant effect on students' achievement as measured by exam scores. This indicates that accounting students at Yarmouk university do not perceive a benefit from quizzes and are not motivated to work hard in order to achieve higher exam scores.

As mentioned in the results section, the reward of quizzes may be viewed by students, as not substantial. In other words, students may have perceived that the reward associated with quizzes has not been substantial enough to motivate them to work hard and increase their effort to score high grades in quizzes and the overall course grade.

The results of the study should be treated with care because of the following limitations.

First, the results cannot be generalised because there might be a sampling bias in that we took only the two cost accounting sections. That is, students were not randomly selected from their respective population.

Second, the study was conducted on the cost accounting course in one term only (Fall 1990/1991). Results could differ if two or more terms were selected and the test repeated on different groups of students.

Third, the experiment was conducted only for the cost accounting course and the findings may apply only to courses with similar content and setting.

Finally, the effect of class size has not been considered in this study. The number of students in the experimental group (49) was twice that in the control group (22). It is possible that class size has an effect on students' achievement.

For further research it is suggested that students' perceptions regarding the most appropriate motivational teaching technique in accounting could be examined. In addition, the effect of prerequisites on students' performance in a particular accounting course could also be examined in that the performance of students in any of the accounting courses may differ depending on whether or not the prerequisite courses were taken by the students. Further research could also address some related issues such as, how many marks should be allotted to quizzes to make them effective motivators to the students of the course?, and what is the optimal number of quizzes for students of this course?

Footnotes

1. The regulations concerning exams at Yarmouk University/Jordan specify that students should take three exams, first, second and final. Each of the first and second exams carries 25% of the total grade. The final exam carries 40%. The remaining 10% is allocated to participation, homework assignment and unannounced quizzes. Sometimes accounting instructors give students an unannounced quiz. The purpose here is that students should always be prepared for the course and expend more effort in order to score high grades and improve the learning process.
2. The aim of this course is to familiarise students with the basic cost concepts and terminology. It also aims to provide students with a background on the systems of cost accounting. The main topics covered in this course are:
 - Introduction to Cost Accounting: its nature and usefulness.
 - Basic Cost concepts and cost behaviour.
 - Accounting for cost flows: cost accumulation.
 - Materials and labour: costing and control.
 - Factory overhead: costing and control.
 - Allocating service departments costs.
 - Job order costing.
 - Process costing: basic procedures.
 - Costing joint and by-products.
 - Cost volume-profit analysis.
3. The textbook used is:
Horngrén, C and G Foster, *Cost Accounting: A Managerial Emphasis*, Sixth edition, Prentice-Hall, New York, 1989
4. A term is 16 weeks.
5. The add/drop period is one week (the first week in each term). a student cannot add any course after that period. However he can drop the course within the first seven weeks of each term.
6. The cost accounting course is required for all accounting majors. It is also required for students who are minoring accounting.
7. The same result was obtained using the t-test. Such supportive result is not reported here.

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