

Student Performance in Intermediate Accounting: A Comparison of the Effectiveness of Online and Manual Homework Assignments

Darius Fatemi

Northern Kentucky University

Linda Marquis

Northern Kentucky University

Sonia Wasan

Zayed University

Abstract

Several studies have compared the performance of students using an online homework system (OHS) to that of students submitting their homework under the traditional method of a manual homework system (MHS), and have found inconclusive results. But there is no study that investigates the role of an OHS in intermediate accounting courses. In this paper, we compare student exam performance across two sections of Intermediate Accounting II, taught by the same professor, where one section submits all the homework using an MHS, and the other submits the same assignments using an OHS. We find that students using an OHS perform significantly better in the problems, but they perform significantly worse on the multiple choice questions (MCQ). The MCQs were designed to test for a deeper understanding of the course material. The results indicate that although students grasp the mechanics in completing the problems better in the OHS, they gain a better understanding of the conceptual issues and are involved in more critical thinking in the MHS. We offer a discussion of the causes for our findings and their implications for accounting education.

I. Introduction

Several studies have investigated the impact of online homework assignments on student performance in introductory financial accounting classes and have found inconclusive results. But there is no study that investigates the role of an online homework system (OHS) in student performance for intermediate accounting courses. In this paper, we investigate differences in student exam performance across two sections of Intermediate Accounting II, taught by the same professor, where one section submits all the homework manually and the other uses an OHS to submit the same homework assignments. We find that students that submit online homework assignments perform significantly better in the problems, but they perform significantly worse than students who submit all homework manually in the multiple-choice questions. The multiple-choice questions were designed to test for a deeper understanding with regard to the course material. The results of the study indicate that although students manage to grasp the steps involved in completing the problems better in the OHS, they gain a better understanding of the deeper issues of these problems and are more involved in critical thinking in the manual system. We argue that this result is due in part to the fact that in the manual system, the students are forced to read the book in order to understand the homework problems before

doing them, unlike the OHS where they are given drop-down boxes, hints and several attempts to do the homework. We conclude that manual assignments foster a deeper learning of the material.

The use of an OHS in accounting classes has been a topic of much debate. Professors of accounting classes are quick to note the advantages afforded by such a system, but are cautious regarding the implementation because the potential downsides are unclear. Mirroring the wide variety of opinion seen in members of the faculty, published research has also been inconclusive.

In an OHS, students typically complete their homework assignments by going to a textbook-specific website that has been set up by the instructor. In this site, instructors choose which textbook problems to assign. While each student can have the same assignment, instructors often have the option of assigning the problems algorithmically, such that the numbers provided in the questions vary across students. The algorithm creates an extra layer of difficulty for students wishing to simply copy another student's answer, making it more likely that a student will attempt the work individually. This, by itself, provides one advantage to an OHS: in a traditional homework arrangement (which we will often refer to as a manual homework system, or MHS), students hand in paper copies of their homework and can more easily copy another person's work because the correct answer is the same for all students.

A second advantage to the OHS arises from the immediate feedback a student can receive on their work. This feedback comes in multiple forms. Depending on the settings allowed by the instructor, a student can submit their homework several times before the due date, each time receiving information as to which questions were answered correctly. As a result, it is readily apparent to students where their weaknesses exist. In a pencil-and-paper system, students are often unaware of which problems they have missed until the graded work has been returned to them. However, by this time, they are usually already on another chapter and thinking about a subsequent set of material. The OHS allows a student to assess their weaknesses in a timely manner and, importantly, address these weaknesses before moving on to other topics. This can be especially significant when the previous topics are vital toward understanding subsequent material. In addition, it reduces the likelihood that incorrect reasoning becomes ingrained in a student.

An OHS also supplies students with hints and links to sections of a textbook that are related to the assigned problems. As a result, students can locate explanations more expediently than under traditional methods. A more efficient use of time can then enable students to spend a higher percentage of their study time on material that the instructor considers important for the course.

In addition to the direct advantages to the student, an OHS is also beneficial for administrative reasons. It can be directly helpful to the instructor because it eliminates the need for grading. This is a task that many instructors consider to be a less fulfilling part of their job and that consumes a large amount of time. The OHS grades the homework for students, assigning weights to problems as dictated by the professor. The OHS also makes it easier to operate courses completely online, an increasingly common practice as institutions strive to meet the needs of students who cannot visit campus in the traditional manner.

As a corollary to the time saved in grading, the professor also no longer needs to spend time in class going over the solutions. An OHS typically provides many options for feedback for the students, and professors can enable the system to provide not only the solutions, but also explanations of the answers. This can be obtained by the student either immediately after submitting their final attempt on the homework or after the due date has passed. In either case, time spent in class can then be devoted to other matters, including more practice of the next topic or more details on a given topic. In addition, the professor can use the extra time to cover a larger amount of material or for in-class discussion.

Nonetheless, an OHS comes with potential disadvantages. First, an OHS creates technical difficulties arising from the occasional downtime of the online system. In addition, students can be frustrated by the fact that answers may be marked incorrect by an OHS simply due to a difference in rounding between the student and the automated system. More importantly, an OHS provides students with drop-down boxes for journal entry titles and can supply links to

hints and relevant sections of the textbook. There are strong arguments in support of such aid to the students – after all, few accounting instructors believe that there is one, and only one, appropriate title for many accounts. Given the wide variation in practice of account titles, the existence of a drop-down list prevents students from agonizing over less important details. The links to relevant sections of the textbook may also help by enabling a guided and more direct study pattern for the student. However, by reducing the amount of time a student spends formulating a solution to a problem, the OHS may be eliminating a crucial step of the learning process. The student in this situation spends less time thinking about the problem and the concepts involved, and both of these factors can undermine their understanding. The smaller amount of time spent on a problem could potentially reduce the degree to which the material is ingrained in them, and circumvention of the need to independently identify the issues in a problem may prevent a student from gaining a solid conceptual grasp of the material.

The current study examines the balance between the advantages and disadvantages of an OHS by comparing students' exam performance in two different sections of an accounting class taught by the same instructor. One class submitted all homework assignments using pencil and paper, whereas the other class submitted all assignments in an OHS. This study adds to existing literature examining the merits of an OHS not only by providing more data on the subject, but by extending the study to Intermediate Accounting II. Previous studies have involved other fields, or in accounting, they have focused on the performance of students in introductory classes. This study addresses the role of an OHS for a particular subset of students that have all already demonstrated a commitment to, and proficiency with, accounting through the completion of numerous classes leading up to Intermediate Accounting II. In addition, this study provides further nuance by analyzing the impact of an OHS on two different types of accounting questions.

We find that students who complete the OHS do better than those on the MHS when assessed by their ability to solve exam problems. This is notable because the exam problems do not provide guided answers like the OHS. Evidently, even though the students received guided tips in solving their homework problems, the absence of these tips on the exams does not undermine their performance. Rather, the guidance in the OHS appears to have directed the students to the relevant material and enabled them to efficiently learn the techniques required for problem solving.

However, a different result emerges when examining the performance on multiple-choice exam questions. These questions were formulated to test a student's conceptual understanding of the material and were quite unlike any homework problem. Students who completed their homework assignments in an OHS performed worse than those who submitted their assignments manually. It is apparent that the manual homework forced students to consult the textbook and determine for themselves what the relevant issues were, engaging in a higher degree of critical thinking, and this led to enhanced understanding of the conceptual issues in a given topic.

Our results suggest that a hybrid homework system may be optimal for student learning. The advantages of an OHS in providing guidance to a student are beneficial in solving accounting problems, and they save class time that can be used for other important material. On the other hand, the manual system that forces students to determine a solution in an unguided manner leads to improved conceptual understanding.

The rest of the paper proceeds as follows: in Section II, we discuss previous literature and develop our hypotheses. Section III explains the research design and discusses the results. Section IV concludes with some thoughts on the implications of our findings, along with suggestions for future research.

II. Literature Review and Hypothesis Development

In spite of the increased prevalence of the OHS in academia, the literature on the cost and benefits of these systems has provided mixed results. This section examines the findings from prior studies on the use of an OHS, as well as

findings from related studies that, while not directly comparing an OHS to the MHS, bear relevance to the choice of a homework system. Finally, we formulate our predictions for the current study.

Note that even the role of graded homework in affecting student performance is not understood entirely, and questions have long existed over its efficacy. Vruwink and Otto (1987) discussed the expectancy theory (Porter and Lawler 1968) that would predict improved exam performance arising from an incentive to complete homework, but they observed that providing introductory financial accounting students with an increased motivation to complete additional homework was unrelated to subsequent learning measures. On the other hand, Eskew and Faley (1988) and Rayburn and Rayburn (1999) have shown that additional homework improves student learning.

Some studies have focused entirely on different types of feedback and compared their effectiveness. While the current paper is undertaken to compare the online and manual systems, it is instructive to look at the results of an OHS under different settings as well. Lindquist and Olsen (2007) used three different levels of feedback for graded homework. In the low-feedback setting, only correct and incorrect indicators were provided to students at the conclusion of an assignment. In a moderate setting, students could obtain check figures as they completed their assignment. Finally, other students were given solutions upon submission of their homework. The authors found that those in the low-feedback setting perceived the highest level of learning (while also expressing the greatest frustration with the process), but they did not observe a difference in test performance across the three settings.

Phillips and Johnson (2011) also compared two forms of automated feedback, albeit in a less common approach. In one setting, students operated under a computerized intelligent tutoring system, while others completed their homework using a standard OHS. The authors found that students using the intelligent tutoring system to complete their homework assignments gained a higher mastery of the material as measured by exam scores.

The influence of the mere availability of an OHS (as opposed to a direct comparison to an MHS) has also been studied. Some investigations have focused on settings within secondary education. For example, Wong (2001) compared the effects of computer- and paper-based homework assignments on multiple levels of student success in mathematics in secondary schools and found that the accessibility of online aid and the provision of immediate feedback made an OHS beneficial. However, the focus of our literature review concerns that of students in post-secondary education given that they should differ in numerous ways. For example, college students have already self-selected into a group that has completed high school and determined to voluntarily pay for and obtain further education, yielding a different set of students in terms of motivation and ability.

In a course on the principles of economics, Lee et al. (2010) found that making an OHS available to students improved learning for those with a grade of 'B' or higher. These results lend some insight into the fact that not all students are impacted equally by different homework systems. They also mirror the findings of other work (e.g., Eskew and Faley 1988; Rayburn and Rayburn 1999) suggesting that additional homework improves student learning.

Peng (2009) reports a finding that is related to the Lee et al. (2010) work. Specifically, Peng (2009) used an OHS in an introductory accounting course and also found evidence that the online system affects students differentially. Students with lower levels of motivation (a lower "need for cognition") and greater confidence in their proficiency with computers reported the OHS to be more useful. The author did not examine whether this led to an improvement in learning, but one might expect that, at least for students who appreciated the OHS, an increased level of learning could result from greater study time. The fact that students can be differentially affected by alternative teaching methods is consistent with a long history of research in educational psychology (e.g., Gage and Berliner 1975.)

Studies have compared the performance of students using an OHS to those using an MHS in a variety of disciplines. Bonham et al. (2001) found no difference in the learning outcome in physics students. In a subsequent study, Bonham et al. (2003) observed that students using a traditional homework system performed better than those using an OHS, while Dufresne et al. (2002) and Cheng et al. (2004), also using physics students, determined that an OHS improves student learning. Mixed results have also been found in chemistry: Arasasingham et al. (2005) observed

increased learning under an OHS relative to an MHS, but Fynewever (2008), also examining chemistry students, found no difference between the two systems.

In a study of individuals enrolled in a business statistics course, Palocsay and Stevens (2008) observed no impact on test performance arising from the choice of whether the homework system was offered online. Conversely, Chua-Chow et al. (2011) found that students of business statistics absorbed the material better using an OHS than under an MHS. In an introductory finance course, Smolira (2008) found that an OHS encouraged students to spend more time studying. While this is not direct evidence of an improvement in learning, it is suggestive of an advantage for the OHS. Presumably, an increased amount of study time leads to greater understanding of the material.

Gaffney et al. (2010) conducted a study of introductory accounting students, comparing the performance of those in a section that completed their homework online to those that manually turned in their assignments. The authors concluded that an OHS resulted in a higher proficiency with the course material. It should be noted that Friedman (1981) investigated the effect of homework systems in intermediate accounting students; however, the computer system used in that study was quite different from the OHS of today, and it incorporated a custom-made computer program that still required students to manually record journal entries.

Results from prior research are suggestive that an OHS can be beneficial to student learning, although the mixed results make this finding tenuous. It is instructive to note, however, that while a number of studies find no difference between the different mechanisms by which homework is delivered, the ones that do find a difference more often find an advantage for the OHS. In our study, one may expect benefits that are similar to those found in prior research, but no study of an OHS has investigated a sample of strictly upper-level accounting students.

Presumably, all of these students possess both quality in their study habits and a proficiency for the material, characteristics that should set them apart from accounting students observed in past studies. At this level, it is especially uncertain as to whether an OHS enhances understanding.

Our study directly compares the performance of students who complete their assignments using an OHS to those who complete them on paper. It can be argued that an OHS should improve exam performance on accounting problems because an OHS allows a student to study in a more targeted manner, with links that take them directly to relevant sections of the textbook. Furthermore, students are given immediate feedback as to whether their attempts are correct so that they can correct their errors, and previous work has suggested that early feedback improves learning (Kulik and Kulik 1988). This avoids the issue of allowing incorrect reasoning to persist in a student up until the time they would have received their graded manual homework, minimizing the chance of faulty understanding becoming ingrained. In addition, the immediate feedback allows a student to understand the material while studying that particular topic, which is important when subsequent material builds on previous work. As well, the algorithmic method of an OHS prevents students from mindlessly copying another student's work, ensuring a minimal level of effort. Finally, the time that is saved in class from going over the homework enables the instructor to devote time more specifically to the material that needs the most reinforcement. Consequently, our first hypothesis is as follows:

H1: Students completing their homework using an OHS will perform better on exam problems than those completing their assignments in an MHS.

However, the OHS comes with distinct disadvantages. In particular, the drop-down boxes cause forms to be pre-filled with suggested possible answers, giving students a head start on solving a given problem. The fact that the problems come with links to the relevant sections of the textbook provide even further guidance to the students, making them aware of the issues in a problem immediately. Because students do not have to spend time grasping the nature of the problem, they will spend less time having to sort through the concepts involved in the course material. As a result, their conceptual understanding should be greater when they complete their assignments using an MHS.

As the multiple-choice exam questions used in the current study test a student's conceptual understanding, we propose the following hypothesis:

H2: Students completing their homework using an MHS will perform better on exam multiple-choice questions than those completing their assignments in an OHS.

III. Research Design and Results:

Our study was conducted over the course of two semesters of Intermediate Accounting II, in fall 2010 and spring 2011. Each semester was taught by the same instructor, used the same textbook, and assigned the same homework problems. The major difference between the two semesters was the homework system, with one (fall 2010) using traditional methods of pencil and paper and the other (spring 2011) using one in which all of the homework was submitted online. In the OHS, students were given three attempts to submit their homework and were also allowed to check their work three times, allowing a total of six trials before receiving a final grade. During the course of solving the problems, they were also able to click on a link taking them directly to a section of the electronic textbook that pertained to the problem. After the final submission of a homework assignment, a student would receive the answers to the problems along with an explanation of the solutions. While an OHS is common to many textbook publishers (e.g., CengageNow, Connect), this particular study used the WileyPlus system.

For the dependent variables, we compared the performance of the students on identical questions given in each semester. Further, we broke the questions down into two categories relating to student performance on multiple-choice questions and conventional accounting problems (shown in Appendix A). In our analyses, we controlled for gender, GPA, and credit hours.

The questions have been broken down into two categories because of the contrasting answer formats and consequent requirements for the student. The first set of questions shown in Appendix A each have one correct answer that can be selected from four options, whereas the second set all required journal entries. Note that none of the multiple-choice questions (MCQs) constitute questions about appropriate journal entries even though this is technically feasible in that question format. Rather, they test for a more conceptual level of understanding that goes beyond accounting mechanics.

In our study, we made a comparison of the scores earned by students in the multiple-choice questions (MCQs) and problems that were common to both sections. Students of both sections (manual and online) were tested on the MCQs and problems over the three exams that were given to the students during the semester. We note that the entirety of exams given during the semester were not identical. Hence, we picked questions that were common to both sections and compared student performance only for these MCQs and problems.

In order to keep the common set of questions secure between semesters, several safeguards were instituted. This was essential in order to minimize the chance that an improvement would occur in the spring semester simply because students had access to the questions from the previous fall. First, during exams, students were only permitted to have a pencil, a four-function calculator distributed by the professor, and the exam booklet. Because cell phones were banned from use even for their calculator function, students were unable to use them to take pictures of the exam. Similarly, the limitation of paper to just the booklet handed out by the professor prevented students from writing down exam questions or notes that could be taken out of the classroom. Second, the professor placed strict limitations on the amount of exam material available to students when they were informed of their grades. Students could observe their point breakdown in the next class meeting in order to determine their weak areas, but even in this class meeting, students only received their answers – the pages containing the exam questions were maintained by the professor in order to prevent students from taking pictures of or copying the exams. Third, after students were informed of their grades, the professor re-collected the answers from each student in order to prevent subsequent students from viewing the answers and making inferences regarding the exam questions. In order to strengthen to effectiveness of these preventative measures, the professor was always present in the room when exam materials were on student desks, and the small classrooms facilitated monitoring. This procedure has been followed by the

professor since that date with no indication that exam security has yet been compromised. Further evidence of the effectiveness of these measures is provided by the fact that, while performance on the MCQs improved in the spring, this result did not occur for the problems (In fact, the performance on the problems deteriorated after controlling for GPA and gender.), even though a release of exam material should have benefited each question type equally.

The descriptive statistics indicate that the mean percentage score earned by the students in the problems is 63.63% with a median of 65.7%. The mean percentage score earned by the students in the MCQs is 50.15% with the median being 44.4%. It is evident that the level of difficulty of the MCQs was significantly higher than that of the problems. The students have a mean GPA of 3.24 with a median of 3.278. The students were almost evenly distributed with regard to gender, as 55.4% were male and 44.6% female. Most, 93.2%, of the students were accounting majors and the rest were non-accounting. The average (median) hours earned by the students in the college are 114.04 (107.5) with a minimum of 73 and a maximum of 219 hours.

Table 2 reports the results of the t-test that compares the mean scores earned by the students in the problems and the MCQs across the two sections. The results of the t-test indicate that while there is no significant difference in the average scores earned by the students in the problems across the two sections, (t-test = -0.55; p-value = 0.5841), the average score of the students in the MCQs is significantly higher for the section that made manual submissions of the homework assignments (t-test = 2.54; p-value = 0.0132) as compared to the students that attempted the homework in the online system.

Table 3 reports the Pearson's correlation coefficient among the variables used in the study. It is worthwhile to note that the coefficient of correlation between the variables MCQ and SECTION is significantly negative indicating that the MHS section scores significantly higher than the OHS section in the MCQs (note that the variable SECTION is a dichotomous variable that takes the value of 1 if the student belongs to the section that was given online homework assignments and 0 if the student belongs to the section that was given manual homework assignments). Since, the coefficient of correlation between the variables PROBLEMS and SECTION is insignificant (though negative), nothing conclusive can be said about the correlation between the two variables. As expected, there is a strong positive correlation between the GPA and MCQ/PROBLEMS indicating that the higher the GPA earned by students in the past, the better is their score in the MCQs and problems. This suggests that student potential and their level of motivation seem to significantly drive student performance. The variables MCQ and PROBLEMS are also strongly positively correlated suggesting that students who tend to score well in the problems also perform well in the multiple choice questions. As substantiated in the regression results, male students appear to perform better than female students as indicated by the strong positive correlation between the variable GENDER and MCQ/PROBLEMS.

Table 4 represents the regression results of the following regression model:

$$PROBLEMS = \alpha_1 + \alpha_2 Section + \alpha_3 GPA + \alpha_4 Gender + \alpha_5 Hours + \varepsilon$$

The coefficient estimate of SECTION is positive and significant at 10% (t-stat = 1.181, p-value = 0.075) indicating that students belonging to the OHS section perform significantly better in the problems than the students who submitted all homework manually. Please note that SECTION is a dichotomous variable that takes the value of 1 if the student belongs to the OHS and 0 otherwise. This result is obtained after controlling for several variables that are likely to influence student performance such as the GPA earned by them, the number of credit hours they have earned in the undergraduate program, and their gender.¹ The variable GPA is also positive and significant at 1% (t-stat= 5.27, p-value < 0.000) suggesting that student performance is significantly positively associated with their

¹ We also tried to control for their major (whether they were accounting or non-accounting students) but since there was no significant change in the regression results, we did not include them in the study.

overall GPA at the start of the semester. It is obvious that high-performing students tend to score better in Intermediate Financial Accounting-II.

Table 5 represents the regression results of the following regression model:

$$MCQ = \alpha_1 + \alpha_2 Section + \alpha_3 GPA + \alpha_4 Gender + \alpha_5 Hours + \epsilon$$

In this regression, the coefficient estimate of SECTION is negative and significant at 5% (t-stat -2.020, p-value = 0.047) indicating that students performed better in the MCQs in the manual system as opposed to the online system of homework submission. The variable GPA is once again positive and significant at 1% (t-stat= 3.95, p-value < 0.000) suggesting that student performance is significantly positively associated with their overall GPA at the start of the semester.

It is very important to point out that the MCQs tested the in-depth knowledge of the students with regard to the course. Collectively, the results of our study indicate that whereas an OHS system prepares students to solve problems efficiently by allowing them several attempts, hints and drop-down boxes to attempt the problems, the manual system fosters a deeper understanding of the material because it forces students to read the textbook to understand the material while doing the homework. We recommend that the OHS must be accompanied with some manual homework so that a fair portion of the homework is worked by the students without any aids such as hints, online lectures, pre-prepared formats or additional attempts.

IV. Conclusion:

The use of an OHS has greatly increased in recent years, not only in accounting, but throughout post-secondary education. This prevalence should only magnify for a variety of reasons. More students are being offered the opportunity to receive a college education without a traditional campus, both as a convenience to the student and as additional revenue to the institution. Professors are struggling to find a way to meet the multiple demands of their jobs and welcome an opportunity to reduce grading time. In accounting, in particular, the breadth of material that is included in a typical intermediate accounting class continues to grow as standards become more detailed, and the ability to save time in class through an OHS can help to meet this challenge.

However, it remains an unresolved question as to whether an OHS actually enhances student learning. This study contributes to the literature by providing the first study of students in an upper level accounting course, comparing the exam performance of those who use an MHS to those who use an OHS. We examined this topic in two classes of Intermediate Accounting II taught by the same instructor. We probe with further detail by breaking down the performance across two types of exam questions, and we control for gender, GPA, and previous credit hours.

We find that students who use an OHS perform better on conventional accounting problems, suggesting that the directed studying and immediate feedback of an OHS expedites student learning. However, on multiple-choice questions designed to test a student's conceptual understanding of the material, students who use a manual homework system achieve higher scores. We suggest that this is due to the fact that the 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. Our results suggest that a combination of both a manual and online homework system would be ideal for student learning.

The study leaves many open questions. For example, the ideal mix of manual and online homework is undetermined. In fact, addressing this question is impossible without first addressing a precursor – just how important is a conceptual understanding relative to the ability to solve conventional problems? Those who would argue that the conceptual understanding is of supreme importance might conclude that all homework should be assigned manually, while someone with a different set of priorities might determine just the opposite. On the one hand, a conceptual understanding should enable an accountant to tackle a broad range of unforeseen accounting problems, while a large amount of work that accounting graduates perform can often be mechanical and more like

the conventional exam problem. These questions highlight a fundamental debate on what should constitute the primary goals in accounting education.

Future research should analyze the advantages of an OHS in finer detail. For example, there are a wide variety of parameters that can be set in an OHS, and this study only used one such setting. A study that varied the timing of the feedback, the availability of hints and textbook links, and the number of opportunities to check one's work might find different results. Such an investigation would also help to establish exactly what part of an OHS is beneficial or detrimental to student learning, and further, through what mode this impact occurs (e.g., whether it is due to active learning, motivation and engagement, memory reinforcement, or time spent on problem formulation). In addition, future work should examine student performance in more than one outcome measure (e.g., problem identification and resolution in memos or case summaries), because exam performance is not the sole indicator of a student's ability to practice accounting. Further, this study only included a comparison of two semesters using one professor, so replication would be valuable, as well as information as to whether these findings are instructor-dependent. In addition, an increased number of students would lend insight on the manner in which individual characteristics affect the outcome. Peng (2009) and Lee et al. (2010) found that an OHS can impact students differentially, so the optimal homework system may not be the same for each individual. Finally, further studies should extend to additional areas of accounting. In Intermediate Accounting II, many of the topics do not directly build on each other, covering such items as investments, leases, taxes, and pensions. An accounting course in which the need to understand a previous chapter has special bearing on the ability to comprehend subsequent material might yield a different result, especially when the immediate feedback of an OHS is touted as one of its advantages. Nonetheless, our results suggest that an OHS appears to be a valuable part of an accounting curriculum. However, its role, and optimal implementation, is unsettled, and our results suggest that it should not completely replace traditional methods of homework assignment.

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Table 1 - Descriptive Statistics (N = 74)

Variable	Mean	Median	Std Dev	Minimum	Maximum
Problems	63.631	65.700	15.519	20.000	100.000
MCQ	50.149	44.400	17.004	11.100	100.000
GPA	3.240	3.278	0.437	2.356	3.988
Gender	0.554	1.000	0.500	0.000	1.000
Major	0.932	1.000	0.253	0.000	1.000
Hours	114.037	107.500	26.418	73.000	219.350

This table represents the descriptive statistics of the variables used in the study. The variable PROBLEMS represents the percentage points earned by the student in a set of problems given in the exams. The variable MCQ represents the percentage points earned by the student in the multiple-choice questions given in the exams. GENDER is a dichotomous variable that takes the value of 1 for a male gender and 0 for female. SECTION is a dichotomous variable that takes the value of 1 if the student belongs to the section that was given online home assignments and 0 if the student belongs to the section that was given manual home assignments. GPA represents the GPA earned by the students at the start of the semester in which they take the Intermediate Accounting-II class.

Table 2 - T-Test for the Comparison of Mean Scores of Students in the Problems and the MCQ

Section	Manual HW Mean	Online HW Mean	T-Test	P-Value
Problems	62.354	64.41	-0.55	0.5841
MCQ	56.357	46.37	2.54	0.0132

The variable PROBLEMS represents the percentage points earned by the student in a set of problems given in the exams. The variable MCQ represents the percentage points earned by the student in the multiple-choice questions given in the exams.

Table 3 – Pearson Correlation Coefficients (N = 74)

This table presents the Pearson Correlation Coefficients among the variables used in the study.

		Pearson Correlation Coefficients					
		N = 74					
		Problems	MCQ	Section	GPA	Hours	Gender
Problems		1					
MCQ		0.43195***	1				
	P-Value	0.0001					
Section		-0.07297	-0.29637***	1			
	P-Value	0.5395	0.0109				
GPA		0.55121***	0.43898***	-0.17935	1		
	P-Value	<.0001	0.0001	0.129			
Hours		-0.13411	-0.00894	0.07641	0.28186**	1	
	P-Value	0.258	0.9401	0.5205	0.0157		
Gender		0.25457**	0.24711**	-0.16216	0.08839	0.00385	1
	P-Value	0.0297	0.0351	0.1705	0.4571	0.9742	

The variable PROBLEMS represents the percentage points earned by the student in a set of problems given in the exams. The variable MCQ represents the percentage points earned by the student in the multiple-choice questions given in the exams. SECTION is a dichotomous variable that takes the value of 1 if the student belongs to the section that was given online home assignments and 0 if the student belongs to the section that was given manual home assignments. GPA represents the GPA earned by the student at the start of the semester in which they take the Intermediate Accounting-II class. GENDER is a dichotomous variable that takes the value of 1 for a male gender and 0 for female.

Table 4 – Regression Results for PROBLEMS (N = 74)

This table presents the regressions results of the following regression model:

$$PROBLEMS = \alpha_1 + \alpha_2 Section + \alpha_3 GPA + \alpha_4 Gender + \alpha_5 Hours + \varepsilon$$

Variable	Estimate	T-Stat	P-Value
Intercept	-8.811	-0.580	0.566
Section	5.611	1.810	0.075 *
GPA	18.955	5.270	0.000 ***
Gender	8.152	2.700	0.009 ***
Hours	0.027	0.450	0.653
Adj R-sq = 0.3287			

The variable PROBLEMS represents the percentage points earned by the student in a set of problems given in the exams. The variable MCQ represents the percentage points earned by the student in the multiple-choice questions given in the exams. SECTION is a dichotomous variable that takes the value of 1 if the student belongs to the section that was given online home assignments and 0 if the student belongs to the section that was given manual home assignments. GPA represents the GPA earned by the student at the start of the semester in which they take the Intermediate Accounting-II class. GENDER is a dichotomous variable that takes the value of 1 for a male gender and 0 for female.

Table 5 – Regression Results for MCQ (N = 74)

This table presents the regressions results of the following regression model:

$$MCQ = \alpha_1 + \alpha_2 Section + \alpha_3 GPA + \alpha_4 Gender + \alpha_5 Hours + \varepsilon$$

Variable	Estimate	T-Stat	P-Value	
Intercept	-11.064	-0.620	0.534	
Section	-7.287	-2.020	0.047	**
GPA	16.467	3.950	0.000	***
Gender	5.917	1.69	0.0957	*
Hours	0.080	1.17	0.2453	
<hr/>				
Adj R-sq	= .2468			

The variable PROBLEMS represents the percentage points earned by the student in a set of problems given in the exams. The variable MCQ represents the percentage points earned by the student in the multiple-choice questions given in the exams. SECTION is a dichotomous variable that takes the value of 1 if the student belongs to the section that was given online home assignments and 0 if the student belongs to the section that was given manual home assignments. GPA represents the GPA earned by the student at the start of the semester in which they take the Intermediate Accounting-II class. GENDER is a dichotomous variable that takes the value of 1 for a male gender and 0 for female.

Appendix A

Common Exam Questions

Multiple Choice Questions

- 1) Which statement regarding goodwill is true?
 - a. Goodwill can be defined as the value attached to the ability of a company to earn a higher than normal rate of return on the book value of its identifiable net assets.
 - b. Goodwill is an unidentifiable intangible asset.
 - c. In some situations, GAAP requires that amounts should be recorded as negative goodwill.
 - d. Internally developed goodwill should be capitalized while purchased goodwill should be expensed.

- 2) A requirement for a security to be classified as held-to-maturity is
 - a. ability to hold the security to maturity.
 - b. positive intent.
 - c. the security must be a debt security.
 - d. All of these are required.

- 3) A reclassification adjustment is reported in the
 - a. income statement as an Other Revenue or Expense.
 - b. statement of comprehensive income as other comprehensive income.
 - c. statement of stockholders' equity.
 - d. stockholders' equity section of the balance sheet.

- 4) A debt security is transferred from one category to another. Generally acceptable accounting principles require that for this particular reclassification (1) the security be transferred at fair value at the date of transfer, and (2) the unrealized gain or loss at the date of transfer currently carried as a separate component of stockholders' equity be amortized over the remaining life of the security. What type of transfer is being described?
 - a. Transfer from available-for-sale to held-to-maturity
 - b. Transfer from available-for-sale to trading
 - c. Transfer from held-to-maturity to available-for-sale
 - d. Transfer from trading to available-for-sale

- 5) Jordan Co. purchased ten-year, 10% bonds that pay interest semiannually. The bonds are sold to yield 8%. One step in calculating the issue price of the bonds is to multiply the principal by the table value for
 - a. 10 periods and 8% from the present value of 1 table.
 - b. 10 periods and 10% from the present value of 1 table.
 - c. 20 periods and 4% from the present value of 1 table.
 - d. 20 periods and 5% from the present value of 1 table.

- 6) The fair value option allows a company to
 - a. record an increase in income when the fair value of the bonds it has issued increases.
 - b. report most financial instruments at fair value by recording gains and losses as a separate component of stockholders' equity.
 - c. value its own liabilities at fair value.
 - d. All of the above are true of the fair value option.

7) A company using a perpetual inventory system neglected to record a purchase of merchandise on account at year end. This merchandise was omitted from the year-end physical count. How will these errors affect assets and net income for the year?

	<u>Assets</u>	<u>Net Income</u>
a.	No effect	No effect
b.	No effect	Understate
c.	Understate	No effect
d.	Understate	Understate

8) Which of the following disclosures is required for a change from an accelerated depreciation method to the straight-line method?

- Recomputation of current and future years' depreciation
- Restatement of prior years' income statements
- The cumulative effect on prior years, net of tax, in the current retained earnings statement
- All of these are required.

9) Which of the following statements is correct?

- A change from expensing certain costs to capitalizing these costs due to a change in the period in which benefits are expected to occur, should be handled as a change in accounting estimate.
- Changes in accounting principle are always handled in the current or prospective period.
- Correction of an error related to a prior period should be considered as an adjustment to current year net income.
- Prior statements should be restated for changes in accounting estimates.

Problems

1) Bogart Co. borrowed \$40,000 in cash by issuing a four-year non-interest-bearing note, with a face value of \$40,000, to a customer. In addition, Bogart agreed to sell inventory to the same customer at reduced prices over the four-year period. Bogart's borrowing rate was 8%, giving the note a present value of \$29,400. Prepare Bogart's journal entry for the issuance of the note.

2-3) On December 31, 2010, Bogart Corporation is able to make its scheduled interest payment, but it is unable to pay the principal, which is due on that day. All National Bank agrees to restructure the \$1,200,000, 12% note receivable issued at par by:

- making the new principal \$750,000, payable in four years
- lowering the interest rate to 10%, with the first payment due in one year.

The present value of the restructured cash flows on December 31, 2010 (calculated using a market rate of 12%) is \$704,440.

2) Prepare any journal entry that Bogart would record on December 31, 2011 (one year after the restructuring).

3) Prepare any journal entry All National Bank would record on December 31, 2011.

4-5) Consider each of the unrelated bond transactions described below:

- 4) On August 1, 2011, Lane Corporation called its 10% convertible bonds for conversion. The \$8,000,000 par bonds were converted into 320,000 shares of \$20 par common stock. On August 1, there was \$700,000 of unamortized premium applicable to the bonds. The fair value of the common stock was \$20 per share. Ignore all interest payments, and assume that Lane uses the book value method. Write down Lane's entry to record the conversion.
- 5) Packard, Inc. decides to issue convertible bonds instead of common stock. The company issues 10% convertible bonds, par \$3,000,000, at 97. The investment banker indicates that if the bonds had not been convertible they would have sold at 94. Record the issue of the bonds.

6-8) Korman Company has the following securities in its portfolio of trading equity securities on December 31, 2010:

	Cost	Fair Value
5,000 shares of Thomas Corp., Common	\$155,000	\$139,000
10,000 shares of Gant, Common	182,000	190,000
	\$337,000	\$329,000

All of the securities had been purchased in 2010. In 2011, Korman completed the following securities transactions:
 March 1 Sold 5,000 shares of Thomas Corp., Common @ \$31/share less fees of \$1,500.
 April 1 Bought 600 shares of Werth Stores, Common @ \$45/share plus fees of \$550.

The Korman Company portfolio of trading equity securities appeared as follows on December 31, 2011:

	Cost	Fair Value
10,000 shares of Gant, Common	\$182,000	\$195,500
600 shares of Werth Stores, Common	27,550	25,500
	\$209,550	\$221,000

Prepare the general journal entries for Korman Company for:

- (6) the 2010 adjusting entry.
- (7) the sale of the Thomas Corp. stock.
- (8) the 2011 adjusting entry.