A STUDY OF ONLINE HOMEWORK MANAGERS ON STUDENT LEARNING AND SATISFACTION IN ACCOUNTING COURSES*

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ABSTRACT

Online homework managers allow instructor to assign and collect homework online; the systems then grade the homework and enter the grades into the instructor's grade book automatically. This paper addresses the question whether the use of OHMs in accounting courses affects student learning and satisfaction. The regression results provide some evidence that students doing online homework regularly scored significantly higher on final exams. In addition, with the adaptation of the OHMs, students were found to be more satisfied with the course. These findings show that the use of OHMs can help students learn accounting concepts better. Our results are likely to be of interest to many accounting faculty members who continue to use traditional teaching methods.

Keywords: Online homework managers, accounting education, accounting

JEL Classification: M41

ÇEVRİMİÇİ ÖDEV YAZILIMLARININ MUHASEBE DERSLERİNDEKİ ÖĞRENME VE ÖĞRENCİ TATMİNİNE İLİŞKİN BİR ARAŞTIRMA

ÖZ

Çevrimiçi ödev yazılımları (ÇÖY) öğretim üyesinin ödevleri çevrimiçi olarak vermesini ve toplamasını sağlamaktadır. Toplanan ödevler yazılım tarafından değerlenmekte ve öğretim üyesinin not defterine otomatik olarak işlenmektedir. Bu çalışmada ÇÖY kullanımının muhasebe derslerindeki öğrenci performansı ve tatmini üzerine olan etkisi analiz edilmiştir. Regresyon sonuçlarına göre ödevini düzenli yapan öğrencilerin final sınavından daha yüksek notlar aldığına ilişkin bazı kanıtlara ulaşılmıştır. Buna ek olarak, ÇÖY kullanımı ile öğrencilerin

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dersten daha fazla tatmin oldukları sonucuna ulaşılmıştır. Elde edilen bulgular ÇÖY kullanımının muhasebe kavramlarının öğrenilmesine yardımcı olduğunu göstermektedir. Sonuçların geleneksel öğretme yöntemlerini kullanan muhasebe öğretim üyeleri için ilgi çekici olduğu düşünülmektedir.

Anahtar Kelimeler: Çevrimiçi ödev yazılımları, muhasebe eğitimi, muhasebe

JEL Sınıflandırması: M41

1. INTRODUCTION

Online homework managers (OHMs) has been used by university students to complete and submit their homework assigned by their professors. OHMs are often provided by textbook publishers and accompanies course textbooks. OHMs are an online homework, practice, and assessment resource that enables students to master concepts and develop critical skills. Although the use of online homework software is an important issue, its impact on student performance is unknown. Since the use of online homework software in accounting courses is relatively new, there are few studies examining the impact of these software on student performance. In this study we test the impact of using OHMs on student learning and satisfaction in accounting courses. The research questions explored in this study are: (1) Whether students who use OHMs actively achieve higher scores in final exams than students who do not use it actively? (2) Whether students who use OHMs satisfied with the course compared to traditional instructional methods?

It is believed that out of class practice and immediate feedback are necessary for learning and OHMs provide this environment (Pascarella 2004). OHMs offers an additional way to review concepts introduced in the classroom. With the OHMs, weekly homework is given to the students and their feedback is provided instantly. Thus, students are expected to become accustomed to work disciplined, to increase their interest in assignments and to increase their level of learning as a result. In addition, according to modern pedagogical thinking, today's students see learning and working using technology more enjoyable and useful (Philips and Johnson 2011).

The OHMs give the students several rights on the initiative of the educator to correct the wrong assignments before they are sent to the system. It is considered possible to increase the learning realized while doing homework thanks to the right to instant feedback and correction (Bangert-Drowns v.d. 1991). In another study, it was concluded that instant feedback was more effective than delayed reporting in quizzes and classroom exercises in the classroom (Kulik and Kulik 1988, 89). It was also revealed that students who were not given feedback were less satisfied with the course and were more nervous when doing their homework (Lindquist and Olsen 2007, 103). Another benefit of OHMs is that they contribute to better learning of the subject. Some studies found evidence that students who use OHMs understand the lessons better and reinforces what they have learned (Cheng, et al. 2004; Smolira and Joseph 2008; Burch and Kuo 2010; Arora et al. 2013). OHMs presents assignments in order and showing the deadline. Thus, it is expected that students will become accustomed to work disciplined, their interest in homework will increase and as a result the learning level will increase (Gaffney et al. 2010). Another study argues that the use of computer-based learning tools in accounting courses has the potential to attract students to the learning process more effectively than the traditional approach that the instructor unilaterally lectures (McDowall and Jackling 2006). In some studies, the positive effect of OHMs on student performance was observed. It has been observed that computer-aided education increases students' success and increases their computer use competences in addition to

learning accounting concepts better (Lusher, et al. 2012, 10).

The remainder of this paper is organized as follows. In the following section, we describe the methodology and research model. Next, the results of the data analysis are reported. Final section presents the discussion of results and the implications of the study.

2. METHODOLOGY

This study describes the use of an OHMs in four different accounting classes taught at Istanbul University and Ozyegin University. In total, 288 students agreed to participate in the study. We use data from student surveys (given at the beginning and end of the course), instructor surveys, course syllabi, course records, and the OHM platform to describe how OHM was used in each of the classes, along with how use of OHM is associated with achievement. We used a survey instrument that was based on validated measures from previously conducted studies by Pearson. A link to the questionnaire on SurveyMonkey.com was emailed to students, and they were asked to complete the pre survey at the beginning and post-survey at the end of the semester.

The four classes cover different topics in accounting: cost accounting, managerial accounting, auditing, and financial accounting. As may be expected, the classes use different OHM titles and have different homework assignments and exams. For this reason, we will tend to summarize findings for the classes separately as well as aggregating over the four classes.

Final exam scores are an indicator of student learning within the course. The strength of relationship between exam scores and aspects of OHM usage may be characterized by their correlations. Correlations provide a weak standard of evidence, unfortunately. It would be preferable to use a regression model for final exam score that controls for prior achievement or a pretest. Eskew and Faley (1988) examined determinants of accounting students' performance and found past academic performance to be the best indicator of future performance in that previous grades predict later grades. Because a measure of prior achievement is not available, we will appropriate the midterm score for this purpose. The model we propose is a regression of final exam score on the change in homework score after the midterm, controlling for midterm score:

$$[\text{final}]_i = \beta_0 + \beta_1 [\text{midterm}]_i + \beta_2 [\text{homework change}]_i + \epsilon_i$$

3. RESULTS

In total, 288 students in four classes agreed to participate in this study. Of those students, 244 submitted the pre-survey and 148 submitted the post-survey. In this report section, all students are grouped together to provide an overall picture regarding their responses to the survey questions.

Responses to the pre-survey for all students are summarized in Figure 1. Most students were between 18 and 21 years of age, and they were evenly mixed regarding gender. About half of the students began learning to read English at age nine or younger, while about half began later.

Figure 2 summarizes responses to questions about how they accessed OHM, which were a part of the

post-survey. Most students were able to access OHM within the first week of classes, but less than half

were able to purchase the required textbook in the first week. Almost all students accessed OHM using a desktop or laptop computer. Smaller numbers also used either a tablet or smartphone as well. Only 1% of students said they did not use OHM at all.

Figure 3 summarizes student ratings in response to several questions about OHM, which was also a part of the post-survey. Students generally rated OHM favorably on several opinion questions. Large majorities of students agreed that OHM enabled them to come to class better prepared, be more engaged in learning, use different strategies to learn, access a variety of learning materials, and take more ownership of their learning. Ratings were lower for two questions about spending more time on helpful assignments and about receiving personalized feedback.

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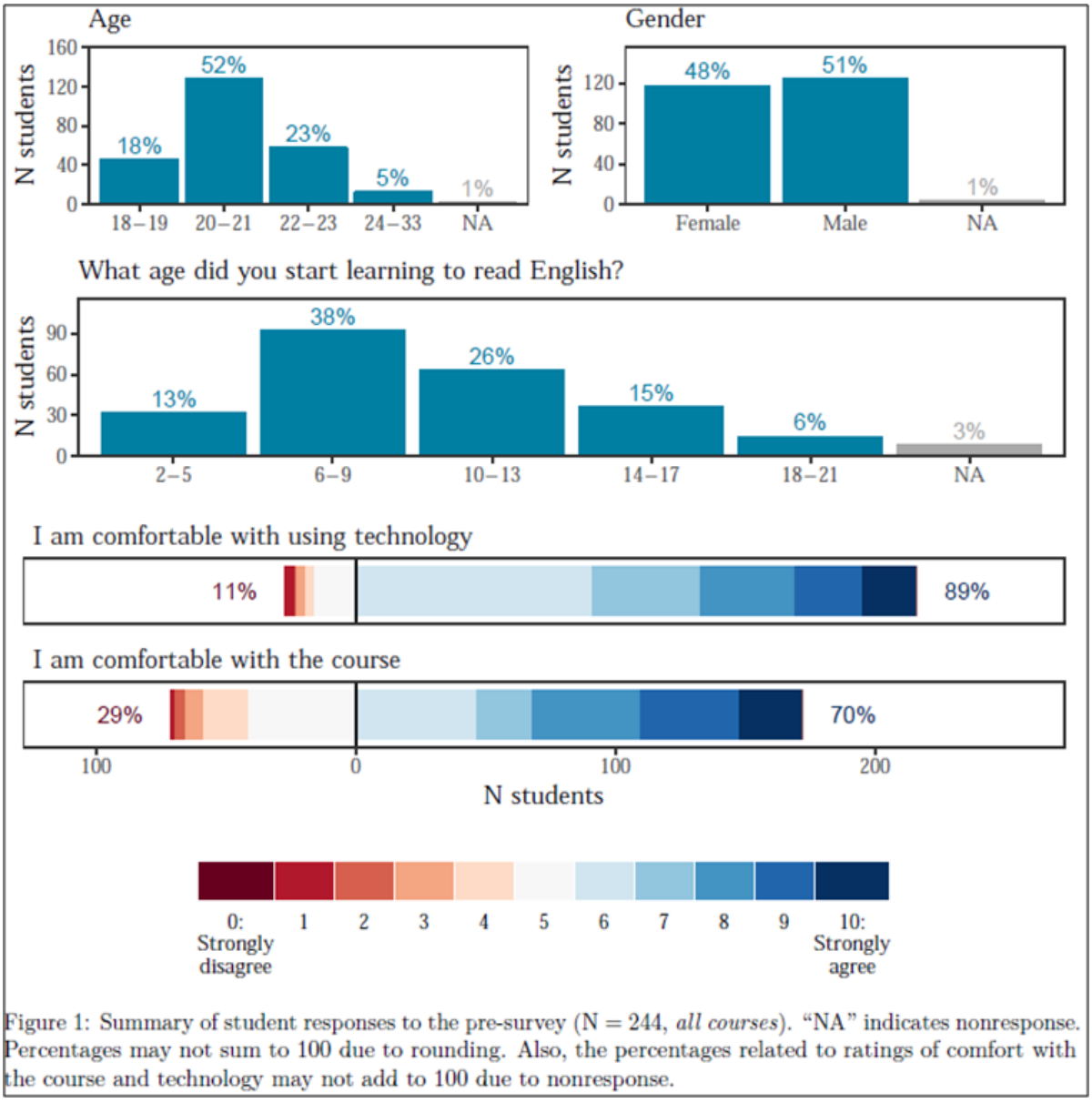

Figure 1: Summary of student responses to the pre-survey (N = 244, *all courses*). "NA" indicates nonresponse. Percentages may not sum to 100 due to rounding. Also, the percentages related to ratings of comfort with the course and technology may not add to 100 due to nonresponse.

Figure 1. Summary of Student Responses to the Pre-survey

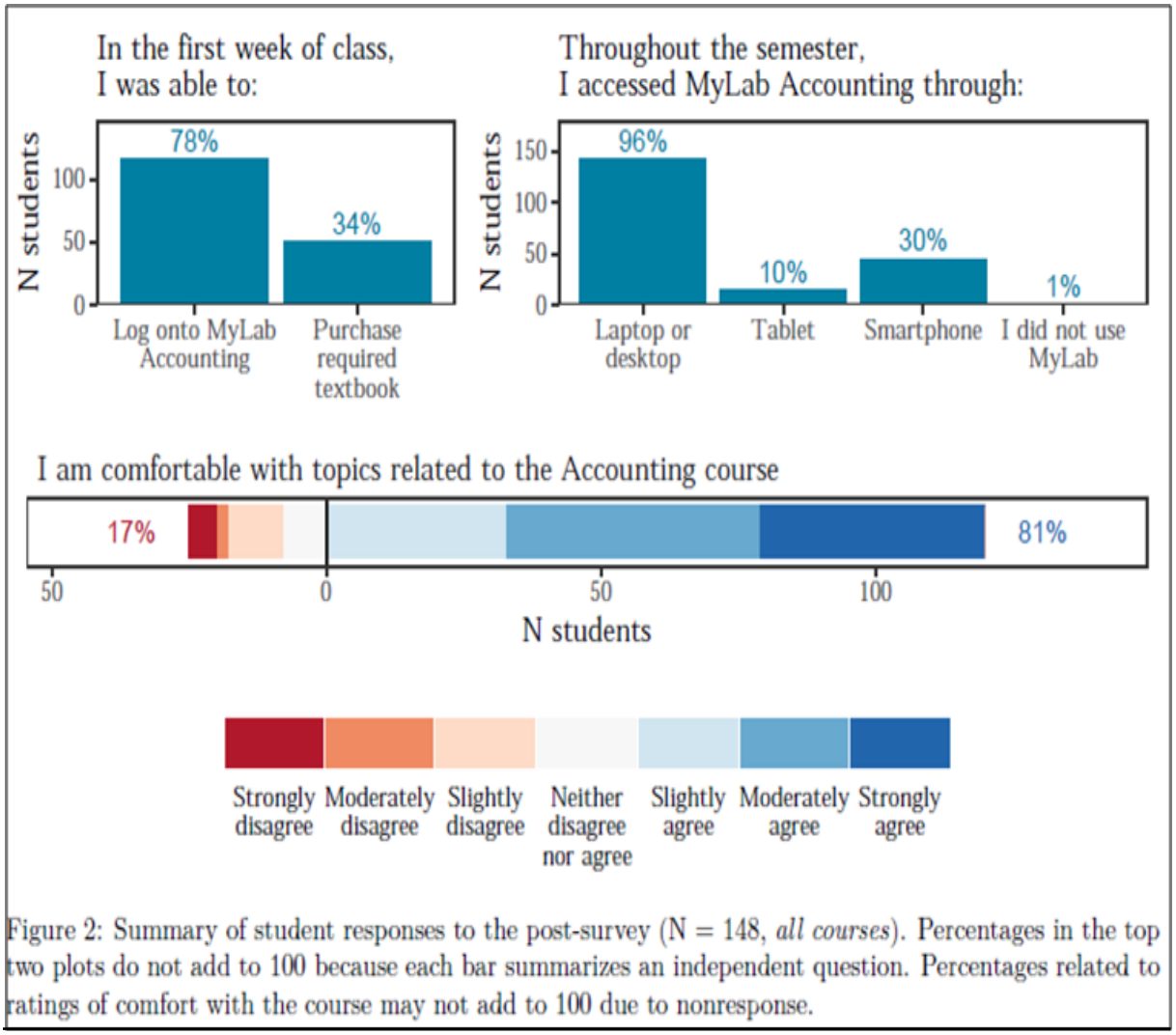

Figure 2: Summary of student responses to the post-survey (N = 148, *all courses*). Percentages in the top two plots do not add to 100 because each bar summarizes an independent question. Percentages related to ratings of comfort with the course may not add to 100 due to nonresponse.

Figure 2. Summary of Student Responses to the Post-survey

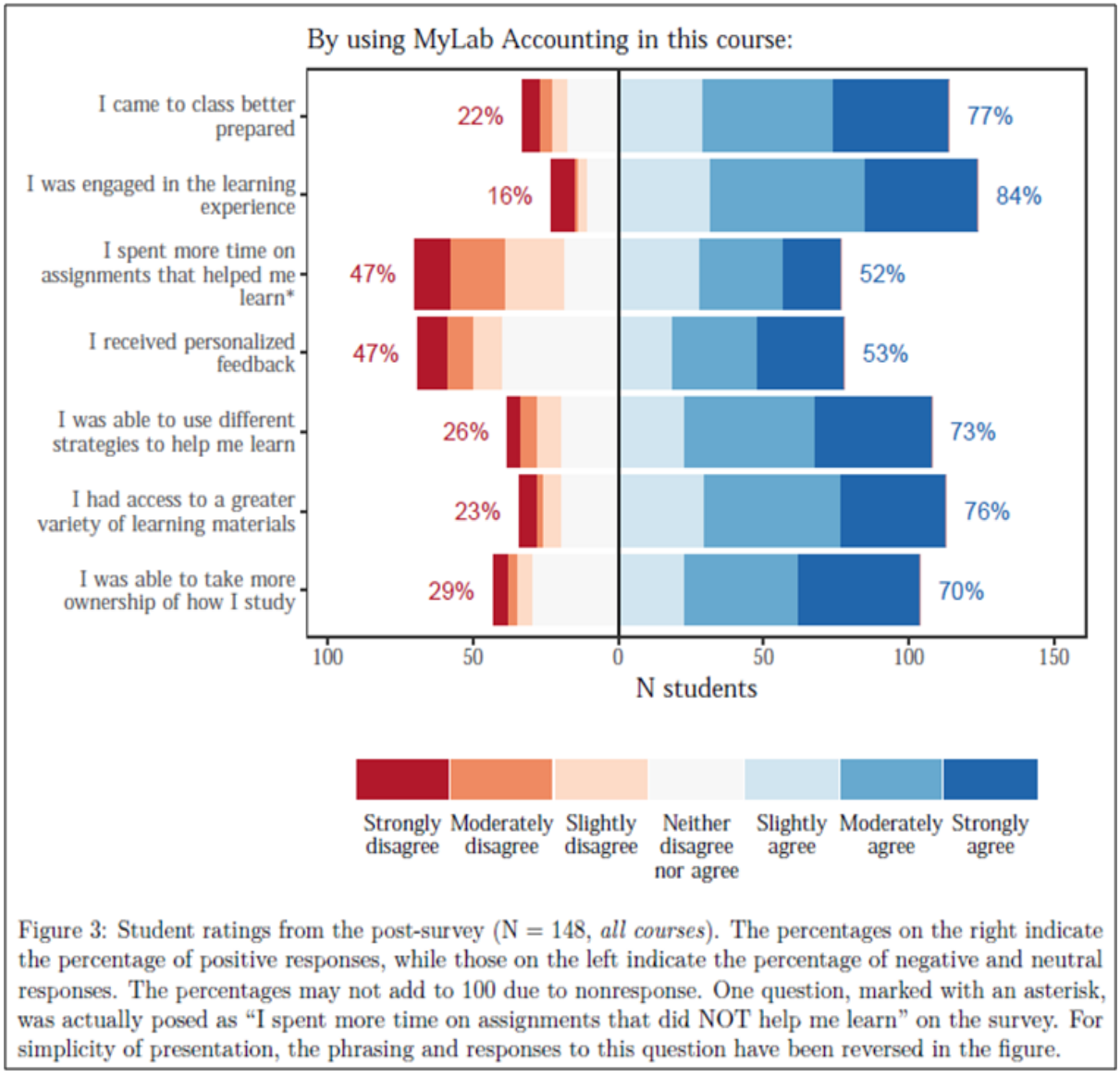

Figure 3: Student ratings from the post-survey (N = 148, *all courses*). The percentages on the right indicate the percentage of positive responses, while those on the left indicate the percentage of negative and neutral responses. The percentages may not add to 100 due to nonresponse. One question, marked with an asterisk, was actually posed as "I spent more time on assignments that did NOT help me learn" on the survey. For simplicity of presentation, the phrasing and responses to this question have been reversed in the figure.

Figure 3. Student Ratings from the Post-Survey

Financial accounting class had 128 students, of which 100 participated in the study. Class sessions were a mixture of lecture and discussion with student participation, sometimes including example cases. Homework assignments were worth 20% of students' course grades, the final constituted 35%, the midterm 35%, and unannounced quizzes 10%. All four of these, not just homework, were administered in OHM. The professor assigned 10 homework assignments in OHM. On average, students submitted 72% of the OHM assignments, and they typically spent about 99 minutes on any given assignment.

Final exam scores are an indicator of student learning within the course. We found a correlation of 0.23 between homework scores and final exam scores, indicating that students who do well on the homework tend to do well on the final. Correlations provide a weak standard of evidence, unfortunately. It would be preferable to use a regression model for final exam score that controls for prior achievement

or a pretest. Because a measure of prior achievement is not available, we will appropriate the midterm score for this purpose. The model we propose is a regression of final exam score on the change in homework score after the midterm, controlling for midterm score:

$$[\text{final}]_i = \beta_0 + \beta_1[\text{midterm}]_i + \beta_2[\text{homework change}]_i + \epsilon_i$$

This is an attempt to estimate the relationship between students' online homework performance in the second half of the course for their online homework performance and midterm score in the first half. For easier interpretation, the two covariates are mean-centered and divided by ten. Results from this model are presented in Table 1. Based on the model, students whose homework scores increase by ten percentage points after the midterm are expected to obtain final exam scores that are 1.62 (95% credible interval: 0.33, 2.91) percentage points higher than students whose homework score remains the same, holding constant their midterm scores. The same regression model will be fit for the other classes, with results being reported in subsequent sections. Figure 4 provides a summary of the regression coefficients for all the classes.

Table 1. Summary of the Linear Regression for Financial Accounting

	Estimate	Lower Bound	Upper bound
Coefficients			
Intercept	35.89	33.17	38.63
Midterm score (per 10 percentage points)	4.60	3.09	6.15
Change in homework score (per 10 percentage points)	1.62	0.33	2.91
Fit summary			
Residual standard deviation	13.53	11.75	15.66
Bayesian R-square	0.31	0.17	0.42

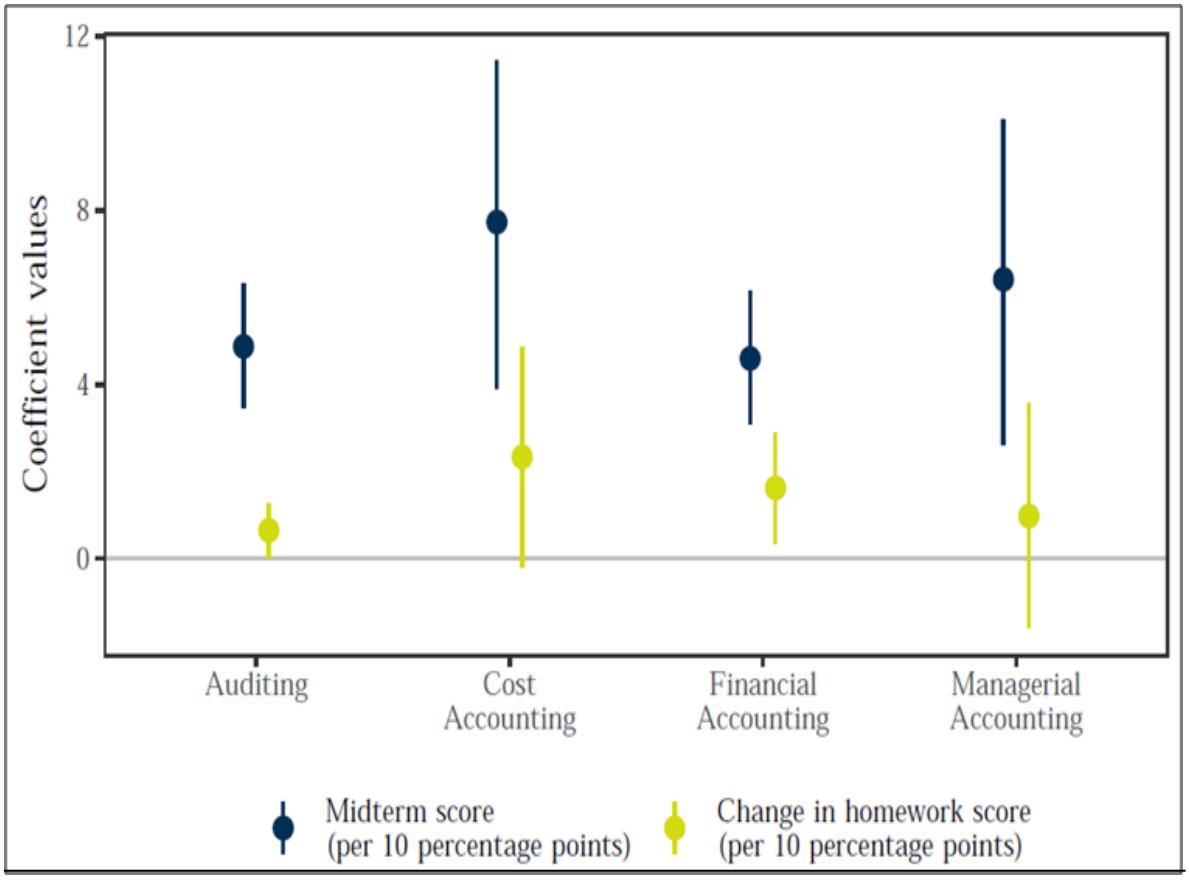

Figure 4. Summary of Coefficients for the Four Regression Models

Auditing class had 154 students, of which 96 participated in the study. The professor assigned 10 homework assignments in OHM. On average, students submitted 69% of the OHM assignments, and they typically spent about 25 minutes on any given assignment. Work on OHM homework was worth 20% of students' course grades. The same analytic methods described in financial accounting are applied to this class as well. We found a correlation of 0.48 between homework scores and final exam scores, indicating that students who do well on the homework tend to do well on the final. Results from this model are presented in Table 2. Based on the model, students whose homework score increases by ten percentage points after the midterm are expected to obtain final exam scores that are 0.65 (95% interval: 0.01, 1.27) percentage points higher than students whose homework score remains the same, holding constant their midterm scores.

Table 2. Summary of the Linear Regression for Auditing

	Estimate	Lower Bound	Upper bound
Coefficients			
Intercept	56.61	54.62	58.58
Midterm score (per 10 percentage points)	4.88	3.46	6.32
Change in homework score (per 10 percentage points)	0.65	0.01	1.27
Fit summary			
Residual standard deviation	9.97	8.63	11.55
Bayesian R-square	0.35	0.21	0.46

Managerial accounting class had 95 students, of which 50 participated in the study. The professor assigned 9 homework assignments in OHM. On average, students submitted 85% of the OHM assignments, and they typically spent about 114 minutes on any given assignment. Work on OHM homework was worth 30% of students' course grades. The same analytic methods described in financial accounting are applied to this class as well. We found a correlation of 0.35 between homework scores and final exam scores, indicating that students who do well on the homework tend to do well on the final. Results from this model are presented in Table 3. Based on the model, students whose homework

Table 3. Summary of the Linear Regression for Managerial Accounting

	Estimate	Lower Bound	Upper bound
Coefficients			
Intercept	63.05	58.61	67.53
Midterm score (per 10 percentage points)	6.42	2.63	10.08
Change in homework score (per 10 percentage points)	0.98	-1.60	3.58
Fit summary			
Residual standard deviation	15.38	12.49	19.26
Bayesian R-square	0.35	0.15	0.51

score increases by ten percentage points after the midterm are expected to obtain final exam scores that are 0.98 (95% interval: -1.60, 3.58) percentage points higher than students whose homework score remains the same, holding constant their midterm scores. There is a substantial amount of uncertainty regarding this relationship, such that we cannot be confident in the direction.

Cost accounting class had 98 students, of which 42 participated in the study. The professor assigned 8 homework assignments in OHM. On average, students submitted 45% of the OHM assignments, and they typically spent about 90 minutes on any given assignment. Work on OHM homework was worth 20% of students' course grades. The same analytic methods described in financial accounting are applied to this class as well. We found a correlation of 0.47 between homework scores and final exam scores, indicating that students who do well on the homework tend to do well on the final. Results from regression model are presented in Table 4. Based on the model, students whose homework score increases by ten percentage points after the midterm are expected to obtain final exam scores that are

2.34 (95% interval: -0.20, 4.86) percentage points higher than students whose homework score remains the same, holding constant their midterm scores. There is a substantial amount of uncertainty regarding this relationship, such that we cannot be confident in the direction.

Table 4. Summary of the Linear Regression for Cost Accounting

	Estimate	Lower Bound	Upper bound
Coefficients			
Intercept	46.42	38.30	54.27
Midterm score (per 10 percentage points)	7.73	3.92	11.43
Change in homework score (per 10 percentage points)	2.34	-0.20	4.86
Fit summary			
Residual standard deviation	26.01	20.75	32.70
Bayesian R-square	0.37	0.17	0.52

4. CONCLUSION

Nowadays, academicians are expected to provide quality education as well as qualified research. In the light of constantly changing academic promotion criteria, faculty members need to work more effectively. One of the points where the faculty member can save time is to collect and evaluate the assignments in electronic environment. Using OHMs, the faculty member will transfer his / her time to research activities or teaching activities with higher contribution value.

In this study, the effect of OHMs on student performance and satisfaction were investigated. We found some evidence based on a regression model that controlled for midterm exam achievement, students who improved their homework scores after the midterm tended to perform better on the final exam in accounting courses. As a result of the analysis, we can argue that the students who use the online homework system effectively have better learning compared to students who do not do their homework regularly. In addition, we found that large majorities of students agreed that using OHM enabled them to come to class better prepared, be more engaged in learning, use different strategies to learn, access a variety of learning materials, and take more ownership of their learning.

As in all research, this study has some limitations. The data analyzed within the scope of this research was obtained from only two university students. It is possible that the students from other universities would not answer the same way. Due to the inability to obtain a variable such as the university entrance exam score or the grade point average reflecting the past performance of the students, the learning process could be assessed only in a seven-week window between the midterm and final exams. If this constraint is eliminated, the impact of OHMs on learning can be examined over an entire semester. We believe that the results are interesting for faculty members who use traditional homework methods but intend to use online homework systems. Future studies may investigate the effect of clickers and in-class online quizzes on student performance in accounting courses.

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