

THE EFFECT OF VOLUNTARY USE OF AN ONLINE HOMEWORK MANAGEMENT SYSTEM ON COURSE GRADES IN FINANCIAL ACCOUNTING

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ABSTRACT

In previous studies of online homework systems in accounting courses, their use was mandatory for all participants. This paper presents the results of a small study in which financial accounting students had the option of completing homework by using an online homework manager (MyAccountingLab) or by using a traditional pencil-and-paper approach. The research project was conducted at a women's college in the southeastern United States, and all participants were female. Controlling for GPA, major, and hours of study, those students who chose to use an online homework system were significantly more likely to have a lower course grade than those who did not.

JEL: M400, M490

KEYWORDS: Online Homework, Grades, Financial Accounting

INTRODUCTION

A recent survey found that 85 percent of college students now own a laptop and 81 percent cannot imagine doing schoolwork without their technology ("Laptops Move," 2014). One result of the widespread use of laptops is the increasing numbers of colleges adopting online homework management systems. Their use in accounting courses reflects a desire of faculty to offer students a way to get help on demand or to develop mastery by completing additional algorithmic problems. Online homework systems provide immediate feedback on homework, extra practice problems, help or explanations on complex material, and usually include video tutorials or guided problem solving. They tend to offer more problem-solving support than traditional homework through partially set-up templates where students choose from an array of possible choices. For those students who have different learning styles, these systems can help them achieve success that might not be possible with traditional approaches. Numerous studies have examined the effectiveness of online homework systems in accounting. The students in these studies were required to buy a computer-based homework system.

Because the additional cost of an online homework system might discourage enrollment for some cash-strapped students, we offered financial accounting students the option of buying MyAccountingLab or using traditional methods to complete homework assignments. Our research examined whether there was a significant difference in student performance as measured by final course grade between students who used an online homework management system and those students who did not. Final course grades were collected along with GPA, study hours per week, visits to the tutoring center, previous experience with computer-assisted homework, and major. Participants also completed a survey about their perceptions of the homework system, motivation to buy (or not buy), and changes in study habits. Regression results showed that those students who chose to use an online homework system were significantly more likely to have a lower course grade than those who completed their homework without the online homework system. The findings of this study contribute to the accounting education literature

by suggesting that students who use an online homework system may view it as shortcut to completing homework to the detriment of their subject mastery. The remainder of this paper is organized as follows: Section 2 reviews previous studies on the use and effectiveness of online homework systems in accounting. Section 3 describes the data collected and the methodology followed. The results and discussion are presented in Section 4. In Section 5, we present our main conclusions and offer suggestions for future research.

SELECTED LITERATURE REVIEW AND RESEARCH QUESTIONS

Many researchers have examined the effectiveness of online homework systems finding mixed results. In most of the prior studies, the use of computer-based learning was mandatory. In a study of financial accounting students, Collins, Deck, and McCrickard (2008) reported that accounting students who used computer-aided instruction for homework had significantly higher final exam scores than students who did their homework on paper. When GPA was added as a control variable, Dillard-Eggers, et al. (2008) found a similar result. They also considered other variables that might influence the effectiveness of online homework such as time spent studying and technical problems with the computer program. When comparing online homework to traditional format, most students (44%) reported spending about the same amount of time studying with 39% spending more time and only 16% spending less time. Few (5%) reported experiencing any technical difficulties using the online homework manager. Most students said the online homework resulted in higher quality study time (53%) and a higher understanding (55%) of the topics compared with alternate study methods. However, when asked to compare online homework with “pencil and paper” homework on its effect on learning, a sizable minority (31%) viewed online learning negatively. There was a more ambiguous result in a study by Gaffney, Ryan, and Wurst (2010). They found that financial accounting students who used an online homework management system performed significantly better than students who used a traditional homework method on comprehensive problems. However, there was no difference in their performance on predominately multiple-choice exams. Hahn, Fairchild and Dowis (2013) also found no significant difference in performance between students using an online homework management system and a pencil-and-paper control group. Multiple-choice questions were used to measure performance.

Fatemi, Marquis, and Wasan (2014) examined the use of online homework systems by intermediate accounting students. They found that those who used an online homework system performed significantly better on test problems but significantly worse on multiple choice questions compared with students who did traditional homework. The multiple-choice questions were designed to test a student’s conceptual understanding of the material. The authors concluded that manual homework “forces students to consult the textbook more often, engage in critical thinking to a higher degree, and determine the overriding conceptual issues for themselves.” (Fatemi, et al., 2014, p. 8) Several student traits may influence the effectiveness of online homework management systems. Khanlarian and Singh (2014) theorized that students who experience frustration in their use of technology might not benefit from computer-based learning. If students experience difficulty installing or navigating the online homework system, its effectiveness may be negatively impacted. Some students are less engaged in the course and not motivated to learn. Peng (2009) identified the role of cognitive need in the effectiveness of online homework managers. He found that “students who are less motivated to do homework are significantly more likely to use the instant feedback from the system so they can lessen their cognitive burden when working on homework” (Peng, 2009, p. 264). If less motivated students rely on online homework systems to take shortcuts with homework, their effectiveness will be impaired. In previous studies of the effectiveness of online homework managers, the use of technology was mandatory. Agarwal and Prasad (1997) examined the role of perceived voluntariness in technology acceptance. They found that when the use of technology is mandatory, especially in the early stages of the experience with the technology, initial usage increases. Over time, though, the individual’s acceptance of the technology may weaken.

DATA AND METHODOLOGY

Many students view ancillary costs associated with college classes as major expenditures. The price of college textbooks has increased dramatically over the last decade and students struggle to pay for both textbooks and other required materials. Students in this study purchased both a textbook and a one-semester subscription to the *Wall Street Journal*. To lower the financial barrier for course entry, the instructors in this study gave students in Financial Accounting the option of buying MyAccountingLab for an added \$55 license fee. There was no difference in homework assignments or tests given to both groups. The purpose of this exploratory study was to examine the influence of “perceived voluntariness” on the effectiveness of online homework systems. We investigated whether there is a significant difference in student performance as measured by course grades between students who chose to use an online homework system and students who chose to complete homework using traditional methods.

The population in this study consisted of 53 female students enrolled in financial accounting in academic year 2014-2015. The research project was conducted at a women’s college in the southeastern United States, and all participants were female. There were 28 students who bought MyAccountingLab and 25 students who chose not to do so. Most participants were sophomores (66%) followed by juniors (23%) and seniors (11%). Student performance as measured by the semester course grade consisted of the student’s average on three tests given during the semester. Each test was about 60%-70% multiple choice/objective questions and 30%-40% problems. Students completed a questionnaire at the end of the semester. Users of MyAccountingLab (MAL) responded to questions about their reasons for choosing to use the online homework system, the ease of installation and use, prior experience with online homework systems, average hours of study each week, changes in study habits related to MAL, use of in-person tutoring services, and their perceptions of the effectiveness of MAL. Those who chose not to buy MAL (Non-Users) responded to questions about their reasons for not choosing it, prior experience with online homework systems, average hours of study each week, use of in-person tutoring services and whether MAL should be mandatory for future students. We also collected student course grades and GPAs.

RESULTS AND DISCUSSION

An independent-samples t-test compared differences between the users and non-users. As shown in Table 1, there was a significant difference in the GPA for users compared with non-users, but there was no significant difference in the self-reported study hours each week or the final course grade.

Table 1: Comparison of Student Users’ and Non-Users’ GPA, Study Time, and Course Grade

Student Characteristics		Mean	Sd	T	Df	Significance Level
GPA	Users	3.211	0.483	-2.991	40	***
	Non-users	2.778	0.446			
Self-reported study hours per week	Users	4.10	2.843	0.631	51	
	Non-users	4.60	2.940			
Course grade	Users	80.3	10.941	-1.162	51	
	Non-users	77.0	9.772			

*This table compares student characteristics of users and non-users of MyAccountingLab. *** indicates significance at 0.01 level.*

Because the final course grade might be influenced by a student’s use of the institution’s Learning Center, accounting tutors in the Business School, by previous experience with online homework systems in other courses, or even by interest in the subject as evidenced by declared major, we conducted a two-sample z test of proportion to compare differences between the two groups. As reported in Table 2, students who did not use MyAccountingLab were more likely to use the Learning Center and accounting tutors, but the difference was neither sizable nor significant.

The non-users were less likely to have previous experience with other online homework managers and less likely to be Business School majors, but these differences were also not significant.

Table 2: Comparison of Previous Experience and other Learning Support

Background/Support	Users	Non-Users	Z	Significance Level
Visited the Learning Center	10.7%	16.0%	0.567	
Received help from accounting tutors	25.0%	28.0%	0.247	
Previous experience with online hw manager	78.6%	68.0%	-0.871	
Business School major (acc, bus, eco)	85.7%	76.0%	-0.902	

This table shows previous experience with online homework systems, other learning support, and major of users and non-users. None were significant.

A linear regression explored whether the use of an online homework manager significantly increased a student’s final course grade. The dependent variable was the Course Grade and the three independent variables were: MAL (the use of an online homework manager) GPA, and Major (a dummy variable that takes the value of 1 if the student is majoring in accounting, business, or economics). The regression model is as follows:

$$\text{Course Grade} = \beta_0 + \beta_1(\text{MAL}) + \beta_2(\text{GPA}) + \beta_3(\text{Major}) + \varepsilon \tag{1}$$

The results of the regression in Table 3 showed a significant positive relationship between GPA and the final course grade. However, there was a significant negative relationship between the use of an online homework manager and the final course grade. ($R^2 = .63$, $F(3, 38) = 21.81$, $p = .036$). Holding constant the student’s major, students who chose to use an online homework manager were more likely to have a lower course grade than those who did not use MyAccountingLab.

Table 3: Relationship between Course Grade and the Use of an Online HW, GPA, and Major

	Coefficient Estimate	Std. Error	T Stat	Significance Level
Intercept	23.00	7.05	3.26	***
MAL (use of online homework manager)	-5.50	2.53	-2.17	**
GPA	18.26	2.35	7.78	***
MAJOR (1 if accounting, bus, or econ)	3.63	3.61	1.01	
$R^2 = 0.632 \quad F(3,38) = 21.81 \quad p = 0.000$				

*This table shows the regression analysis results. $\text{Course Grade} = \beta_0 + \beta_1(\text{MAL}) + \beta_2(\text{GPA}) + \beta_3(\text{Major}) + \varepsilon$ **, *** indicates significance at the 0.05 and 0.01 levels respectively.*

We then added the self-reported hours spent studying (Hours) to the model to determine how using an online homework manager (MAL), study time per week (Hours), GPA, and Major affected the course grade. The regression model is as follows:

$$\text{Course Grade} = \beta_0 + \beta_1(\text{MAL}) + \beta_2(\text{GPA}) + \beta_3(\text{Major}) + \beta_4(\text{Hours}) + \varepsilon \tag{2}$$

Again, there was a significant positive relationship between GPA and the final grade and there was still a significant negative relationship between the use of an online homework manager and the final course grade. ($R^2 = .65$, $F(4, 37) = 17.47$, $p = .000$). Table 4 presents the results of adding study time to the regression. Holding constant the student’s major and hours of study, students who chose to use an online homework manager were significantly more likely to have a lower course grade than those students who did not use MyAccountingLab.

Table 4: Relationship between Course Grade and the Use of Online HW Manager, GPA, Major, and Study Time

	Coefficient Estimate	Std. Error	T Stat	Significance Level
Intercept	22.32	6.95	3.21	***
MAL (use of online homework manager)	-5.018	2.508	-2.00	**
GPA	17.836	2.326	7.67	***
MAJOR (1 if accounting, bus, or econ)	2.971	3.578	0.83	
HOURS (time spent studying per week)	0.554	0.369	1.50	
$R^2 = 0.654$ $F(4,37) = 17.47$ $p = 0.000$				

This table shows the regression analysis results. $Course\ Grade = \beta_0 + \beta_1(MAL) + \beta_2(GPA) + \beta_3(Major) + \beta_4(Hours) + \epsilon$ **, *** indicates significance at the 0.05 and 0.01 levels respectively.

Introducing “voluntariness” into the course by allowing students to decide whether to buy an online homework system adversely affected student performance as measured by course grades. To understand why the use of an online homework system and course grades were negatively related, we examined the differences among the students who opted to buy MyAccountingLab. A sizeable majority of students positively perceived the experience of using an online homework manager. They reported that their confidence increased (75% agreed or strongly agreed) as they gained experience with the program. They believed that it was effective in improving their test scores (71.4% found it very effective or somewhat effective). They reported that they would recommend it to a friend (92.9% were likely or somewhat likely to do so). However, student behavior changed as the semester progressed with 75% reporting that their study habits changed. Table 5 reports the ways in which their study habits changed.

Table 5: Changes in Study Habits after Using the Online Homework System

Spent Less Time on This Element (Mark all That Apply)	Number Reporting	Percentage
Homework problems	9	42.9%
Reading the textbook (or online version included with MAL)	9	42.9%
Included supplements (Demo Docs, Help-Me-Solve-This, Video Tutorials)	5	23.8%
Additional problems similar to homework assignments	4	19.0%
Re-reading or reviewing class notes	2	9.5%
*(21 of 28 users reported changes; some reported more than one change)		

This table shows changes in study time as students gained more experience with the online homework system.

As the semester continued, students reported spending less time on homework problems and reading the textbook. The online homework manager provides a structured environment in which students often choose the correct answer from a set of choices in a drop-down box. Students value the immediate feedback but may be tempted to take a shortcut by repeatedly choosing an answer until they find the correct value. It then appears the student has “learned” the material but cannot apply that knowledge on a test. We next examined differences in the reasons for buying an online homework manager. Our survey asked students to identify all the reasons they chose to buy and then select one as the “most important.” Table 6 shows these reasons ranked by the most important reason to buy according to those students who used MyAccountingLab. The ability to “get immediate feedback on homework” was the most important reason to buy the online homework manager. It is possible the online homework manager is more attractive to less motivated students. The immediate feedback feature, when misused, allows students to spend less time on homework. They lead themselves to believe that they have mastered the material but their performance on tests is adversely affected.

Table 6: Most Important Reason to Buy an Online Homework System According to Users

Most Important Reason	Number	Percentage
Getting immediate feedback on homework	12	42.9%
Raising my grade	9	32.1%
Ability to get help on demand	5	17.9%
Access to extra practice problems	1	3.6%
Other (list)	1	3.6%
"All of the above are important"		

This table shows the reasons students gave as the "most important" in their decision to buy the online homework system.

Because we controlled for general academic achievement by using GPA, students who wanted immediate feedback were not necessarily the "weaker" students in the class. We found no evidence that frustration with the technology was significant. As shown in Table 7, a sizable majority found MyAccountingLab easy to install and navigate. Once they began to use it, 68% used it for every chapter.

Table 7: Student Users' Perceptions of the Ease of Use of Online Homework Manager (N=28)

Item	Strongly Agree or Agree	Strongly disagree or Disagree	Neither Agree or Disagree
The setup/installation of MAL was easy.	26 (92.9%)	1 (3.6%)	1 (3.6%)
The navigation of MAL site was clear and I had no problem finding what I was looking for.	22 (78.6%)	1 (3.6%)	5 (17.9%)
Once set up, I used MAL for every chapter.	19 (67.9%)	1 (3.6%)	6 (21.4%)

This table shows students users' perceptions of the ease of use of the online homework system.

Controlling for GPA, major, and hours of study, those students who chose to use an online homework manager were significantly more likely to have a lower course grade than those who used a traditional homework method. Yet, the users of the online homework system rated MyAccountingLab very high (4.0 out of 5) on its effectiveness in helping them improve their grade. Self-selection bias may influence effectiveness when students can voluntarily choose to buy an online homework system. Our result supports Agarwal and Prasad (1997) which found the acceptance and use of technology is influenced by whether or not it is mandatory, especially early in the adoption. If the use of an online homework manager is not a course requirement, students may not take it seriously. Further, in this study, the primary student motivation to use the system was to get "immediate feedback on homework." These students reported changing their study habits over time, especially the time spent on reading the textbook or doing homework.

CONCLUSIONS AND FUTURE DIRECTION

The results of this small study suggest that there is a significant, negative relationship between the voluntary use of an online homework manager in financial accounting and student performance as measured by course grades. Further exploration of the relationship between voluntary usage of online homework systems and student learning is warranted. For instance, further studies might include other homework managers beyond MyAccountingLab. Our results may have been affected by the number of attempts allowed when requesting feedback. Performance could be improved if students were given multiple attempts for practice problems, but allowed only one chance to prepare certain other problems. This would eliminate the possibility of students randomly selecting answers until they hit upon the correct one and would ensure that students gave the homework their best efforts. The setting of maximum time limits for practice problems and graded problems would promote wise use of time by students and help them prepare for timed examinations. Finally, because the research occurred at a women's college and all participants were female, it is possible that the results would have been different at a co-educational institution. In this study, a sizable number of students may have wanted to lessen the burden of learning as measured by the importance they placed on "getting immediate feedback" from their purchase of

MyAccountingLab. The instructor may want to monitor more intently the time spent by each student. The instructor can then intervene if the student is not sufficiently engaged with the homework manager. This sends a signal to students that the instructor regards the online homework as essential to their success in the course, and provides motivation for them to increase their participation.

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BIOGRAPHY

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