

A Quantitative Study of the Effect of Web-Based Tutorials on the Achievement of  
Learning Outcomes and Student Satisfaction in Online Accounting Courses

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by

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Approval Page

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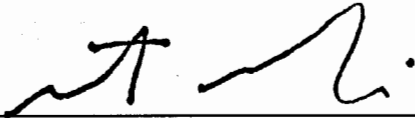


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## Abstract

This study was conducted to explore the effect of the usage of web-based tutorials on the achievement of learning outcomes and course satisfaction in online accounting courses. Analysis was also conducted to identify whether course level impacted the effect of the usage of web-based tutorials on the achievement of learning outcomes. Currently, the academic impact of the usage of web-based tutorials' effect on the achievement of learning outcomes in online accounting courses is not well understood. The purpose of this quantitative, non-experimental, correlational study was to determine whether web-based tutorials affect student satisfaction or the achievement of learning outcomes in online accounting courses, and whether course level moderates the relationship between utilization of web-based tutorials and final course GPA. The study was based on archival data collected by National University, including final course GPAs for students completing financial accounting, and intermediate accounting I, II, and III, both utilizing web-based tutorials and those courses, which did not utilize web-based tutorials. This study found that web-based tutorials did not affect either the achievement of learning outcomes or student satisfaction. Additionally, course level did not have a moderating impact on the achievement of learning outcomes. However, there were several notable limitations to this study including the scope of the data as well as variables which were not controllable. A literature review is presented, which examines the effectiveness of components of web-based tutorials including immediate feedback, the inclusion of short videos, and the appeal to a wide variety of learning styles. The literature review demonstrates that components of web-based tutorials positively affect both student satisfaction and the achievement of learning outcomes. Additional research is warranted to further explore the benefits of web-based tutorials. It would be meaningful to conduct

studies with a larger number of students, pre- and post-tests, and controls over course presentation. The study of online pedagogy is necessary because an ever increasing percentage of learners are choosing online education. Additional study of the impact and implementation of web-based tutorials will help universities improve course delivery methods and student satisfaction. College students must enter the workforce prepared to contribute in a rapidly evolving global economy.

## Acknowledgements

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## Chapter 1: Introduction

Higher education has undergone a much needed transformation, based on both consumer demand and technological advances (Chen, Jones & Moreland, 2010). Many universities offer both fully on-line and blended courses, which include an online component (Chen, Jones & Moreland, 2010). Currently, the annual growth of online course enrollments at 10% far exceeds the 2% annual increase in on-site enrollments (Koohang & Paliskiewicz, 2013). Online education will likely become a standard educational method, fully integrated into mainstream education (Sener, 2010). Additionally, there is insufficient evidence specifically demonstrating the effectiveness of online accounting courses (Dereshiwsky & Rich, 2011). The rapid growth of online education, coupled with the fact the delivery method is a significant and expanding component of higher education, makes it important to develop, implement and test appropriate pedagogy. Effective pedagogy enables students to thrive in this new environment.

Online education has intrinsic challenges, which are far different from face-to-face education (Grace, Hankins, Suarez-Brown, & Turner, 2012). Although instructors are present and interact throughout the course with both individual students and the class as a whole, the format of that interaction is significantly different from brick and mortar classrooms. Faculty fills the role of facilitators rather than deliverers of course content. An important question for both faculty and administration interested in maintaining academic quality is whether all courses are appropriate in an online environment (Grace, Hankins, Suarez-Brown, & Turner, 2012). Some universities question whether technical courses, such as accounting, where faculty interaction and lectures are perceived to be

critical to students' success, can be effectively delivered through solely online instruction (Grace, Hankins, Suarez-Brown, & Turner, 2012).

Meanwhile, universities are held accountable for producing well-educated and independent thinking, problem solving employees who are keys to companies' survival in the evolving competitive global market (Donmez, Erdogan, Kutluk, & Utky, 2012). Both business and accounting industries are undergoing significant changes (Donmez, Erdogan, Kutluk, & Utky, 2012). Critical thinking and problem solving skills are necessary for accountants of this generation (Gulmez & Kutluk, 2012). Technological savvy is an additional requirement. Today's universities strive to produce employees equipped to excel in this new business world; online education will be a critical component. Universities should develop appropriate online pedagogy to fulfill the needs of current and future accounting students and the businesses they will join.

Investigating the impact of web-based technology on the achievement of learning outcomes may assist universities in the development of robust and effective academic accounting programs (Fajardo, 2014). Understanding the differences, if any, in student achievement between lower level and upper level accounting courses is instrumental in scaffolding programs and increasing persistence in online programs (Backhaults & Fisher, 2011). Additionally, comparisons of students' course satisfaction would likely provide meaningful information for program development (Maksy, 2012). Identifying tools, which enhance the performance and learning of accounting students in the online environment, will help universities develop the best pedagogy, a necessary element in producing the most prepared students (Fajardo, 2014).

## **Background**

Students' needs, and the methods employed by higher education to meet those needs, are quickly evolving (Backhaults & Fisher, 2011). While students are expected, albeit required, to acquire skills making them competitive in the challenging global environment, they are doing so as single parents, often working at least one job, and older than in the recent past (Brown, 2006). Students struggle with both personal and professional commitments that previous college students seldom worried about (Yelvington, Weaver, & Morris, 2012). Online education has offered a valuable option where there might have been none (Yelvington, Weaver, & Morris, 2012). Online education has become commonplace at the majority of both two and four year institutions of higher education.

In fact, new enrollments in online education have outpaced new enrollments in brick-and-mortar classrooms (Chen, Jones, & Moreland, 2010). Students taking online classes are increasing at a rate ten times greater than the increase in on-site students (Mulig & Rhame, 2012). This increase brings the concerns about students' achievement of learning outcomes in the online environment to the forefront (Khanlarian & Singh, 2014). The number of students enrolled in online programs calls into question the quality of the online programs. It is increasingly important that the quality match or exceed that of traditional educational settings.

Universities, and the accounting industry, are concerned that learning results from online education is comparable to that gained in face-to-face classes, and that the learning meets industry demands (Chen, Jones, & Moreland; Bali, 2014; Lay, 2008, Salimi, 2007). Student academic and professional readiness, completion rates, and gainful employment

are key university goals (Heider, 2015). Online class sizes and course offerings are outpacing face-to-face classes, bringing the concerns about students' achievement of learning outcomes in the online environment to the forefront (Khanlarian & Singh, 2014). Additionally, the accounting education industry recognizes that gaps exist in the current pedagogy and that the teaching and learning methods must be re-evaluated (Young & Warren, 2011).

Currently, the predominantly utilized teaching and learning style is passive, dominated by lectures and problems worked as examples and then replicated by the students in homework and on exams (Young & Warren, 2011). Students are not required to use critical thinking skills to solve accounting scenarios. New approaches are needed to develop a strong foundation in technical content as well as critical thinking and problem solving (Lay, 2008). Technology advances have made alternative and supplemental course delivery methods possible in ways not even imagined years before (Perera & Richardson, 2010).

Once an educational institution decides to expand the accounting program to the online environment, one begins the process of developing robust courses, where students are guaranteed at least the same knowledge and skill acquisition as their peers attending brick and mortar facilities (Schwandt, 2014). Additionally, the industry is striving to close the gap between industry expectations and the performance of accounting graduates (McLellan, 2014). The relationship between theory and practice should be examined. Specifically, from a pedagogical perspective, one must examine the link between theory and application or, more simply put, knowing and doing (Schwandt, 2014).

Significant differences exist in the learning modalities between on-site and online. However, there are not necessarily meaningful differences between online and on-site learners (Schwartz, 2012). One must carefully evaluate the effectiveness of different pedagogy. Merely replicating the on-site course delivery techniques, and adapting them to the online environment, is not wholly effective (Fajardo, 2014). At the same time, accounting is a field where practice and demonstration of problems has always been considered key to students' success (Lay, 2008). The broad problem affecting both universities and students is how the achievement of learning outcomes can be improved in online accounting classes. In order to study the effect of web-based tutorials, it is important to discuss how learning outcomes might be measured and how those measurements relate to industry requirements (Duncan, Kenworthy, & McNamara, 2012).

One methodology of particular interest for online accounting courses is web-based tutorial programs (Perera & Richardson, 2010; Morgan, 2013; Watty, Jackson, & Yu, 2010). These tutorial programs, developed by several textbook publishers, offer dynamic features (Morgan, 2013; Dockter, 2012; Hahn, Fairchild, & Dowis, 2013). Web-based tutorial programs offer online mini-lectures as well as the ability to perform homework and tests online. Problem based lessons, encouraging students to reach a higher level of understanding, are easily assigned and completed by the students (Dockter, 2012; Farley, Jain, & Thomson, 2011; Doorn, Janssen, O'Brien, 2010; Watty, Jackson & Yu, 2010; Fajardo, 2014). The programs also enable students to interact with faculty, via email with links to the assignments, when specific questions arise. The usage of these tutorials, and their impact on the achievement of course learning outcomes and

student satisfaction, will enable universities to develop appropriate and effective online pedagogy.

### **Statement of the Problem**

The specific problem of interest is that the academic impact of the usage of web-based tutorials on the achievement of learning outcomes and course satisfaction in online accounting courses is not currently well understood. An expressed concern is that online tutorials in web-based instruction can remove faculty from the lessons and reduce student interaction, leading to decreased effectiveness of the learning experience (Liz & Rhame, 2012). Additionally, the reduced interpersonal interaction may hinder students' development of much needed interpersonal skills and creativity (Cheng & Swanson, 2011). However, the immediate feedback incorporated into web-based tutorials may enhance both students' achievement of learning outcomes as well as student satisfaction (Basioudis & Lange, 2009). Additionally, the students' active participation in the course, enhanced by web-based tutorials, may lead to better exam scores, demonstrating a more solid mastery of course learning outcomes. An increased mastery of course outcomes may enhance students' ability to apply concepts to analyze financial statement information or to produce financial statements (Basioudis & Lange, 2009; Folami & Simons, 2012; Doorn, Janseen, & O'Brien, 2010).

A significant 31% of higher education learners have taken at least one online course (Koohang & Paliszkievics, 2013). Sixty-five percent of higher education institutions include online education as a major component of their long-term strategic growth plan (Koohang & Paliszkievics, 2013). Online learning is becoming an integral



part of higher education. Effective online pedagogy is necessary for universities to produce employees equipped to excel in a challenging global business environment.

### **Purpose of the Study**

The purpose of this quantitative, non-experimental, correlational study was to determine whether the use of web-based tutorials is related to student satisfaction and the achievement of learning outcomes in online accounting courses, and whether controlling for course level affects any such relationship. The study examined the effectiveness of web-based tutorials on learners enrolled in both lower level and upper level accounting courses to determine if there is any difference in effectiveness when used in higher level accounting courses versus lower level accounting courses. Financial accounting was used as the lower level class and intermediate accounting I, II and III were used for the higher level accounting classes.

The study was comprised of undergraduate, online students from National University. National is a non-profit university headquartered in California. Although many students who attend this university live in California, because the program is online, it is likely that students were included from a variety of locations within the United States. Additionally, there is a heavy military presence in the student body. Therefore, it is also possible that students participating in the study were stationed outside of the United States.

Two groups of students were studied: undergraduate students enrolled in entry level accounting courses and undergraduate students enrolled in higher level accounting courses. The entry level accounting courses included financial accounting. The higher level accounting courses included intermediate I, II III. A total of 528 students were

included in the study: 278 students enrolled in courses without web-based tutorials and 250 students enrolled in courses with web-based tutorials. Groups studied included full class sections.

### **Research Questions**

Limited substantive research has been conducted examining whether there is a significant difference between the achievements of course outcomes and student satisfaction when web-based tutorials are utilized in online accounting classes (Dereshiwsky & Rich, 2011). Developing and utilizing effective pedagogy in the online environment is critical for improving both student persistence and accounting knowledge (Chen, Jones, & Moreland, 2010). Examining whether there are differences between course levels when utilizing web-based tutorials may provide universities with key information in the development of robust online accounting programs. The research questions being addressed in this study are as follows:

**Q1:** What is the difference, if any, between final course grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials?

**Q2:** Does course level moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses?

**Q3:** What is the difference, if any, between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials?

### **Hypotheses**

The three hypotheses being tested are:

- H1<sub>o</sub>:** There is no difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials.
- H1<sub>a</sub>:** There is a difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials.
- H2<sub>o</sub>:** Course level does not moderate the relationship between utilization of web-based tutorials and final course grade in online accounting classes.
- H2<sub>a</sub>:** Course level does moderate the relationship between utilization of web-based tutorials and final course grade in online accounting classes.
- H3<sub>o</sub>:** There is no difference in student satisfaction in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials.
- H3<sub>a</sub>:** There is a difference in student satisfaction in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials.

### **Nature of the Study**

This study provides insight as to the impact, if any, web-based tutorials have on the achievement of learning outcomes and course satisfaction in online accounting courses, and whether moderating for course level affects such a relationship. The study was based on final course GPA and course delivery methodology collected and archived by National University. The archived data was collected by the University analytics department, by course section, and was provided without personal student identification

information. Indications were included as to whether web-based tutorials were utilized in the course. The independent variable was the usage of web-based tutorials in online accounting courses. The dependent variable of student outcomes was defined to be the final course GPA, which was measured on a numerical scale. The moderating variable was the course level, defined as the difference between financial or intermediate accounting I, II, and III. The dependent variable of student satisfaction was measured by the satisfaction score given by students on the end of course evaluations, and ranged from the 0-5.

Archived data was analyzed using t-tests to compare differences between student satisfaction scores and final grades, controlling for course level. T-tests were performed to test the mean differences to the answers for each research question. A T-test compared differences between the final course grades for all financial accounting and intermediate accounting I, II, and III online classes that used web-based tutorials with all online accounting classes which did not utilize online tutorial, for the given time period. T-tests were also conducted to determine if course level was a moderating factor. For this test, t-tests were conducted to compare the difference in class GPA for lower level online accounting courses (financial accounting) versus higher level (intermediate I, II, and III) online accounting courses, both utilizing web-based tutorials and those not using web-based tutorials. Finally, t-tests were performed to determine if there was a significant difference in mean student satisfaction scores for online accounting classes utilizing web-based tutorials versus those not utilizing web-based tutorials.

The dependent variable evaluated was an interval-ratio variable as final course GPAs were expressed numerically between 0 and 4 and satisfaction scores ranged

numerically from 0 – 5. The independent variables were categorical with two values only; either web-based tutorials were utilized or they were not utilized. If there was a difference, the T-score was used to determine if the difference was statistically significant (Tomcz, Tomczak, Kleka, & Lew, 2014). If the score was statistically significant, the differences between the means most likely were not a result of chance but rather a result of the integration of web-based tutorials. Statistically significant scores indicate that the usage of web-based tutorials in online accounting classes do positively affect the achievement of the course learning outcomes or student satisfaction.

### **Significance of the Study**

The overriding meaning behind this study was to produce the best online learning environment for college accounting students. Creating this environment requires that students learn the material, feel connected with the faculty and the university, and remain motivated to pursue their education. If this learning environment is not created, student persistence will suffer and enrollment will decline. It is equally important to have satisfied students as it is to have students who learn using the online pedagogy. Satisfied students remain engaged, which increases their ability to achieve the learning outcomes.

The findings of this study will enhance online pedagogy, specifically addressing whether web-based tutorials contribute to the achievement of learning outcomes in online accounting courses. The growth in online learning requires the study and development of effective learning pedagogy. Both differences in the online learning environment as well as the online learning population warrant investigation and targeted study. Many online learners are employed full-time, enrolled in school while juggling the demands of household responsibilities and children. Some travel for work, making the option of

attending a brick and mortar university impossible. Military personnel who are often deployed or located in areas where other educational options do not exist also heavily utilize online education. It is important that institutions of higher education serve all learner populations equally well.

The population of interest was students enrolled in online accounting courses. Some students combine online courses with on-site courses. Many universities offer blended courses, which have both an online and face-to-face component. The effectiveness of the usage of web-based tutorials on the achievement of learning outcomes may apply equally to online and onsite accounting, opening up the population beyond the online environment. This study was confined to online accounting courses. The potential impact of the findings may be broadly applied to university programs.

This study focused specifically on the effect of utilizing web-based tutorials in financial accounting and intermediate I, II, and III. These courses represent different levels in an accounting curriculum. Financial accounting is an entry level course covering the basics of accounting. Intermediate accounting I, II and III are upper level courses, as well as core accounting concentration classes. Results of this study could be generalized to all online accounting classes because the mix of classes studied are a solid representation of the format and intensity of any accounting course.

Additionally, similar online tutorials exist for other technical courses such as math, economics and statistics. It is possible that the benefits accrued from the usage of web-based tutorials in online accounting courses will apply equally well to other technical courses, which students currently find particularly challenging. Universities would potentially benefit from higher persistence rates in these challenging courses.

Keeping students engaged in education and their academic programs is a primary goal of universities. Retaking classes is expensive and often a barrier for students who desire to continue their studies. Higher passage rates would benefit both the universities and the students.

Future studies may expand on this research through exploring several avenues of investigation. The use of online-tutorials in other technical courses could be evaluated to determine benefits to additional groups of learners. In addition, the effectiveness of different aspects of the pedagogy could be evaluated to determine exactly what factors produce the greatest benefits. Those elements could then be integrated into both online and onsite courses. Additionally, the study could be expanded to explore the impact of web-based tutorials on student motivation, time-on-task and persistence.

### **Definition of Key Terms**

**Accounting Concentration.** An accounting concentration includes a field of study, which includes financial accounting as well as Intermediate Accounting I, II and III (Maksy, 2012).

**Blended Course.** A blended course meets onsite fewer hours than fully on-site courses and contains an online component (Fajardo, 2014).

**Business Concentration.** A business concentration includes any business academic concentration, which excludes intermediate accounting I, II and III (Maksy, 2012).

**Course Learning Outcomes.** Course learning outcomes are the key concepts specific to the course that students are expected to demonstrate proficient knowledge of by the end of a course (Basioudis, & de Lange, 2009).

**Course Level.** Course level refers to the difference between lower level accounting courses, such as financial accounting, and higher level accounting courses, such as intermediate accounting I, II, and III (King & Mo, 2013).

**Final Course Grade.** The final course grade is the numerical grade awarded at the end of the course (Morgan, 2013).

**Objective Measurements.** Objective measurements are measurements that evaluate quantifiable data concerning student achievement (Morgan, 2013).

**Online Course.** An online course is delivered 100% online involving either asynchronous or synchronous interaction, or both, between the students and instructor or between students and students (Chen, Jones, & Moreland, 2010).

**Student Satisfaction.** The measurement, on a scale of 0 – 5, given by the student at the end of the course to indicate their level of satisfaction with the given course (Chen, Jones, & Moreland, 2010).

**Subjective Measurements.** Subjective measurements are measurements that evaluate student's feelings and motivation (Chen, Jones, & Moreland, 2010; Bowan, Gulacar, & King, 2014).

**Web-Based Tutorial.** A web-based tutorial is an online program, which allows students to work homework problems, receive immediate feedback and includes videos, demonstration problems, and faculty feedback (Morgan, 2013; Dockter, 2012; Hahn, Fairchild, & Dowis, 2013).

## Summary

The purpose of this study was to determine if there was a significant difference between the achievement of learning outcomes or student satisfaction in undergraduate



online financial and intermediate accounting classes when web-based tutorials are included. Additionally, differences between students' performance when enrolled in a lower level accounting course versus a higher level accounting course was studied. The questions answered include: What is the difference, if any, between final grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials? Moderating for course level, what is the difference, if any, between final course grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials? What is the difference, if any, in course satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials?

The study of accounting is challenging. Determining the most efficient and effective way to help students achieve the course learning outcomes benefits both the accounting industry and academics. Evaluating the impact web-based tutorials has on the achievement of learning outcomes provides significant pedagogical strategy for Universities tasked with educating future accountants. The findings of this study may help identify pedagogy, which will enhance online learning. Identifying tools that enhance the performance and learning of accounting students in the online environment will help universities develop the best pedagogy, a necessary element in producing the most prepared students (Fajardo, 2014). The most effective academic programs produce the most qualified future employees and leaders.

## Chapter 2: Brief Review of the Literature

This section examines current research concerning web-based technology in online courses. The evaluation includes several perspectives. First, the benefits to the academic community overall will be explored. Then the attractive learning features of web-based tutorials will be identified and analyzed, including specifically the use of online video clips, the appeal to different learning styles and the effects of immediate feedback. Both subjective and objective research will be discussed. Finally, differences in the impact of course level and academic concentration will be explored along with obstacles to evaluation.

### Benefits to the Academic Community

Both the necessary skills and student demographics are changing (Backhaults & Fisher, 2011). Students must acquire skills preparing them to make professional contributions in a global environment. Student demographics are also changing. College populations stretch beyond the previously typical 18-22 year olds who are moving away from home for the first time and living in college dorms (Brown, 2006). College students are older, working adults, often-single parents. They have busy lives and time demands, including family obligations and professional careers. Sitting in a classroom several nights during the week is not a realistic option (Yelvington, Weaver, & Morris, 2012). Many of these students have turned to on-line education as a viable option. Online education can additionally reach thousands of learners who travel, such as military personnel and others living in rural areas without easy access to university classrooms (Yelvington, Wever, & Morris, 2012).

Initially pioneered by market-funded universities, such as University of Phoenix and DeVry University, online education has rapidly expanded to private, state and non-profit universities. Many universities offer both fully on-line and blended courses, which include an online component (Chen, Jones, & Moreland, 2010). Online education is growing exponentially and has become a reality at the majority of both two-year and four-year degree granting colleges and universities. More than a third of the institutions offer completely online degree programs (Chen, Jones, & Moreland, 2010; Salimi, 2007; Mulig & Rhame, 2012). Online class sizes and course offerings are outpacing face-to-face classes. The increase in students taking online classes is increasing at a rate ten times greater than the increase in on-site students (Mulig & Rhame, 2012), bringing the concerns about students' achievement of learning outcomes in the online environment to the forefront (Khanlarian & Singh, 2014).

At the same time, the accounting industry's professional needs are changing, as the world becomes a more global economy. There may be a theoretical gap between industry demands and the academic teachings for accounting. In other words, there is a difference between industry needs and what is being produced from the current accounting education. Businesses rely on conventional practices whereas academics are teaching newer strategic plans, which are not being implemented in practice (McLellan, 2014).

Many accountants enter the work force unprepared to meet market expectations (Kutluk, Donmez, Utku, & Erdogan, 2012). The industry itself is expanding at an unprecedented rate, with students expected to graduate with a firm understanding of current practices as well as international regulations. Students are required to grapple

with continuing developments in accounting and reporting rules, requiring that they develop the necessary critical thinking and evaluation skills to meet the changes of this dynamic environment (Young & Warren, 2011; Bali, 2014).

Universities and the accounting industry are concerned that learning results from online education is comparable to that gained in face-to-face classes, and that the learning meets industry demands (Chen, Jones, & Moreland; Bali, 2014; Lay, 2008, Salimi, 2007). Student academic and professional readiness, completion rates, and gainful employment are key university goals (Heider, 2015). Online class sizes and course offerings are outpacing face-to-face classes, bringing the concerns about students' achievement of learning outcomes in the online environment to the forefront (Khanlarian & Singh, 2014). Additionally, the accounting education industry recognizes that gaps exist in the current pedagogy and that the teaching and learning methods must be re-evaluated (Young & Warren, 2011).

Likewise, concern regarding the hiring company's perceptions of online versus onsite classes is a concern. It appears that the business world readily accepts online accounting degrees. One study queried the opinions of recruiters regarding online masters of accounting degrees. It is noted that online programs have received negative accounts of diploma mills simply cranking out graduates without solid academic programs. It is also noted that even in 2004, universities acknowledged the significance of developing online programs in their growth strategies. CPA firm university recruiters were surveyed. Only firms with 10 or more professionals were included. One hundred and seven surveys were emailed to CPA firms in Georgia. The email contained a survey link. Twenty-eight firms completed the survey with a response rate of 26.17%. Of the

responding firms, two identified as national, sixteen regional and ten local. There were a median number of forty professionals in each firm. Two surveys were used – one stated the student was in a face-to-face program and the other stated the student was in an online program. Twenty-eight firms responded to the traditional MACC program survey; eleven respondents answered the online MACC program survey. The survey listed common traits of a potentially desirable candidate with the one difference being where the modality from which they earned their degree. A 7-point Likert scale was used to assess how likely the recruiter would be to recruit the candidate, ranging from not at all to very actively. The respondents were also asked to indicate how several other factors would affect their recruiting and hiring including errors on resume, telephone interview skills, accounting GPA, overall GPA, enrollment in a CPA review course, and passage of a portion of the CPA exam. Again a 7-point Likert scale was used ranging from would not interview to would actively try to hire (Metrejean & Noland, 2011).

Results indicate that there was no significant preference between online or traditional MACC programs, with online ranked slightly below traditional. The responses to the attribute portion of the survey further confirmed the findings. Both survey groups rated the type of MACC program as insignificant in the hiring decision. Passage of part of the CPA exam or being enrolled in a review course were ranked as the most attractive attributes, whereas typos in the resume and poor telephone interview skills were ranked as deal breakers.

Currently, the predominantly utilized teaching and learning style is passive, dominated by lectures and problems worked as examples and then replicated by the students in homework and on exams (Young & Warren, 2011). Students are not required

to use critical thinking skills to solve accounting scenarios. New approaches are needed to develop a strong foundation in technical content as well as critical thinking and problem solving (Lay, 2008). Technology advances have made alternative and supplemental course delivery methods possible in ways not even imagined years before (Perera & Richardson, 2010). It is observed that there is significant benefit in the students learning from each other. Problem solving together is one of the most effective learning tools available and lends itself perfectly to online delivery. The use of a variety of technology is critically important in today's professional environment. Working in the online environment hones both the academic and professional skills necessary in today's workplace (Brown, 2006).

Once an educational institution decides to expand the accounting program to the online environment, administration and faculty begin the process of developing robust courses, where students are guaranteed at least the same knowledge and skill acquisition as their peers attending brick and mortar facilities (Schwandt, 2014). Additionally, the industry is striving to close the gap between industry expectations and the performance of accounting graduates (McLellan, 2014). The relationship between theory and practice should be examined. Specifically, from a pedagogical perspective, one must examine the link between theory and application or, more simply put, knowing and doing (Schwandt, 2014).

Significant differences exist in the learning modalities between on-site and online. However, there are not necessarily meaningful differences between online and on-site learners (Schwartz, 2012). One must carefully evaluate the effectiveness of different pedagogy. Merely replicating the on-site course delivery techniques, and

adapting them to the online environment, is not wholly effective (Fajardo, 2014). At the same time, accounting is a field where practice and demonstration of problems has always been considered key to students' success (Lay, 2008).

The broad problem affecting both universities and students is how the achievement of learning outcomes can be improved in online accounting classes. In order to study the effect of web-based tutorials, it is important to discuss how learning outcomes might be measured and how those measurements relate to industry requirements (Duncan, Kenworthy, & McNamara, 2012). The next section will discuss relevant research in this field related to the achievement of learning outcomes through online, web-based tutorials. Specifically, findings, and gaps in research, will be discussed.

### **Attractive Learning Features**

One methodology of particular interest for online accounting courses is web-based tutorial programs (Perera & Richardson, 2010; Morgan, 2013; Watty, Jackson, & Yu, 2010). These tutorial programs developed by several textbook publishers, offer dynamic features (Morgan, 2013; Dockter, 2012; Hahn, Fairchild, & Dowis, 2013). Web-based tutorial programs offer online mini-lectures as well as the ability to perform homework and tests online. Problem based lessons, encouraging students to reach a higher level of understanding, are easily assigned and completed by the students (Dockter, 2012; Farley, Jain, & Thomson, 2011; Doorn, Janssen, O'Brien, 2010; Watty, Jackson & Yu, 2010; Fajardo, 2014). The programs also enable students to interact with faculty via email with links to the assignments, when specific questions arise. This

allows instructors the opportunity to respond quickly and effectively to specific student questions.

Options for interaction with course tools may improve overall course performance. One study explored whether online tools such as course materials, links and discussions improved students' performance on the final exam. The purpose of the study was to determine what, if any, online course enhancements were beneficial to students' achievement of learning outcomes, as indicated through scores on the final exam. Three hypotheses were tested: the relationship between time online and performance, the relationship between online tools accessed and performance, and the frequency of interactions and students in the online environment and performance.

The research sample was taken from 600-second year accounting students enrolled in a corporate accounting course at an Australian university in 2007. Approximately 600 students were studied. The students were not aware of participation in the study and they were only identified to allow for matching in the University's database. Data was gathered from the online learning platform records Blackboard WebCT.

Results of this study revealed that students' interaction with online tools do enhance their outcomes in the course, as measured by the final exam scores. The results of the study are useful because they indicate that the specific online tools selected can impact student success. It appeared that the online tools most closely related to core course concepts were most effective.

There were several limitations in this study. First, it only involved students in one course at one university. Due to the limited scope, the results may not be extrapolated to



other universities, courses, or perhaps even instructors. Second, the study did not include sufficient online tools to best determine the most helpful resources. Because the study was a blended course, part online and part onsite, students' class attendance would have altered the results. Presumably, the students who attended class more frequently would also earn higher marks on the final exam. No differentiation was made between students with good or exemplary attendance versus those with poorer attendance (Perra & Richardson, 2010).

A common faculty concern, and potential limitations to course quality, is the amount of time required to teach in the online environment as well as techniques to make delivery better and more efficient. One also recognizes that online teaching pedagogy and course development differs from teaching face-to-face. Due to the increased enrollment and the fact that online education is here to stay, the study of online course delivery pedagogy and faculty training and mentorship is critical to universities' financial success and students' academic success. It is noted that online course development requires as much as fifty percent more time than face-to-face course development. Likewise, teaching online requires up to twice the amount of time as instructing a face-to-face course.

For example, one study examined Pearson's eCollege platform and the items included in the learning platform, discussing both what each element is, how it was useful, as well as the students' perceptions of the tools. Recorded mini-lectures and recorded solving of accounting problems were recommended additions. Benefits of Pearson's online homework manager were discussed, including the benefits of automatic feedback and easy review of students' work. It is noted that online course development

requires as much as fifty percent more time than face-to-face course development. Likewise, teaching online requires up to twice the amount of time as a face-to-face course (Liz & Rhame, 2012).

Online tutorials address critical issues that may make a meaningful difference in students' engagement and learning. Immediate feedback is provided for all problems worked, allowing the students to address any weakness in their learning of the course content, far prior to the taking the exams (Richards-Babb, Henry, & Robertson-Honecker, 2011). The same feedback is available to faculty in easy to read and use dashboard reports. Faculty can easily pinpoint exactly where students are struggling as the students engage in the course content (Heider, 2015; Hahn, Fairchild, & Dowis, 2013). Instructors also have the ability to see how long each student has been engaged in the course as well as what sections each student has worked on and where they may be having difficulty through a dashboard report.

The students are engaged in a dynamic learning environment that likely encourages a high level of interaction. The students direct their own learning through the development of personal learning plans and the option for working additional problems to reinforce concepts (Heider, 2015; Chen & Swanson, 2011; Morgan, 2013; Xhao, Wardeska, McGuire, & Cook, 2014). Learning may be intensified when students are given the opportunity to develop their individualized learning experiences (Heider, 2015; Zhao, Wardeska, McGuire, & Cook, 2014; Farley, Jain, & Tomson, 2011). Web-based tutorials provide the opportunity for students to view an individualized dashboard showing content mastery, time-on-task, and areas where difficulties are identified (Heider, 2015; Chen & Swanson, 2011; Morgan, 2013).

Additional attractive features include the integration of multi-modal content delivery methods including reading, brief videos and demonstration problems (Heider, 2015; Chen & Swanson, 2011; Morgan, 2013; Sargent, Borthick, & Lederberg, 2011). The way students interact with their world and learn is changing. Static textbooks have become outdated for younger college learners, many of which used eBooks and adaptive learning programs during their K-12 education (Heider, 2015; Sargent, Brothick, & Lederberg, 2011). These students thrive in a dynamic digital environment, utilizing multi-media and adaptive practice and learning. Web-based tools are a familiar learning modality for a large group of college learners (Heider, 2015; Morgan, 2010; Zhao, Wardeska, McGuire, & Cook, 2014; Chen, Jones, & Moreland, 2010).

From a course development and ethics perspective, web-based tutorials allow the selection of homework problems that are similar, rather than identical, to the textbook problems, eliminating the possibility of cheating by locating the solutions manual (Basioudis & De Lange, 2009; Pundak, Schcham, & Herscovitz, 2013). Academic integrity is a significant concern in online programs. The dynamic use of problem assignment extends to testing as well. Computer generated numbers and questions, testing identical concepts through the use of similar problems, help to assure academic integrity in both the learning and the testing environment (Doorn, Janssen, & O'Brien, 2010; Pundak, Shacham, & Herscovitz, 2013). Doing one's own homework not only protects the academic integrity of the course, but likely also increases the students' achievement of the learning outcomes.

Web-based tutorials allow greater, and more pinpointed, personal interaction with faculty (Heider, 2015; Pundak, Shacham, & Hercovitz, 2013). Immediate and targeted

feedback allows students to focus efforts on areas of weakness (Doorn, Janssen, & O'Brien, 2010). The personal interaction, coupled with targeted feedback, seems to enhance both student satisfaction and performance (Doorn, Janssen, & O'Brien, 2010). The model approaches a "just-in-time" teaching method where the instructor is provided with the tools and information to target the assistance provided to students at the time the assistance is most valuable (Pundak, Shacham, & Hercovitz, 2013). Faculty members are able to divert time previously spent grading students' assignments toward targeted and personalized assistance (Pundak, Shacham, & Hercovitz, 2013; Doorn, Janssen, & O'Brien, 2010; King & Mo, 2013).

### **Use of Online Video Clips**

The impact of online video clips has been a subject of research, both within online tutorials as well as separately integrated into online courses. Faculties are looking for ways to engage students in the course material as well as techniques to apply their learning to the professional world, extending the concepts beyond academics. Short video clips, used as an instructional tool, are shown to engage students and help to produce excitement about learning the concepts (Stephen, 2015; Yi-Hsuan, Hsiao, & Chin-Husan, 2014; Ljubojevic, Vaskovic, Stankovic, & Vaskovic, 2014). Video clips can include not only learning concepts but also current events, which demonstrate the significance of the concepts studied (Stephen, 2015). Video is shown to activate emotions, which is often impossible through merely reading the textbook. Although video is not a means for replacing the textbook, it may be an outstanding ancillary tool for stimulating student interest, reinforcing key learning concepts, as well as connecting the concepts to the professional world (Stephen, 2015).

Videos including self-tests provide the opportunity to boost comprehension through replay as well as to engage students, boost understanding and decrease mind-wandering through mini-quizzes and checks for understanding. Checks for understanding and integrated mini-quizzes may enhance information recall (Schacter & Szpunar, 2015). Research has demonstrated that students may inaccurately monitor their own learning, meaning that the students' perception of their understanding of the concepts may exceed their actual performance based demonstration of their understanding. Research has demonstrated that students are overly optimistic concerning their actual learning. Integrated checks for understanding may help to align the students' actual understanding with their perceived understanding (Schacter & Szpunar, 2015). If a student realizes that they do not, in fact, understand a specific topic well, they will be more likely to repeat the lesson and reinforce their understanding of the concepts (Schacter & Szpunar, 2015). Research has demonstrated that students who do not utilize self-tests and checks for understanding who assessed their own comprehension levels at 78% actually performed dramatically lower, scoring 48%. Whereas, students utilizing self-tests and checks for understanding assessed their comprehension levels at 77% and actually performed at 75% (Schacter & Szpunar, 2015).

Additionally, the integration of mini-quizzes may help students better retain concepts learned. Mini-quizzes not only draw students' attention to key concepts, the cognitive retrieval of those concepts may enhance long-term retention of the information (Schacter & Szpunar, 2015). In fact, it is theorized that the recall of the information during checks for understanding and mini-quizzes may be more effective than additional study for learning and recalling the information learned (Schacter & Szpunar, 2015).

Even more significantly, the retrieval of key concepts learned has been demonstrated to translate beyond the specific material being tested and to increase the retrieval rate and transfer of ancillary knowledge (Schacter & Szpunar, 2015). Finally, the retrieval of key information may enhance learning and retention of additional course concepts (Schacter & Szpunar, 2015). Research suggests that groups utilizing video integrated checks for understanding and mini-quizzes performed substantially higher on exams related to the same learning concepts. For example, one study concluded that student groups utilizing mini-quizzes and checks for understanding scored significantly higher (88% versus 66%) on exams and cumulative tests over the same concepts (Schacter & Szpunar, 2015). It is possible that integrating videos into the online courses will improve students' retention of learning outcomes. Potentially, a by-product of improved reflection and self-assessment may be enhanced study habits and an increased independence in the learning process (Ljubojevic, Vaskovic Stankovic, & Vaskovic, 2014).

Videos are particularly attractive for millennial students, who are flooding into institutions of higher education. Millennials are students born between the 1980's to the early 2000's (Steffes & Duverger, 2012). Unlike other generations of students, this group of learners expects to be entertained as well as informed in the educational process. Millennial learners benefit from course concepts being presented in an interesting and entertaining fashion. Taking accounting concepts and presenting them in more entertaining videos better engages this group of learners. Millennials grew up engaging online and video technology and expect that it will be incorporated into the learning process (Steffes & Duverger, 2012). Videos both entertain and instruct this large group of learners.

The engaging nature of videos is also significant because engaged students are more motivated to learn the material and do the work necessary (Lee, Hsiao, & Ho, 2014; Stephen, 2015). In the online environment, engagement and motivation are more important than in the traditional classroom because students must be self-motivated and guide their own success. Motivation not only increases student engagement, it also improves their attitude toward the course. A positive attitude helps the student take the initiative to persevere, adding to the likelihood of success and learning performance. Engaged, motivated students work more problems and are willing to spend the time necessary to be successful in the course (Lee, Hsiao, & Ho, 2014).

### **Addressing Different Learning Styles**

Web-based tutorials help address differences in student's learning styles. A student's learning style categorizes the way the learner perceives and processes information. Academic literature identified several learning styles including visual, auditory and kinesthetic (Hamdani, 2015). Visual learners learn best by images, videos and demonstrations. Auditory learners learn most effectively through what they read and hear. Kinesthetic learners require hands-on workshops, models and collaborative lessons to maximize retention (Hamdani, 2015). Most learners absorb and process information through a combination of these styles.

Alternatively, learning styles may be categorized as activists, theorists, pragmatists and reflectors (Polat, Peker, Ozpeynirci, & Duman, 2014). Activists learn best through new experiences and rely on intuition in the learning process. Listening and reading, although necessary components of education, are not the primary learning tools; actively engaging problems is more effective. Theorists do not rely on intuition. Rather,

they prefer systematic learning, preferring a plan of action. They also build knowledge through connections with conceptual models. Pragmatists enjoy taking risks and making improvements. They thrive on group discussion but become impatient when progress lags. Reflectors work best by observing the processes, interpreting the results and inferring a meaning. Planning is a critical component for their learning success (Polat, Peker, Ozpeynirci, & Duman, 2014).

A third method for categorizing learning styles is Kolb's LSI, based on experiential learning theory, widely accepted in business education research (Tan & Laswad, 2015). This theory divides learners into four categories: divergers, assimilators, convergers and accommodators. Divergers look at learning from a concrete point of view. They prefer to observe rather than directly interact. They work well in groups and prefer personal feedback. Assimilators prefer abstract concepts and are less inspired by working in groups. They excel at putting information together into a logical and detailed format. This type of learner prefers reading, lecturing and exploring analytical models. These learners are comfortable jumping into learning without having all of the answers. Convergers find practical uses for ideas and theories. These students prefer to use hypothetical-deductive reasoning to solve problems and prefer to deal with things rather than people. Finally, accommodators prefer hands-on learning and rely on information from people and intuition rather than books and lectures. These students prefer to work with groups rather than individually (Tan & Laswas, 2015).

It is challenging to address all learning modalities in traditional brick and mortar academic institutions. Classroom teaching is most often associated with the instructor lecturing and working problems while the students take notes. Active learning has



elevated the way students are taught in a traditional classroom by integrating problems based learning as well as encouraging students to participate in the learning process (Cameron, Clark, De Zwaan, et al, 2015). However, the options inside a classroom are far narrower than the learning modalities available online through web-based tutorials. Students learn most effectively when instruction is tailored to their specific learning styles (Cameron, Clark, De Zwaan, et al, 2015; Lamminmaki, O'Leary, Rae, & Sands, 2015; Rogowsky, Calhoun, & Tallal, 2015; Tan, & Laswad, 2015). There is a diverse student population in college classes, and thus wide differences in backgrounds of entering accounting students. Several teaching methods are suggested as a means to development of an enhanced accounting program (Kirkham, 2013).

Online education in general, and web-based tutorials specifically, allows the student to construct a learning environment, which meets their individual preferences. Online interactions involve both synchronous and asynchronous components. Synchronous learning involves real time-online lectures, often recorded for future student reference. Asynchronous learning utilizes discussion boards, videos, blogs, instant messaging, online lectures, PowerPoint, demonstration problems and recorded lectures. Initially modeled after onsite classes, online learning pedagogy has expanded to incorporate techniques not possible in brick and mortar settings (Shahabadi & Uplane, 2014).

Web-based tutorials allow students a variety of learning style options. The course material is delivered utilizing several pedagogical approaches. The multi-modal content deliveries methods include reading, brief videos and demonstration problems (Heider, 2015; Chen & Swanson, 2011; Morgan, 2013; Sargent, Borthick, & Lederberg, 2011).

Regardless of the learning style model used, all categories of students benefit from web-based tutorials. Web-based tutorials include links to the online textbook as well as written lectures and PowerPoint presentations covering key concept. This type of delivery inspires visual, auditory, reflectors, divergers and assimilators, who all benefit from reading course material (Shahabadi, & Uplane, 2014; Cameron, Clark, Zwaan, et al., 2015; Rogowsky, Calhoun, & Tallal, 2015; Tan, & Laswad, 2015). Unlike hard copy textbooks, the students are able to drill down and interactively work through the examples. The PowerPoint presentations and the textbooks includes an oral option, which reads the slides or textbooks, appealing to auditory learners in much the same way they would benefit from an in-class lecture.

Videos are also included, which discuss the concepts and demonstration how to work problems. Videos appeal to visual learners, reflectors, divergers, assimilators, and accommodators, who all benefit from hearing the course material, seeing demonstrations of problems and examining the details involved in the lessons (Shahabadi, & Uplane, 2014; Cameron, Clark, Zwaan, et al., 2015; Rogowsky, Calhoun, & Tallal, 2015; Tan & Laswad, 2015). Videos provide students with both a verbal and a visual representation of the concepts. The course material is described as well as problems worked. An advantage of the videos is that they may be paused and restarted allowing students to both interact and better absorb the concepts. Each student can work at their own pace, moving quickly through the videos or pausing and repeating until the student feels secure with the concepts being taught.

Demonstration problems, which work through the concepts step-by-step, appeal to visual, kinesthetic, activists, theorists, reflectors, divergers, assimilators, convergers

and accommodators (Shahabadi & Uplane, 2014; Cameron, Clark, & Zwaan, et al., 2015; Rogowsky, Calhoun, & Tallal, 2015; Tan & Laswad, 2015). By far, this method is appropriate for the largest group of learners and replaces the instructor working through problems in a brick-and-mortar classroom. In many ways, this online tool may be superior to the brick-and-mortar approach because every student is directly engaged in the material and can also pause and repeat if a concept is not understood. Whereas in a brick-and-mortar classroom, some students may be involved in problem solving, it is typically impossible to include all students. The processing time varies from student to student, which means that the quicker to respond students often move the problem solving process along more quickly than the slower processors can absorb. The web-based demonstration problems allow each student to work through and process each step of each problem, allowing each individual the time required to absorb and understand meeting each student's individual needs. The tools provided in web-based tutorials allow options for every learning style to maximize their learning potential. Furthermore, dual coding of material is superior to single coding, meaning that combining methods of presenting course material enhances learning (Steffes & Duverger, 2012).

For example, one study consisted of students enrolled in hybrid and online accounting classes at one southwest university in the Spring of 2010. Participation was randomly assigned between a control group and a treatment group. The control group was provided with text-based lectures. The treatment group enjoyed multi-media based learning modules. Both groups took pre and post-tests. Outcomes were measured using the difference between pre and post-test scores. A T-test conducted demonstrated that the outcomes of students in the eTutor group performed better than those in the lecture

group. Analysis was expanded to reveal differences in relation to learning styles. The lecture group improved for auditor and visual learning styles while the visual and kinesthetic learning styles showed greater improvement using eTutor, demonstrating that learning styles does matter in delivery methods. Even more significantly, the eTutor group, overall, earned one letter grade higher than the lecture control group (Cheng & Swanson, 2011).

Two additional studies also examined the effect of short videos on retention in principles of accounting classes, a course that all business students must take and one in which there are historically low passage rates. Three common reasons for poor performance include: intimidating class environments, low aptitude and low motivation. Three hypotheses were tested: “H1: Participation rates of tutorials by low achievers will be significant, even without course credit, H2: Students using tutorials well be less likely to drop and more likely to pass the course than non-users, and H3: Students using tutorials will improve their exam grades more than non-users.

The first study surveyed two large sections (320-seat auditorium) of principles of accounting II in the Spring of 2007. Four hundred and twenty four students participated in the first study. The study was conducted at large urban public university with a diverse student population. Three hypotheses were tested: H1: Participation, H2: Retention and Course Pass Rate, and H3: Exam Grades. H1: Participation predicted high levels of participation from low achievers. Participation was high for all groups (low achievers – 61%, mid achievers – 77.1% and high achievers – 74.7 percent. Regarding retention, a higher number of low achieving non-users dropped the course (45.8%) than low achieving users (24%). Hierarchical liner modeling was used to evaluate exam scores.

Exam score growth over the term was analyzed longitudinally as a function of tutorial use. Regression analysis was also used. Results showed that each tutorial use improved test scores.

The second study involved tutorials created and implemented in Spring 2007 and used in every section of the course for a two year period. Student performance for the two years prior to implementation was compared against performance for the two years after implementation, analyzed at the term level. This study was an extension of the first study but focused on analyzing whether tutorials were associated with continuing benefits without the weekly promotions and the students awareness that they were being studied. The withdrawal rate decreased significantly, from 18.4% to 11.3 percent. Similarly, the pre-implementation pass rate was 57.2% prior to implementation and 79.8% after implementation.

### **Immediate Feedback**

Scant research support or rejects the benefits of immediate feedback in accounting web-based tutorials (Attali, 2015). Feedback comes in a variety of forms. Sometimes feedback consists of revealing the answer, either including an explanation or merely giving the answer. Multiple-try feedback is another option where the learner is given the correct answer and then attempts the problem, or a similar problem. Some allow student to re-try multiple times with no feedback other than correct or incorrect. The majority of web-based tutorial programs for accounting allow a variety of options for feedback, which may be set-up by either the course developer or the instructor. Multiple choice and problem type, multiple step, problems may be assigned. The number of attempts prior to grading may also be altered ranging from one try to an infinite number of tries. Feedback

may consist of hints, walking students through similar problems (or the same problem and then assigning new numbers), or providing the answer and allowing students to solve an alternate problem for a grade. The feedback itself may be as simple as providing the answer or as complex as including the reasoning behind the answer.

The purpose of feedback is straightforward and includes helping students align expectations and performance as well as providing means for correcting mistakes and improving future performance. Often a student's perception of their understanding is inaccurate and does not match their current performance levels (Carter, Smith, & Ste-Marie, 2016). Additionally, feedback helps the student delve more deeply into the problems as they ascertain the most effective means for solving the questions. Feedback allows the student to judge their own level of understanding while also making them more aware of misconceptions (Attali, 2015). Feedback provides both positive affirmation and diagnostic information (Harrison, Konings, Molyneux, Schuwirth, Wass, & van der Vleuten, 2013). Additionally, constructive feedback may more actively engage the learner (Harrison, Konings, Molyneux, et al., 2013). It is possible that immediate feedback improves student persistence as well as course engagement (Sancho-Vinuesa, Escudero-Viladoms, & Masia, 2013).

Feedback results may differ depending on the delivery. Feedback may be either evaluative or comparative, and positive or negative. Overall, evaluative and positive feedback indicated the greatest likelihood of continued efforts and persistence (Burgers, Eden, van Engelenburg, & Buningh, 2015). Examples of evaluative feedback include descriptions of how to work the problem along with mini-lectures explaining the concepts. Comparative feedback merely indicates whether the response is correct or

incorrect by comparing the students' responses to the correct answer. Positive feedback maximizes the impact of selecting or calculating the correct answer. This type of feedback may increase both competence and autonomy, and as a byproduct, intrinsic motivation.

It is possible that the interaction between the students and the concepts increases both motivation and understanding. Studies conducted concerning online courses utilizing learning platforms that allow interaction and feedback found that the students had an overall positive opinion of the learning platform and the usefulness of the lecture notes and regular announcements. They also rated model answers, online chat and the bulletin board neutral, neither preferring nor rejecting them as useful to the learning process. It is possible that the ethnic backgrounds make a difference in students' perceptions. It was determined that students' interaction with the course content online was a significant factor contributing to overall student satisfaction (Basioudis & de Lange, 2009). The more methods employed to engage the students, the higher the students' success and motivation.

Studies also supported that efficient study time is more valuable as a predictor of success than the quantity of study time. Findings highlight that the consistently high performers tend to use a short average amount of time on homework and use a minimum number of attempts. When performance is likely to improve without any intervention, students are observed to use a long average time with still a minimum number of attempts. Intervention is necessary when a student demonstrates a pattern of short time with a high number of attempts. Web-based tutorials allow students to engage more efficiently in the course content (Bowen, Gulacar, & King, 2014).

Another study utilized a questionnaire to determine the perceived benefits of immediate feedback provided by online homework managers, such as online tutorials. An online questionnaire was used to query 75 engineering students enrolled in introductory classes. The questionnaire explored the students' impressions of online homework, lectures and academic integrity. The study determined that learning style influences students' preferences to online assignments versus in person classes as well as paper and pencil homework (Pundak, Shacham, & Herscovitz, 2013).

Another study investigates the effect of web-based problem solving on the learning environment, measured by both students' perceptions and academic performance. The course studied was an introduction to computers class at a university in Turkey. The computerized system focused on actual problem solving, where students used iterative functions and there was no one correct answer, rather than merely working assigned problems similar to what one might find in the textbook to reinforce specific content knowledge (Pundak, Shacham, & Herscovitz, 2013).

One factor, which separated this study from other similar studies, is the use of a control group. Seventy-five students were in each group; 150 students were involved in the study. This study incorporated the educational tool but did not change the delivery strategy, curriculum design or assessment practices. The web-based program was used as an alternative online teaching and assessment approach. The same instructor, using the same content delivery methods and assessments, taught all students. The experimental group also used the web-based program whereas the control group did not. The two groups achievement, social community perception, internet self-efficacy and self-regulated learning scores were compared. All participants were fully on-line students



taught in an asynchronous environment. Differences were measured by comparing pre- and post-test scores, the difference in achievement and average assignment scores, the difference in internet self-efficacy scores, the difference in self-efficacy scores for self-regulated learning, and the difference of the classroom community scores for experimental and control group students. The study revealed that problem based learning helps students feel more connected to their peers and motivated to learn the course content (Dincer, 2015).

Research indicates that students benefit from online, immediate feedback. For instance, one study evaluated data related to students' attitudes and practices when using online homework as opposed to paper-based homework. The data accumulated was then linked to the achievement of course outcomes. Relationships between student characteristics, study behaviors and perceived benefits of web-based homework were evaluated. The study included students in fourteen sections of seven economic courses offered at Labovitz School of Business and Economics at the University of Minnesota Duluth, within the Department of Economics, in the Fall of 2008. Each section used online homework, which was included in the student's course grade. Courses included both introductory and upper division economics courses taught by six different instructors.

Surveys were administered during the final two weeks of each course. Students were queried regarding attitudes about homework, perceptions of benefits in online homework, views of online homework as compared with paper based homework, as well as previous experience with online systems. Data including gender, course level and GPA were also collected. Two questions were addressed. First, whether students

benefited from online homework and, second, whether individual characteristics and behaviors influenced the perceived benefits of online homework. Findings supported that students found online homework beneficial in preparing for exams and understanding course material. Specifically, they appreciated the flexibility and immediate feedback (Doorn, Janseen, & O'Brien, 2010).

### **Research Findings of Subjective Measurements**

Both subjective and objective measures may be used to evaluate learning outcomes. Objective measures include grades, outcome assessment based on papers and problems worked, and other direct measures of the amount of technical knowledge gained in the course (Bowen, Gulacar, & King, 2014). Subjective measures included overall student satisfaction with the course, perceptions of their overall learning, students' perception of classmate and faculty interaction and comparison of satisfaction between online and onsite course delivery methods (Chen, Jones, & Moreland, 2010; Bowen, Gulacar, & King, 2014). Subjective measurements focused on how the students or faculty perceives the course.

Many researchers have taken the approach that if the students are satisfied they will work longer and more problems, thus performing more successfully. Studies evaluating the success of web-based tutorials often focus on overall satisfaction with the online delivery methods. The subjective analysis is divided into studies relating to faculty satisfaction and student satisfaction (Humphrey & Beard, 2014). Qualitative feedback is collected as well as quantitative analysis concerning student retention and completion rates (Khanlarian & Singh, 2014). For instance, a study conducted at the University of Granada during the first year of undergraduate classes included a total of

1128 students, organized into 17 groups during one academic year (2009-2010). Students were given the opportunity to voluntarily utilize computerized online learning activities in addition to other methods of study. The study found that the students who engaged in the online resources earned significantly higher final course grades. It was also noted that the time on task was not a determining factor; the grades earned were determining factors. Although the outcomes in this study are the student grades, the focus of the analysis is student motivation (López-Pérez, Pérez-López, Rodríguez-Ariza, & Argente-Linares, 2013).

Estimates reveal that approximately 25% of college students taking introductory accounting classes lack confidence in their ability to succeed (Sargent, Brthick, & Lederbert, 2011). The attractiveness of online homework and videos may motivate students to spend more time working problems than their counterparts in traditional courses not utilizing web-based tutorials (Richards-Babb, Drelick, Henry, & Robertson-Honecker, 2011). One dominant research focused on whether web-based tutorials motivate students to spend additional time working online homework, and whether their increased engagement increased motivation, and thus success (Basioudis & de Lange, 2009; Sowan & Idhail, 2014). The idea that there is a relationship between student satisfaction and achievement is the dominant focus of this subjective analysis (Sowan & Idhail, 2014). Some studies found only a tenuous quantitative performance advantage from utilizing web-based tutorials, while agreeing that qualitative measurements demonstrate that students liked the tutorials and, consequently, may have invested more time working problems (Hahn, Fairchild, & Dowis, 2013). These studies often made the assumption that if students liked the learning methods better, they would be motivated to

invest additional time and effort working problems, consequently improving the achievement of course outcomes (Lin, Wu, & Hsueh, 2011; King & Mo, 2013).

Universities, of course, are concerned with student retention and persistence. Introductory accounting classes are well known to be challenging and often more frustrating for entry-level students. Consequently, those classes are examined closely when looking for ways to improve student persistence (Sargent, Borthick, & Lederberg, 2011). The effectiveness of web-based tutorials has been studied from this perspective as well, seeking evidence that web-based tutorials might improve student retention and, as a by-product, the students' course performance. From this perspective, students' overall satisfaction and enjoyment of web-based tutorials has been evaluated (Sowan & Idhail, 2014).

Subjective methods of analysis have empirical basis stemming from the idea that the level of student motivation is predictive of students' performance and mastery ability (Sargent, Borthick, & Lederberg, 2011; King & Mo, 2013). In fact, low aptitude learners may elevate performance solely through increased motivation. Motivation may be a key factor in introductory accounting classes where some students are non-accounting majors and, consequently, have a lower interest in the technical skills required to be mastered in an introductory financial accounting class (Sargent, Borthnick, & Lederberg, 2011). Research supports that web-based tutorials provide the extra instruction, in a non-threatening and seemingly anonymous delivery format, enticing students to contribute the additional effort required to be more successful (Sargent, Borthick, & Lederberg, 2011; King & Mo, 2013). At the same time, the extra instruction, readily available online,

potentially improves the mastery level of all students (Sargent, Borthick, & Lederberg, 2011).

Ironically, these studies do not go as far as to measure the achievement of learning outcomes. Instead, they often measure other factors such as persistence, completion rates, and student satisfaction. Rather than measuring the difference between course final grades in courses utilizing web-based technology, the focus of analysis is shifted to students' perceptions of their learning (Cheng & Sanson, 2011). Students report that with web-based tutorials they often spend more time working on the homework problems (Allain & Williams, 2006; Kennelly, Cnidine, & Flannery, 2011). Although additional time spent on homework certainly seems to have a positive effect, it does not necessarily relate to increased final course grades.

### **Objective Measurements are Lacking**

Although both subjective and objective measurements are valuable considerations, ultimately the evaluation should determine whether a difference in the achievement of course outcomes exists between online accounting courses utilizing web-based tutorials and those courses not utilizing web-based tutorials. Relatively few studies focused on the achievement of learning outcomes as measured by exam scores, performance on comprehensive problems, differences between pre- and post-test scores, and final course grades (Morgan, 2013). Instead, most studies focus on students' perceived or expressed satisfaction with the online homework system (Baturay & Bay, 2010). Many researchers have taken the approach that if students are satisfied they will work longer and an increased number of problems, thus performing more successfully (Backhaults & Fisher, 2011; Basioudis & deLange, 2009; Blout & McNeill, 2011;

Bowan, Gulacar, & King, 2014; Folami & Simmons, 2012; Gulmez, & Kutluk, 2012; Hahn, Fairchild, & Dowis, 2013; Sargent, Borthick, & Lederberg, 2011). However, those same studies did not measure the achievement of learning outcomes. Although motivation is certainly a factor in persistence, which is a requirement for successful achievement of learning outcomes, it remains a critical question whether the use of web-based tutorials improves the achievement of learning outcomes.

Objective methods of analysis are most useful when they measure the difference between final course grades utilizing web-based technology versus those same courses not utilizing web-based tutorials. Studies addressing whether a specific link exists between the use of web-based tutorials in online accounting classes and the improved achievement of course outcomes yielded mixed results (King & Mo, 2013; Hahn, Fairchild, & Dowis, 2013; Humphrey & Beard, 2014). Prior research has resulted in mixed results because of the variety of pedagogy tested and the mix of outcomes measured (Chen, Jones, & Moreland, 2010; Lin, Wu, & Hsueh, 2014; Lopez-Perez, Perez-Lopez, Rodriguez-Ariza, & Argente-Linares, 2013; Zu & Jaggars, 2013). Technical fields, such as accounting, have benefited little from the limited research conducted (Chen, Jones, & Moreland, 2010). Further, the results from non-technical courses do not necessarily translate to accounting courses (Chen, Jones, & Moreland, 2010). The academic community should identify learning outcomes and pedagogy that are specific to accounting.

Most of the studies conducted are limited in scope, with few addressing full-length courses (Xu & Jaggars, 2013). Most studies have failed to consider the withdrawal rate and focused solely on the learning outcomes achieved by the students completing the

course (Xu & Jaggars, 2013). The studies conducted have revealed mixed results. Some studies demonstrate that students engaged in online, non-accounting, courses revealed an average 12% increase in outcomes for students using web-based tutorials compared with text-based learning methods (Cheng & Swanson, 2011). Similarly, students were shown to have a gain of one letter grade related to using web-based tutorials in an accounting class (Chen & Sanson, 2011). Students' active participation in online courses with web-based tutorials increased, leading to better achievement of learning outcomes (Basioudis & Lange, 2009; Folami & Simmons, 2012; Doorn, Janseen, & O'Brien, 2012).

As another example, a study at a Midwestern college examined the relationship between web-based learning and the achievement of learning outcomes in an online, college managerial accounting course. The students in this study utilized McGraw Hill's Connect web based learning platform for homework assignments. Two hypotheses were tested. First, students with better performance in the online homework would perform better in the course, overall. Second, students with better performance in Connect reading assignments would be better course performers.

The data for the study included students from a public university in the Midwestern area. All Bachelor of Science students were required to complete the managerial accounting class with a C or better. Five sections of managerial accounting were included. Students evaluated utilized Connect as well as the textbook entitled "Introduction to Managerial Accounting", 5<sup>th</sup> edition by Brewer, Garrison and Noreen. Course grades were based on attendance, assignments (Connect and paper based), and exams. The grading scales for the classes studied were not identical because the instructors made grade category adjustments based on individual pedagogical

preferences. The data was retrieved from two sources: data generated by Connect and the instructor's gradebooks.

The study findings indicated that the use of web-based learning tools was positively associated with both the overall course grade as well as every individual component of the grade structure. Additionally, better performance on Connect assignments motivated students to attend lectures and engage in the course. However, due to the variances between courses, one is challenged to determine whether the web-based tutorials were responsible for the higher levels of achievement.

Another study focused on the completion rates of students using web-based tutorials rather than the achievement of learning objectives. This study evaluated the impact of using MyAccountingLab, a web based tutorial, in principles of accounting classes. The study specifically quantified the difference between student persistence when using MyAccountingLab and when not using MyAccountingLab. One hundred twenty-four students out of 149 enrolled students completed the survey at the end of the first two semesters. Approximately 47% of the respondents were female and 53% were male. Twenty out of 124 were retaking the principles of accounting class. The survey was distributed during the last week of the semester.

Students' perceptions revealed that many students resisted the program in the beginning. Part of the reason for the resistance was the set-up required to get MyAccountingLab to run on individual computers. Secondly, the instructor established a much-regimented system of problems to work and many students resisted the regimented format, but not necessarily MyAccountingLab. Regardless of the challenges, 70% of the students surveyed believed that MyAccountingLab improved their performance in the



course, and 60% liked the resources and the fact that the program would take them to the textbook page to demonstrate the problems. Fifty-five percent of the students indicated that they had a better start on the reading and the material than if they had used the textbook only. Only 19% of the students indicated that they prefer an all manual semester, without MyAccountingLab. More importantly, student pass rates improved 12% from 72% to 84% (Lay, 2008).

One of the few studies which focused on the achievement of learning outcomes indicated positive results from the use of web based tutorials. This study examined the results of investigating the effect online homework tools had on student learning as compared with the more traditional instructor assigned and graded homework. The study was conducted over 3 semesters, fall 2007, spring 2008, and fall 2008. Seven sections of principles of microeconomics, taught by a single professor, were included. In fall 2007, traditional instructor assigned and graded homework was used. In the spring 2008 and fall 2008 online homework was used. Over the three semesters, 171 students participated in the study. Seventy-seven students used traditional homework and 94 used online homework. Pre- and post-tests were used in all sections. Average scores were compared and it was found that students using online homework had scores that improved an excess of 5.35 to 5.48 points. The results indicated that both types of homework produced similar improvement.

Next, an unpaired t-test was used to compare the homework formats. These results also failed to show significant differences between results achieved in the different formats. Finally, ordinary least squares regression analysis was used. The effect of students with higher grades was eliminated from the analysis. Here, results showed that

students who earned an A or B in the course benefited significantly from online homework (Lee, Courtney, & Balassi, (n.d.).

Studies conducted in other technical fields demonstrated that students utilizing web-based homework improved learning outcomes. Studies focusing on organic chemistry and mathematics showed learning improvements attributed to the use of web-based online homework systems (Richards-Babb, Drelick, Henry, & Robertson-Honecker). Additionally, studies focused on pharmaceutical courses and anatomy revealed a possible positive relationship between the use of web-based tutorials and elevated academic achievement (Carleton, 2012; Dincer, 2013; Sowan & Idhail, 2014). However, the results from studies outside of accounting are not necessarily predictive of similar results in accounting courses.

For example, a study conducted with chemistry classes to determine if the online homework improved students' performance and to assess students' perceptions concerning online homework revealed promising result. In this study, course quizzes were replaced by online homework. WileyPLUS was used for the online homework form the fall of 2006 to the fall of 2008. Data was gathered in a couple ways. Information concerning success rates in the chemistry classes was obtained through the school's database. The letter grades earned in the course defined success rates. Instructor records provided information correlating quiz and homework averages, exam averages, final exam scores and final numerical grades. An attitudinal online homework survey was used consisting of 36 questions. A 5-point Likert scale was used to assess the extent of agreement for each of the 36 statements. The survey was distributed during the last week of lectures. Two hundred twenty-six students were surveyed and 180 returned the

survey. Two correlational analyses were performed. Quiz averages were compared against exam average, final exam score, final numerical grade and class grade.

Alternatively, homework averages were compared against the same criteria. It is noted that the average success rate after implementing online homework improved by 3.7%, then 9.9% and finally 7.9% (Richard-Babb, Drelick, Henry, & Robertson-Honecker, 2011).

### **Impact of Course Level**

Another area of insignificant research is whether controlling for course level produces any difference in final course grades between accounting classes utilizing web-based technology versus those not utilizing web-based technology. For example, would the use of web-based tutorials have a similar or different effect on the achievement of learning outcomes for an introductory financial accounting class versus a higher level intermediate accounting II class? Exploring this question is substantial for two reasons. First, accounting is a challenging, quantitatively oriented course and the concepts may be more difficult to master when first introduced. Once the basics are learned, the process may become easier. Second, there may be learning and study habit differences between the typical freshman student versus a sophomore, junior or senior.

Financial and managerial accounting are required courses for both students concentrating in accounting as well as those students who are majoring in other business concentrations such as general business, marketing or human resources. The typical business student often finds accounting intimidating because of its quantitative focus (King & Mo, 2013). In fact, even intermediate accounting I, required for all accounting and finance majors, typically results in a 50% or more failure rate (Sargent, 2013).

Financial and managerial accounting are unlike most courses taken by college business students, and are often compared to learning a new language, the language of business. Significant practice is necessary to master the concepts (Khanlarian & Singh, 2014; King & Mo, 2013). The courses require more time and problem solving than previous courses, resulting in higher failure rates and lack of completion (King & M, 2013).

Financial and managerial accounting also has larger class sizes and additional sections running because of the mixed enrollment. Faculty spends a significant amount of time grading homework (Pundak, Shacham, & Herscovitz, 2013; Mulig & Rhame, 2012). At the same time, homework is a critical component of student success. Test scores for students who successfully complete homework is significantly higher than for those who do not (Titard, DeFranceschi, & Knight, 2014). Time constraints prevent assigning and grading a sufficient number of problems for student mastery (King & Mo, 2013).

Additionally, paper-based homework does not allow for immediate feedback. Students in financial and managerial accounting may benefit from working additional assigned problems, receiving immediate feedback and having access to optional problems to reinforce their learning. Web-based technology provides immediate feedback as well as the options for pre-tests, post-tests and additional problems with feedback. Students in introductory accounting classes most likely benefit from additional practice with the concepts (Titard, DeFranceschi, & Knight, 2014; Fajardo, 2014). The question remains whether beginning college students will benefit any differently from web-based tutorials than would higher level students.

Beginning students have life adjustments they must make, in addition to the acquisition of study habits and often remediation for gaps in prerequisite knowledge (Sargent, 2013). Freshmen students' persistence and retention is a common problem in many universities. Student persistence is an even larger challenge for online programs (Varner, 2013). Challenges for entering students reaches beyond academics. Persistence looks at overcoming both academic and non-academic barriers (Varner, 2013). Time management is a critical factor for student success (Varner, 2013). Web-based tutorials potentially assist with time management by tracking time-on-task and mapping out a program for homework study and student success. The immediate feedback may help students use time more efficiently. The demonstration problems and brief videos likely enhance learning (Doorn, Janssen, O'Brien, 2010; Chen & Swanson, 2011). Combined, students using web-based tutorials have access to resources that may enhance their academic success.

Typically, most universities are primarily concerned with success and completion rates in lower level accounting course because these courses are challenging and often the point where unprepared students drop out of academics. Consequently, an immediate concern is student persistence and success in entry level accounting classes (Fajardo, 2014). Once students overcome the challenges associated with successfully navigating freshman courses and re-arranging priorities and lifestyles to provide the time to be successful in college, many of the persistence concerns move from the forefront of concerns, fading into the background as less urgent. The current void in investigation makes it more important than ever to evaluate whether, when controlling for course level, there is a difference in final course grades when utilizing web-based tutorials versus not

using web-based tutorials. In other words, does the use of web-based tutorials result in a difference in final course grades, and does that difference vary between course levels?

### **Impact of Academic Concentration**

An additional question of interest is whether, when controlling for academic concentration, what is the difference, if any, between final courses grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials? Understanding the impact of academic concentration is significant for two reasons. First, in lower level classes there is typically a mix of students concentrating in accounting as well as general business students. The general business students are engaged in concentrations such as general business, marketing or human resources. Often students not concentrating in accounting approach accounting courses with apprehension and less desire to learn the challenging concepts. At the same time, motivation and effort significantly influence the achievement of mastering learning outcomes (Maksy, 2012). A question worthy of study is whether web-based tutorials enhance the achievement of all students equally.

One of the most challenging factors affecting the development, delivery and success of financial accounting classes is the disparity of students taking the courses. Some students enrolled in an accounting concentration view this course as the first significant step toward the rest of their accounting education. Other students are enrolled in the program as business students who will take, at the most, only one additional accounting course. The latter students may be less engaged and less motivated (Cheng & Swanson, 2011). Few studies address these learners and none have been identified, which address whether, when controlling for academic concentration, there is a

difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.

Students enrolled in upper level accounting courses, such as intermediate accounting II, have already overcome the hurdles associated with early accounting courses. Students who previously performed unsuccessfully in accounting are no longer enrolled in accounting classes, having moved on in their degree program or changed their concentration. Presumably, the remaining students are committed and highly motivated to achieve their ultimate goal, graduation and passage of the CPA exam (Maksy, 2012). The change in student population in higher level accounting courses may change the results of web-based tutorials on learning outcomes.

Additionally, academic success in higher level accounting classes may well rest with the achievement of learning outcomes in lower level accounting courses (Sargent, 2013). Web-based tutorials would allow remediation for higher level accounting students needing to review lower or reinforce lower level accounting concepts. Students would likely remain more engaged using online videos and homework as well as benefit from the immediate feedback similar to students enrolled in the lower level financial accounting courses. Exploring whether academic concentration affects the achievement of learning outcomes when using web-based tutorials is worthy of additional investigation.

A study, which attempted to identify factors that have a significant effect on student performance when using web based homework, and then to test the significance of relationships between the revealed factors, was conducted in 2014. Specifically, the researcher studied the impact of web based homework on student motivation and

frustration over the course of a semester. The researcher identified twelve constructs: cooperative learning, engagement, lazy user, locus of control, mastery goals, perceived ability, performance goals, self-efficacy, technical efficacy, usefulness, and user frustration.

Data was collected from four accounting classes at a large regional university: two principles I classes, and one each of principles II and intermediate I. One class was comprised of only accounting majors and another entirely online class was comprised of entirely non-accounting majors. The final two classes were a mix of accounting and non-accounting majors. Three hundred sixty-eight students were surveyed at three points in the semester: after two weeks, at mid-terms, and a week before final exams. A standard 5-point Likert scale was used ranging from “strongly agree” to “strongly disagree”.

Statistical analysis included conducting reliability tests to determine that the theory-based constructs are appropriate for analyzing the relationships in the structural model. Cronbach’s alpha was used to check for internal consistency. The higher the score, the more related the items are. Cronbach’s alpha must be 0.6 or higher in exploratory studies such as this, and the measure in this study ranged from 0.813 and 0.905 for the three tested periods.

Results of the study indicate that frustration with technology affect student motivation and performance in online classes with web-based homework, but that the barriers to success decrease with time spent using the software. Practical applications from this study include the benefit of practice homework and better guidance to students where IT is concerned. For instance, practice assignments could be used that are not graded and offer full feedback.



Drawbacks in this study are notable. Classes comprised of all accounting majors are considerably different from those comprised of a mix or no accounting majors. Accounting courses are often intimidating in themselves to students, regardless of the technology or lack of technology. A larger sample should be used with possible blocking for the course make-up. It might be helpful to separate results of accounting majors from non-accounting majors (Khanlarian & Singh, 2014).

### **Obstacles to Evaluation**

Several obstacles are faced in conducting a comparative evaluation of either subjective or objective measures. There are intrinsic differences between courses that go beyond delivery methods and which may have a similar impact on all measurable outcomes (Lee, Courtney, & Balassi, n.d.). Faculty members' impact on both student satisfaction and learning outcomes may outweigh the influence of the delivery method. Most studies previously conducted are small scale, involving one university and often one course (Chen, Jones, & Morelenad, 2012). Consequently, the results of many existing studies are difficult to extrapolate (Glumez & Jutluk, 2012). Further study addressing the question of how the achievement of learning outcomes can be improved in online accounting classes is critical for the development of courses, which will meet the rapidly changing and expanding industry demands. Well-educated and independent thinking, problem solving employees are key to companies' survival in the global market (Donmez, Erdogan, Kutluk, & Utku, 2012; Lay, 2008). Business, and the accounting industry, is undergoing significant change (Crespi & Julesza, 2013).

### **Summary**

Today's accountant must be proficient in the online environment. Today's universities must produce employees equipped to excel in this new business world. Understanding what online pedagogy is the most effective for online accounting courses, demonstrated through the achievement of learning outcomes, is necessary because universities must produce students equipped to meet the current business needs, they must also prepare graduates to pass the certified public accounting exam (Donwa & Garuba, 2011). Without strong technical knowledge, neither goal is attainable.

The problem being studied is whether the use of web-based tutorials in online accounting classes increases the achievement of learning outcomes as evidenced by final course grades. The mitigating factor considered is the impact of academic course level. Additionally, the impact, if any, of web-based tutorials on student satisfaction is evaluated. Research included in this study will add to the scholarly literature of effective online pedagogy. It will contribute to understanding how to provide an optimal learning environment for online students taking accounting classes.

### Chapter 3: Research Method

As online education continues to expand, appropriate pedagogy is critical to the success of producing well-rounded accountants prepared to enter the growing, challenging, global workforce. The specific problem of interest is that the academic impact of the usage of web-based tutorials' effect on student satisfaction and the achievement of learning outcomes in online accounting courses is not currently well understood. The purpose of this quantitative, non-experimental, correlational study was to determine whether web-based tutorials affected student satisfaction or the achievement of learning outcomes in online accounting courses, and whether moderating for course level affected any such relationship.

This chapter explores and justifies the research method and design chosen and discusses both the population targeted as well as the sample used to represent the population. The specific instruments used for evaluation are explained, as well as the operational definitions of the variables. The method of data collection, processing and analysis is discussed in detail. Finally, this section elaborates on the assumptions, limitations, and ethical assurances.

The research questions and hypothesis evaluated are as follows:

**Q1:** What is the difference, if any, between final course grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials?

**Q2:** Does course level moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses?

**Q3:** What is the difference, if any, between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials?

The three hypotheses being tested are:

- H1<sub>0</sub>:** There is no difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials.
- H1<sub>a</sub>:** There is a difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials.
- H2<sub>0</sub>:** Course level does not moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses.
- H2<sub>a</sub>:** Course level does moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses.
- H3<sub>0</sub>:** There is no difference between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.
- H3<sub>a</sub>:** There is a difference between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.

### **Research Methods and Design**

The purpose of this quantitative, non-experimental, correlational study was to determine whether web-based tutorials affected the achievement of student satisfaction or

learning outcomes in online accounting courses, and whether moderating for course level affects any such relationship. This quantitative research method strived to be purely objective in its evaluation (Leedy & Ormond, 2013). A quantitative study of the correlation between web-based tutorials on student satisfaction and the achievement of learning outcomes in online accounting courses is an excellent beginning to understanding the effect of this pedagogy. A correlational study was used to quantify the relationship between web-based tutorials in online accounting and both student satisfaction and the achievement of learning outcomes. A non-experimental, correlational research design was appropriate for this study as this type of design allows for tests for associations between variables. It was a predictive study because, as observers, one lacks control over variables. This type of study was not designed to determine causality, but merely to identify the existence and strength of any relationships between variables (Leedy & Ormrod, 2013).

T-tests were performed to determine any differences in mean final course GPA between groups utilizing the web-based tutorials versus those not utilizing the web-based tutorials. T-tests were also performed to determine any difference in student course satisfaction between groups utilizing the web-based tutorials versus those not utilizing the web-based tutorials. A t-test is used when the population standard deviation is unknown and the population is normally distributed, or if the population standard deviation is not known and the sample size is greater than 30. The t-test allows for greater variability than the standard normal distributions but is similar in symmetry (Jackson, 2012).

## **Population**

The study population was comprised of archived data from online undergraduate financial accounting and intermediate I, II and III accounting courses for students who attended or are currently attending National University. One portion of the population represented student satisfaction and final course GPA for students taking online accounting courses utilizing web-based tutorials and the other portion of the population included online students' satisfaction and final course GPA for course sections, which did not utilize web-based tutorials. Finally, lower level accounting courses were separated from higher level accounting courses to determine if course level had a moderating effect on the final course GPA.

## **Sample**

The sample was based on archival data collected by National University. This sample was selected due to the convenience and appropriateness of the data. The data included final course GPA for all sections of financial accounting and intermediate I, II, and III for the periods beginning March 1, 2015 and ending June 30, 2016. Based on a power analysis via G\*Power, utilizing a t-test, with a small effect size ( $f^2$ ) = .10 at 80% power and a probability level ( $\alpha$  level) of  $p < .05$ , the minimum required sample size for this study will be 85 per group (Tomczak, Tomczak, Kleka, & Lew, 2014). The collection period was sufficient to meet the minimum required sample size because courses at National University were each 4 weeks in duration.

## **Materials/Instruments**

The archived data was collected from the University's database of final course GPA, by course section, and was provided without personal student identification

information. Four pieces of information were critical to this study: final course GPA, course taken, student satisfaction score, and whether the course included the use of web-based tutorials. The final course GPA student satisfaction score and course taken were collected by National University's analytics department. The answer to whether the course utilized web-based tutorials was provided by the Accounting Chair, based on the course section information. This data was not a part of the students' records but was readily available and was offered by the Accounting Department Chair.

All data provided was electronic and all student identification was removed prior to transmittal. Students had no knowledge that their course grades were being used for this study, nor were they aware that a study would be conducted. The students involved chose to enroll in the accounting courses as partial fulfillment of their academic program but had no choice whether the course taken utilized web-based technology. The option for web-based technology was not available prior to November 2015, as no courses utilized web-based tutorials prior to that date. After web-based tutorials were integrated into the courses, all enrolled student were required to utilize the web-based tutorials as part of their course requirements

The structure and grading scales of the courses, both with and without the web-based tutorials, were identical. The grades in each course consisted of standardized weekly quizzes and a standard departmentalized final exam. The homework given for each course was identical. Although different instructors taught a variety of course sections, all instructors followed the same course syllabus, course outline, assigned identical homework and include identical quizzes and final exams. Additionally, all instructors followed the same grading scale.

## Operational Definition of Variables

The primary constructs of this study were the independent variable of the usage of web-based tutorials and the dependent variables of student satisfaction and final course GPA, controlling for course level. Nominal scales were used to measure the usage of web-based tutorials, course level and academic concentration. An ordinal scale was used to measure final course GPA and student satisfaction. All tests were focused on the differences in final course GPA or student satisfaction scores. T-tests were appropriate for analyzing differences between averages (Tomczak, Tomczak, Kleka, & Lew, 2014). Applicable operational definitions are as follows:

**Usage of web-based tutorials.** Web-based tutorials are programs that may accompany online courses, which allow homework to be worked online, with immediate feedback, and incorporate videos, demonstration problems and options for self-tests. Web-based tutorials were coded as either 1 – used, or 0 – not used. The use of web-based tutorials was the independent variable. For the purposes of this research, web-based tutorials included the use of MyBusinessCourse for financial accounting and Wiley Plus for intermediate accounting I, II and III.

**Final Course GPA.** The final course GPA was the aggregate final GPA average of the identified class. The final course GPA was measured on a scale of 0 – 4 and was comprised of homework (20 %), quizzes (30%), live lecture attendance (10%), online discussions (10%) and a comprehensive final exam (30). The final course GPA was tested to determine if there were any differences in average final course GPA when utilizing web-based tutorials in the course.

**Course Level.** Final course grades from two groups of courses were tested:



financial accounting and intermediate accounting I, II, and III. Financial accounting is an entry level accounting class taken at the freshmen level. Intermediate accounting is an accounting course taken later in the accounting program after the basics have already been taught. The differences between financial accounting and intermediate accounting were used to determine if learning outcomes varied between lower level and upper level accounting courses.

**Student Satisfaction.** Student satisfaction was measured for each course using student responses to the end-of-course evaluations. The student satisfaction scores were recorded using a scale of 0 – 5, with zero being the least satisfied and 5 being the most satisfied.

#### **Data Collection, Processing, and Analysis**

The audit trail was provided by assurances from the university's reporting process. The raw data was compiled into an Excel spreadsheet and transmitted electronically for analysis. The data was processed by the university's analytic's department. The learning management system contained numerical end-of-course grades as well as student satisfactions scores. The university's analytics department removed identifying information and prepared a report including end-of- course GPA scores and student satisfaction scores as well as the course code, name and whether web-based tutorials was utilized. Data was input into Minitab, a statistical software program.

Independent t-tests were performed for each question. Independent t-test compared the difference between final course grades for multiple course sections of online financial accounting and intermediate I, intermediate II and intermediate III utilizing web-based tutorials versus those not utilizing web-based tutorials. Two

additional questions were being addressed. First, whether the utilization of web-based tutorials affected final course grades differently in lower versus higher level accounting classes. The research analyzed whether course level moderated the relationship between utilization of web-based tutorials and final course grades in online accounting courses. The third question asked whether the utilization of web-based tutorials affected student satisfaction in online accounting courses. Two one-way randomized ANOVAs were used to compare the means of the three groups and to estimate error rates. A within-groups variance was conducted to estimate the population error variance and a between-groups variance was used to estimate the effect of the independent variable and error variance.

### **Assumptions**

It was assumed that the participants in the study would be sufficiently diverse as to represent the population of students enrolled in the accounting and business concentrations at National University. Additionally, it was assumed that the population would be sufficient in size and scope, and the student diversity broad enough, that the population would be potentially representative of learners at similar institutions of higher education. It was reasonably assumed that all enrolled students met the criteria for course enrollment and that all faculties met or exceeded minimum qualifications for teaching at National University. One also assumed that all courses utilized the same University established grading scale and calculated final grades without manipulation due to grading curves. Lastly, it was assumed that the assignments utilized in the web-based tutorials, as well as the course quizzes and exams, were not altered by instructors teaching the course, but rather represent the content as established by National University.

Internal validity was maximized by assuring all courses were consistent in their design, both in content as well as delivery method. The assignments and the exams were identical for each section of the same course. Similar homework was assigned, using the web-based tutorials, as was assigned in the courses without web-based tutorials. The homework was identical in concept, with different numbers in the calculations. Web-based tutorials allowed for selections of problems, which were similar to textbook problems. The similar feature assures the concept and the work was identical while different students had different numbers. Assigning the same homework helped assure that differences between final course grades were based on the web-based technology rather than changes in course content.

### **Limitations**

The study had several limitations. Final course grades may not have revealed results specifically related to the effectiveness of web-based tutorials because the final course grades were additionally influenced by individual student effort, time invested in the course, and previous accounting experience. Some variance in final course grades may have been due to differences between individual students and cohorts of students. Even the time of year enrolled in the course may have impacted final scores. For example, students taking the course over the summer months may have been impacted by additional responsibilities because children are out of school for the summer, increasing family responsibilities.

Although the original courses were identical, instructors were welcome and encouraged to add value based material to their individual sections. Some added videos and posted helpful articles and information to assist students in understanding the course

concepts. Others add few additional resources. The study had no controls to differentiate between content added by individual instructors or to control for consistency between courses beyond the original sections as developed and deployed by the University.

Additionally, instructor interaction varied between sections. Some instructors were consistently present in their courses and interacted significantly with the students throughout the week in both discussions and course announcements. Other instructors interacted at a minimum level. Although faculty were encouraged to engage the students often and constructively throughout the week, some faculty contributed significantly to the students in the discussions and course announcements, whereas others would only meet minimum participation standards. Faculty involvement most likely had an impact on student achievement of learning outcomes.

Faculty lectured in a synchronous online format. The university requires that faculty lecture for two hour blocks, twice a week. The lectures are recorded. However, some faculty lectured when students were most available to attend while other lectured when fewer students were able to attend and instead the recorded lecture was reviewed. The quality and quantity of lectures varied between individual faculty members. These differences may have impacted final course grades.

Students invested different amounts of time and effort in each course. Obviously the time invested by individual students had an impact on their individual achievement of learning outcomes. Also, the quality of time invested varied between students. There is no measure or control for the amount of time students spent engaged in learning activities. Disparity between time and effort invested by individual learners may have affected the achievement of learning outcomes.

Student satisfaction may be influenced by factors other than the use of web-based tutorials in the online classes. National University instructors lecture synchronously for at least 4 hours each week, and also interact with students during office hours. Student satisfaction may be influenced by the relationship with the instructor or the student's individual learning style as related to both the course and the instructor's teaching style. Also, outside influences and stresses may affect student satisfaction. It is not possible to control all variables that might have affected student satisfaction or course grades.

### **Delimitations**

The current study focused specifically on undergraduate students enrolled in business concentrations. All students were enrolled in online accounting courses, although some students might have also taken courses at brick-and-mortar institutions at the same time. All students were enrolled at National University, a private university headquartered in California. All students had met all prerequisites for the courses taken. Each section in the sample groups was comprised of a similarly mixed population of students in regards to age, nationality, residence location, and prior education. Additionally, the majority of students in this population were employed. At the same time, potential differences may have existed in prior academic or professional accounting experience; time divided between course work, children and employment; online course experience; and time invested in the course.

### **Ethical Assurances**

This study involved archived data of students' course grades, satisfaction level, course section, and academic concentration. All data collected was historical and maintained by the university's registrar's office. No specifically identified student data

was collected. Additionally, no live participants were studied. The study did not involve surveys, pre- or post-tests, or the collection of data on students enrolled in future accounting classes.

The study met the ethical considerations of university policy and did not require an informed consent release from students. All released data was anonymous. No specific student identification was released. No releases were requested from the students because no personal data was identified. The data collected contained the final numerical course GPA, the student satisfaction score, the name and identifying course number of each course taken and whether the course utilized web-based tutorials. Both National University and Northcentral University granted IRB approval (Appendix 1 and 2)

### **Summary**

The purpose of this study was to determine if there was a significant difference between student satisfaction and the achievement of learning outcomes in undergraduate online financial and intermediate accounting classes when web-based tutorials are included. Additionally, differences between students' performance when enrolled in a lower level accounting course versus a higher level accounting course was evaluated. The questions answered included: What is the difference, if any, between final course grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials? Moderating for course level, what is the difference, if any, between final course grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials? What is the difference, if any, between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials?

The study of accounting is challenging. Determining the most efficient and effective way to help students achieve the course learning outcomes benefits both the accounting industry and academics. Evaluating the impact web-based tutorials has on the achievement of learning outcomes provides significant pedagogical strategy for universities tasked with educating future accountants. Understanding the potential effect of web-based tutorials on student satisfaction allows for greater insight into maintaining student motivation and persistence. Student persistence is critical for the success of any academic program.

## Chapter 4: Findings

The purpose of this study was to determine if utilizing web-based tutorials in online accounting courses had a significant impact on student satisfaction and the achievement of learning outcomes, as measured by course student satisfaction scores and course GPA. Analysis was conducted to answer three questions, using related hypothesis. The data were analyzed utilizing Minitab, statistical software. The standard used to evaluate the data was statistical significance at the 0.05 alpha level of significance. Data analysis began by using multiple t-tests to investigate differences in the means between the independent variable (usage of web-based tutorials) and the dependent variables: student satisfaction or course GPA. An independent t-test was conducted to answer each research question. This chapter explains the findings, arranged in research question order.

### Results

Descriptive statistics were calculated, including the minimum, maximum and mean GPA and the standard deviation for all courses which included web-based tutorials and those courses that did not include web-based tutorials.

Table 1: Descriptive Statistics: Course GPA

Variable	Minimum	Maximum	Mean	SD
No web-based tutorials	2.4790	3.5290	2.998	0.2860
Web-based tutorials	2.5830	3.7830	3.005	0.3230



Descriptive statistics were also calculated, including minimum, maximum and mean satisfaction score and standard deviation for all courses utilizing web-based tutorials and not utilizing web-based tutorials.

Table 2: Descriptive Statistics: Course Satisfaction

Mean satisfaction score				
Variable	Minimum	Maximum	Mean	SD
No web-based tutorials	4.10	4.73	4.52	0.2185
Web-based tutorials	4.40	5.00	4.60	0.2207

Independent-samples t-tests were used to determine if a statistically significant difference existed between the mean GPA for students who took online accounting courses using web-based tutorials versus students who took online accounting courses not using web-based tutorials. T-tests were also conducted to determine whether course level had a moderating effect on the relationship between utilization of web-based tutorials and final course grades in online accounting courses. Additionally, t-tests were used to determine if a statistically significant difference exists between student satisfactions in online accounting courses utilizing web-based tutorials versus those courses not utilizing web-based tutorials.

Meeting six assumptions is necessary for utilizing independent t-tests. First, there must be a continuous dependent variable. The sample meets this test because the one continuous dependent variable is the students' GPA. Second, the independent variable is categorical with two groups. The data meets this assumption. The independent variable is the inclusion of web-based tutorials in the online accounting class versus courses taken without the usage of a web-based tutorial. The third assumption is that there was

independence of observations. The data was collected from courses completed, some which included web-based tutorials and other courses which did not include web-based tutorials.

The fourth assumption is that there were not significant outliers in the measured groups. Box plots were prepared to determine that there were no outliers for either group of data. Based on the box-plot analysis, no outliers were present in either group of data (Figures 2, 3, 4, and 5). The fifth assumption is that the data is normally distributed. The data was tested using the Anderson-Darling normality test (Figures 6, 7, 8, and 9). Using this test, a p value less than 0.05 demonstrates that the data is not normally distributed and a p value greater than or equal to 0.05 suggests that the data is normally distributed. All data sets, except for the student satisfaction scores for courses not utilizing the web-based tutorials are normally distributed. The p-value for the GPA in courses not utilizing web-based tutorials was 0.698 and the p-value for the GPA in courses utilizing web-based tutorials was 0.463. The p-value for the student satisfaction in courses not utilizing web-based tutorials was 0.015 and the p-value for student satisfaction in courses using web-based tutorials was 0.303. Normal distribution for student satisfaction in courses not utilizing web-based tutorials is not critical because the sample size is sufficiently large to generate accurate results, within a 95% confidence level.

The sixth assumption was that there is homogeneity of variances. Sample sizes are relatively similar across all comparisons. Both Bonnett's and Levene's tests for homogeneity were conducted. For each test, a p value greater than or equal to 0.05 indicates that homogeneity exists in the data. For the GPAs with and without the use of web-based tutorials, Bonnett's test revealed a p value of 0.636 and Levene's test revealed

a p value of 0.895 (Figure 10). Bonnett's and Levene's tests related to student satisfaction revealed p-values of 0.188 and 0.120 (Figure 11). Both tests indicate homogeneity of variances. Given that the data has met all six requirements for using t-tests to determine if there is a significant difference in mean GPAs for students in courses utilizing web-based tutorials versus those not utilizing web-based tutorials, t-tests are an appropriate statistical analysis tool. Separate t-tests were conducted to answer each research question.

### **Effect of Web-Based Tutorials on Learning Outcomes**

The first research question focused on the overall effect on learning outcomes, measured by course GPA, when web-based tutorials are utilized in online accounting courses. An independent t-test, with an alpha value of 0.05, was conducted to test for differences in mean GPAs for the two groups: online accounting courses utilizing web-based tutorials and those not utilizing web-based tutorials. The data was evaluated to answer the following question and hypotheses.

**Q1:** What is the difference, if any, between final course grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials?

**H1<sub>o</sub>:** There is no difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials.

**H1<sub>a</sub>:** There is a difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials.

The mean class GPA for students enrolled in online accounting courses not utilizing web-based tutorials was 2.999 on a scale of 0 – 4. The mean class GPA for students taking online accounting classes which included web-based tutorials was 3.050 (Table 3). The difference between the GPAs demonstrates that courses which utilized web-based tutorials produced a slightly higher mean class GPA. However, the difference is not statistically significant. The p-value for the comparison of all included online accounting courses utilizing web-based tutorials versus those not utilizing web-based tutorials is 0.615 (Table 3).

Table 3: Independent t-test comparing all online accounting courses

	Mean	St. Dev.	SE Mean
No web-based tutorials	2.999	0.286	0.066
Web-based tutorials	3.050	0.338	0.078
Difference	-0.051	-0.052	-0.012
Confidence interval	95%	(-0.258, 0.155)	
P-value	0.615		
DF	35		

The p value is used to determine statistical significance. A p value equal to or less than the alpha 0.05 is necessary to equate statistical significance. The p value for this test is not less than the alpha, indicating one should fail to reject the null hypotheses. It must be concluded that there is no difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials. The answer to the first research question is that there is no statistically significant difference between final course grades in online accounting

courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.

### **Course Level and Effectiveness of Web-Based Tutorials**

The second question explored whether course level moderated the effectiveness of web-based tutorials on the achievement of learning outcomes. Courses were divided into two levels. The lower level course included financial accounting and the upper level courses included intermediate accounting I, II, and III. The question and related hypotheses are as follows:

**Q2:** Does course level moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses?

**H2<sub>o</sub>:** Course level does not moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses.

**H2<sub>a</sub>:** Course level does moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses.

Lower level courses showed a small increase in mean class GPA when utilizing web-based tutorials. The mean class GPA when tutorials were not used was 2.976, whereas the mean class GPA when tutorials were utilized was 3.217 (Table 4) The mean class GPA for lower level courses utilizing web-based tutorials was 0.241 points higher than lower level courses, which did not include web-based tutorials. Interestingly, the mean class GPA for upper level online accounting courses, which did not utilize web-based tutorials, was slightly higher by a difference of 0.080 points. The mean class GPA for these classes using web-based tutorials was 2.929, whereas the class GPA for upper level classes not utilizing web-based tutorials was 3.009.

Table 4: Independent t-test comparing lower level online accounting courses

	Mean	St. Dev.	SE Mean
No web-based tutorials	2.976	0.375	0.150
Web-based tutorials	3.217	0.390	0.190
Difference	-0.241	0.015	-0.040
Confidence interval	95% (-0.848, 0.365)		
P-value	0.367		
DF	6		

Table 5: Independent t-test comparing upper level online accounting courses

	Mean	St. Dev.	SE Mean
No web-based tutorials	3.009	0.252	0.070
Web-based tutorials	2.929	0.276	0.083
Difference	0.080	-0.024	-0.013
Confidence interval	95% (-0.146, 0.307)		
P-value	0.468		
DF	20		

Using an alpha value of 0.05, the p-value for the difference in GPAs in lower level courses utilizing web-based tutorials versus those courses not utilizing web-based tutorials is  $p=0.367$  (Table 4). Similarly, the p value for the difference in GPA in upper level online accounting courses utilizing web-based tutorials versus those courses not utilizing web-based tutorials is  $p=0.468$  (Table 5). Any p value less than or equal to the alpha value of 0.05 indicates that the null hypothesis should be rejected. Both p values exceed the alpha; the null hypothesis should fail to be rejected. The conclusion is therefore that course level does not moderate the relationship between utilization of web-based tutorials and final course grades in online accounting courses.

### Web-based tutorials and Student Satisfaction

The third question concerns student satisfaction in online accounting courses.

The final question and hypotheses are as follows:

**Q3:** What is the difference, if any, between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials?

**H3<sub>o</sub>:** There is no difference between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.

**H3<sub>a</sub>:** There is a difference between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.

Course satisfaction was expressed on a scale ranging from 0 – 5, as indicated by students on the end-of-course surveys. The mean satisfaction score for students in courses not utilizing the web-based tutorials was 4.416. The mean satisfaction score for students in courses using web-based tutorials was 0.206 points higher, at 4.622 (Table 6).

Table 6: Independent t-test comparing student satisfaction

	Mean	St. Dev.	SE Mean
No web-based tutorials	4.416	0.381	0.088
Web-based tutorials	4.622	0.331	0.085
Difference	-0.206	0.050	0.003
Confidence interval	95%	(-0.456, 0.043)	
P-value	0.102		
DF	31		

Once again, the p values exceeded the alpha value of 0.05. The difference between the two satisfaction scores was not statistically significant. There is no statistically significant difference between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.

### **Evaluation of Findings**

The findings of this analysis are not wholly supported by previously identified literature. Several studies evaluated the effectiveness of web-based tutorials on student satisfaction and the achievement of learning outcomes, finding that either components of web-based tutorials, or full implementation of web-based tutorials, improved student satisfaction or the achievement of learning outcomes. For example, web-based tutorials include mini-video clips and the option to include checks for understanding. One study concluded that students utilizing online videos and mini-quizzes and checks for understanding scored 88% on exams, whereas students who did not utilize the mini-videos and checks for understanding scored only 66% (Schacter & Szpunar, 2015).

Additionally, previous studies have demonstrated that online tutorial use improves exam scores. A study conducted at a southwest university in the Spring of 2010, included a hybrid and a control group. The control group learned from text-based lectures and the treatment group enjoyed multi-media based learning modules. A t-test conducted demonstrated that the outcomes of students utilizing multi-media performed better than those in the lecture group. The students using multi-media earned an average of one letter grade higher than the students learning from text-based lectures only (Cheng & Swanson, 2011).



Previous studies have also shown that both student persistence and grades are higher in classes utilizing web-based tutorials and that overall grades improve. A study conducted in the Spring of 2007, involving all sections of principles of accounting II at a large urban public university with a diverse student population, analyzed student performance over the two years prior to implementation. That performance was compared against performance for sections in the two years prior to implementation. Both the student withdrawal rate and the passage rate were affected. The withdrawal rate decreased significantly, from 18.4% to 11.3% and the passage rate increased from 57.2% to 79.8% after implementation (Cheng & Swanson, 2011). Additional studies have shown that students' interaction with online course content was a significant contributor to course satisfaction (Basioudis & deLange, 2009).

Immediate feedback, a cornerstone of web-based tutorials, has been shown in previous studies to improve both student satisfaction and performance. A study was conducted in 2008 included 14 sections of seven economic courses offered at Labovitz School of Business and Economics at the University of Minnesota Duluth. Each section used online homework, which was included in the student's course grade. Surveys queried students concerning their attitudes about whether they benefited from online homework. Findings supported that students found online homework beneficial and appreciated the immediate feedback (Doorn, Janseen, & O'Brien, 2010).

Student satisfaction has been shown to improve when online tutorials are added to classes. Universities are concerned with student persistence, and often relate persistence with student satisfaction levels, believing that more satisfied students are more likely to complete their respective academic programs. Research demonstrates that web-based

tutorials motivate students to spend additional time working online homework problems, and consequently are more confident in their skills, leading to greater academic persistence and success (Sargent, Borthick, & Lederberg, 2011; King & Mo, 2013; Allain & Williams, 2006; Cnidine & Flannery, 2011).

### **Summary**

The purpose of this study was to determine whether web-based tutorials in on line accounting courses had a significant effect on student satisfaction or the achievement of learning outcomes. Finally, analysis was conducted to determine if course level had a moderating impact on the effect of web-based tutorials on the achievement of learning outcomes. Three research questions were asked and three hypotheses were evaluated. The findings of this study failed to demonstrate that web-based tutorials had a statistically significant effect on either student satisfaction or the achievement of learning outcomes. A final review of the problem statement, purpose, method, limitations, ethical dimensions, along with recommendations for practical applications of the study and recommendations for future research are addressed in Chapter 5.

## Chapter 5: Implications, Recommendations, and Conclusions

Higher education is undergoing a period of transition, both in the student demographics and technological advances. Change is particularly present in online education, where students are drawn from a more diverse demographic and geographic base. At the same time, enrollment in online programs outpaces brick and mortar enrollments. The annual growth of online enrollments is 10% compared to a much smaller annual growth of 2% in on-site enrollments (Koohang & Paliskiewicz, 2013). Online education is quickly becoming a preferred delivery method (Dereshiwsky & Rich, 2011), highlighting the importance of effective online pedagogy. An increasingly implemented pedagogy is the use of web-based tutorials in online accounting classes. The specific problem of interest is that the academic impact of the usage of web-based tutorials on the achievement of learning outcomes is not well understood.

The purpose of this quantitative, non-experimental, correlational study was to determine whether the use of web-based tutorials is related to student satisfaction and the achievement of learning outcomes in online accounting courses, and whether controlling for course level affects any such relationship. Specifically, the study examined the effect of the usage of web-based tutorials in undergraduate online financial accounting and intermediate accounting I, II, and III at National University, a non-profit university headquartered in California and enrolling students throughout the United States. A total of 528 students were studied: 278 students enrolled in courses without the use of web-based tutorials and 250 students enrolled in courses using web-based tutorials. Student demographics included students from a variety of locations within the United States. National University also has a military presence in the student body. It is possible that

students participating in the study were stationed outside the United States. The findings of this study could be used to enhance online pedagogy, specifically addressing whether web-based tutorials contribute to the achievement of learning outcomes in online accounting courses.

This correlational study was used to quantify the relationship between web-based tutorials in online accounting classes on both student satisfaction and the achievement of learning outcomes. A non-experimental, correlational research design was used because this type of test allowed for associations between variables. This study was predictive because the observers lacked control over variables. However, the study was not designed to determine causality. Instead, the purpose was to identify the existence and strength of any relationship between the usage of web-based tutorials and student satisfaction or the achievement of learning outcomes. T-tests were used to determine if there was a statistical difference in either mean student satisfaction scores or class GPA between courses not utilizing web-based tutorials and those classes which utilized web-based tutorials.

This study was designed to address the notable gap in academic literature concerning the achievement of learning outcomes with the use of web-based tutorials. Primarily, studies to date have focused on subjective measures such as student satisfaction or motivation; few have focused on objective measures such as the demonstrated achievement of learning outcomes as measured by course grade or course GPA (Cheng & Sanson, 2011). Still, this study had several limitations in both method and design. Differences in final course grades may not directly relate to the usage of web-based tutorials. Faculty teaching styles may have influenced results of both student

satisfaction and course grade. The study may have not included a sufficient number of sections to evaluate each outcome. Both instructor interaction and individual student efforts may have influenced the results of both student satisfaction and the demonstrated achievement of learning outcomes. It was not possible to control all variable that might have affected student satisfaction or course grades.

This study used archived data of student's satisfaction level, as indicated on end-of-course evaluations and final course grades, aggregated into a class GPA, reported by course section and title and separated into classes which utilized online web-based tutorials and those whose classes did not utilize web-based tutorials. No specifically identified student data was collected and no live participants were studied. The study met the ethical requirements of both National University and Northcentral University. No releases were required from students because no personally identifiable data was released. Both National University and Northcentral University granted IRB approval (Appendix 1 and 2).

This chapter will discuss each research question and the related hypothesis. Any, implications related to each research question will be explored. Findings of this study will be evaluated. Potential limitations will be discussed. Recommendations will be made based on the findings and limitations of this study. The conclusions drawn will be summarized.

### **Implications**

Three research questions were evaluated during this study. The focus of the questions was whether the usage of web-based tutorials in online accounting classes had a significant impact on student satisfaction or the achievement of learning outcomes, as

measured by end-of-course student satisfaction surveys and course GPA. Each research question was answered through the analysis of a related hypothesis. Independent t-tests were used to determine whether the null hypothesis should be supported or rejected. In all three cases, the null hypotheses failed to be rejected.

### **Effect of Web-Based Tutorials on Learning Outcomes**

The first research question focused on whether the achievement of learning outcomes was significantly different when web-based tutorials were utilized in online accounting courses. Specifically the question and related hypotheses were as follows:

**Q1:** What is the difference, if any, between final course grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials?

**H1<sub>o</sub>:** There is no difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials.

**H1<sub>a</sub>:** There is a difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting classes not utilizing web-based tutorials.

To answer these question independent t-tests were performed to measure the difference in mean class GPA between all studied accounting classes, which did not utilize web-based tutorials and all included online accounting classes which did include web-based tutorials. Results of the study indicated that the null hypothesis should fail to be rejected. The p value for this t-test is 0.615. Measured against the alpha value of 0.05, any amounts exceeding the alpha value suggest that the null hypotheses should fail

to be rejected. In this case, the test failed to reject the null hypothesis, supporting that there is no difference between final course grades in online accounting courses utilizing web-based tutorials and online courses not utilizing web-based tutorials. Similarly, the answer to question one is that there is no significant difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.

The results of this study were surprising as it contradicts many published studies which evaluated components of web-based tutorials and found them to be advantageous to students' achievement of learning outcomes. For example, previous studies have found that interaction with online tools enhances learning outcomes, as measured by final exam scores (Perra & Richardson, 2010). Likewise, the use of online video clips have been shown to boost comprehension and test scores (Schacter & Szpunar, 2015). Past research also consistently supports the benefits of tailoring course delivery to individual students' learning styles, an objective only possible in an online environment and one that is more easily achieved through the use of web-based tutorials. Research supports that students learn most effectively when instruction is tailored to their specific learning styles (Rogowsky, Calhoun, & Tallal, 2015; Tan & Laswad, 2015). Web-based tutorials include demonstration problems which appeal to a wide range of learners including: visual, kinesthetic, activists, theorists, reflectors, divergers, assimilators, convergers and accomoators (Shahababi & Uplane, 2014; Rogowsky, Calhoun, & Tallal, 2015; Tan & Laswad, 2015). Another study quantified the difference in passage rates, indicating that the use of web-based tutorials increased passage rates from 57.2% - 79.8% (Cheng & Swanson, 2011). Immediate feedback, another feature of web-based tutorials, has also

been found to encourage a deeper understanding of the concepts being studied (Carter, Smith, & Ste-Marie, 2016). It seemed logical to conclude from past research that web-based tutorials would significantly impact the achievement of learning outcomes.

### **Course Level and Effectiveness of Web-Based Tutorials**

The second question explored whether course level moderates the effectiveness of web-based tutorials on the achievement of learning outcomes. Courses were divided into two levels: the lower level included financial accounting and the upper level included intermediate accounting I, II, and III. The questions and related hypothesis were as follows:

**Q2:** Does course level moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses?

**H2<sub>o</sub>:** Course level does not moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses.

**H2<sub>a</sub>:** Course level does moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses.

To answer this question, two independent t-tests were conducted. One compared the mean GPA of lower level courses not utilizing web-based tutorials with lower level courses utilizing web-based tutorials. The second test compared mean GPAs of upper level online accounting courses not utilizing web-based tutorials with courses utilizing web-based tutorials. Neither p value was less than the alpha of 0.05. The p value for the lower level courses was 0.367 and the p value for the upper level courses was 0.468. The fact that neither test indicated a statistically significant difference between the mean courses GPA when utilizing web-based tutorials versus not utilizing web-based tutorials,



indicated that the null hypotheses should fail to be rejected. Therefore, it is assumed that course level does not moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses. The answer to the research question is, therefore, that course level does not moderate the relationship between utilization of web-based tutorials and final course grade in online accounting courses.

Although the results are still surprising for the same reasons indicated when discussing the first research question, it is important to note that little literature exists comparing the effects of online pedagogy in lower level courses versus upper level courses. Thus, there are no identified studies to serve as benchmarks. Research does support, however, that one would expect to find an improvement in the achievement of learning outcomes when utilizing web-based tutorials, regardless of the course level. For example, a study conducted at a southwest university included accounting students enrolled in a variety of accounting courses demonstrated that overall students utilizing web-based tutorials improved test scores (Cheng & Swanson, 2011). Likewise, a study conducted with an introduction to computers class at a university in Turkey also demonstrated increased exam scores when using web-based tutorials (Pundak, Schacham, & Herscovitz, 2013). Historically, research has purported that the extra instruction, readily available online, potentially improves the mastery level of all students (Sargent, Borthick, & Lederberg, 2011).

### **Web-Based Tutorials and Student Satisfaction**

The final question strived to determine if there was any connection between the use of online web-based tutorials and student satisfaction. The question and related hypothesis were:

**Q3:** What is the difference, if any, between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials?

**H3<sub>o</sub>:** There is no difference between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.

**H3<sub>a</sub>:** There is a difference between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.

To answer this question an independent t-test was conducted comparing the mean satisfaction score from end-of-course evaluations in online financial accounting and intermediate accounting I, II, and III which did not use web-based tutorials with online financial accounting and intermediate I, II and III courses which did use web-based tutorials. The difference between the two groups mean satisfaction scores was not significant. The p value was 0.102. Any amount, which exceeded the alpha value of 0.05 indicates that the null hypotheses should fail to be rejected. Therefore, it is assumed that there is no difference between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials. In answer to question three, there is no difference between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials.

Once again, the result of this test is surprising because previously reviewed literature indicates there is a link between increased student satisfaction and the use of

web-based tutorials, either as component pieces or implemented in their entirety. Prior studies indicate that the immediate feedback provided as an integral part of web-based tutorials more actively engages the learner and improves student persistence (Harrison, Konings, & Molyneux, et al., 2013). Additionally, a study involving every accounting section over a two year period indicated that online tutorials reduced the withdrawal rate significantly, from 18.5% to 11.3% (Sancho-Vinuesa, Escudero-Viladoms, & Masia, 2013). Research also supports that online tutorials improve students' engagement, motivation and time on task (Lee, Hsiao, & Ho, 2014). The use of online videos was shown to activate emotions, stimulate interest and reinforce key learning concepts (Stephen, 2015). It is reasonable to assume that all of these factors would also indicate increased student satisfaction.

### **Limitations**

The results in this study may be due to several limitations. The GPAs for the courses evaluated were aggregated, rather than accounting for individual student's achievements. Whereas 528 students were included in the sample, the scores were aggregated for each class, resulting in only nineteen courses. Only nineteen data points were considered for mean class GPA. Using average GPAs for this analysis may have included outliers, which were not identified prior to the aggregation of the data. Outliers can skew the results and should be identified and considered to accurately apply statistical tests. Also, students who stopped participating but failed to drop the course may be included in the average of the final GPAs. The impact of this situation is not identifiable using aggregated data.

Additionally, it is possible that individual faculty members curved grades which resulted in higher class GPAs. This is especially possible because National University encourages the achievement of a mean class GPA. Although the intent of the policy is to prevent grade inflation, in a course which is particularly rigorous and accelerated, faculty conceivably may have increased students' final grades. If this occurred, it is also possible that the curves were more substantial in the courses without web-based tutorials, and less necessary in courses which utilized web-based tutorials. Curving grades would eliminate any significant gap in course GPA.

Another limitation is that differences in final course grades may not be related to the effectiveness of web-based tutorials. The final course grades are determined by several scores, including homework, online live-chat attendance, and participation in online discussions, weekly quizzes, a term paper, and final exam grade. Several of these assignments do not directly measure the achievement of learning outcomes. For instance, earning high grades for attendance, discussions and the final paper would mask lower scores earned on the quizzes and final exam. Similarly, a student may have performed exceptionally well on the quizzes and final exam, but failed to participate in the discussions or to submit a final paper, significantly lowering the course grade.

Final course grades may have been affected by differences between individual students or cohorts of students. Even the time of year enrolled in the course may have impacted final scores. For example, students enrolled during the summer or over a holiday like Christmas, may have been affected by the additional responsibilities associated with caring for out of school children and increased family responsibilities. Both the quantity and quality of study time may vary based on the time of the year. The

classes included in this study took place over a period of time where courses may have been unevenly measured over holidays such as the summer and Christmas.

Although the format of each course was initially identical, instructors are both allowed and encouraged to add materials to their classrooms. Some instructors add a variety of rich supplemental resources; others add little. Engagement also differs between instructors. Instructors are required to lecture online, in a synchronous format, at least 4 hours per week. Some instructors may lecture less; other instructors include additional lectures beyond what is required. There is no indication in the data how much lecture time was invested in each course. Lecture time alone could impact the students' achievement of learning outcomes.

Additionally, the lecture times are at the instructor's discretion. Some faculty members lecture in the evenings, when most students are available. Others lecture when it is more convenient for the faculty member. All lectures are recorded; one might assume that attendance is not mandatory for the presentation of course concepts. However, attendance and engagement may be affected by the timing of the online lectures. Any differences in lecture timing were not considered in the evaluation of the data.

Student satisfaction may be influenced by factors other than the usage of web-based tutorials. The quality of the synchronous lectures and the overall engagement of the instructor in the course may impact student satisfaction. How quickly an instructor returns grades or provides feedback can affect student satisfaction. Additionally, the personal style of an instructor and their availability to help during the week, when a student is struggling, might affect student satisfaction. It is challenging to attribute

changes in satisfaction to the usage of web-based tutorials as it is impossible to control all the variables and outside stresses that might have affected student satisfaction.

### **Recommendations**

Higher education is changing rapidly, and online enrollment is continuing to thrive (Heider, 2015). Online class sizes and course offerings are exceeding those in face-to-face classes. Students' satisfaction and achievement of learning outcomes is essential to universities needing to retain students as well as businesses needing to hire competent accountants. Understanding the impact of web-based technology on the achievement of learning outcomes may assist universities in the development of robust and effective academic accounting programs (Fajardo, 2014).

Although the results of this study did not support the conclusion that web-based tutorials significantly affect student satisfaction or the achievement of learning outcomes, the contradictory results of prior research coupled with the limitations of this study suggest that further research is warranted. Additional studies could be conducted, which include larger samples. Studies that utilize pre- and post-tests would be worthwhile conducting, as would studies which evaluate the effects on learning outcomes as measured by final exam score, rather than course grade. It would be advantageous to use data which shows individual student scores rather than aggregated GPAs. It would be interesting to further explore the differences between the achievements of learning outcomes of business students versus those students enrolled in an accounting concentration. A study comprising students from multiple universities would provide a more holistic approach to researching the questions. One might also consider including an analysis of the amount of time students invested in the course, as time spent on task

would also impact the final course grades and the achievement of learning outcomes. Similarly, analysis of the different types of resources being used by the student during online tutorial access would be helpful in determining an understanding of which resources are deemed most helpful to students.

### **Conclusion**

Results of this study failed to show that web-based tutorials significantly affected student satisfaction or the achievement of learning outcomes. Instead, the study showed that there is no difference between final course grades in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials. The study also concluded that course level does not moderate the relationship between utilization of web-based tutorials and final course grades in online accounting courses. Finally, the study also concludes that there is no difference between student satisfaction in online accounting courses utilizing web-based tutorials and online accounting courses not utilizing web-based tutorials. However, the results of this study are contradictory to the findings in other studies which do indicate a relationship between components of web-based tutorials and both student satisfaction and the achievement of learning outcomes.

Several studies have shown that components of web-based tutorials either improved student satisfaction, the achievement of learning outcomes, or both. Web-based tutorials were found to clarify errors in students' approach to problems, judgement and approach, improving the achievement of learning outcomes (Attali, 2015). Also, the immediate feedback available in web-based tutorials engages the learner, improves learning outcomes, as well as student persistence (Sancho-Vinuesa, Escudero-Viladoms,

& Masia, 2013). Studies also verify that online tutorials can improve overall course grades (Cheng & Swanson, 2011). Considering the support for the benefits of web-based tutorials, as well as the limitations in this study, additional study on the effects of web-based tutorials in online accounting courses is appropriate.



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Appendixes



## Appendix A: Northcentral IRB Approval



**Date:** 7/1/16

**PI Name:** Catherine McBride

**Chair Name (if applicable):** Dr. Meena Clowes

**Application Type (Initial, Modification, Pilot):** Initial

**Review Level: N/A – Not Human Subjects Research (NHSR)**

**Study Title:** A Quantitative Study of the Effect of Web-Based Tutorials on the Achievement of Learning Outcomes in Online Accounting Courses

Date of Determination of NHSR status: 7/1/16

Dear Catherine:

The purpose of this letter is to inform you that your research application was evaluated, and a determination was made that the research does not meet the federal definition for research involving human subjects. As such, IRB review and oversight are not required.

If you determine that any changes will need to occur in the procedures or data set as described in this application, please resubmit a new research application, select the modification option, and describe the proposed changes. The IRB will evaluate the modification and revise the determination as needed. If the study does meet the definition of research with human subjects after the modification, the IRB will inform you of any additional requirements at that time.

Thank you, and best wishes as you conduct your research!

Respectfully,

Northcentral University Institutional Review Board

Email: [irb@ncu.edu](mailto:irb@ncu.edu)

## Appendix B: Power analysis and sample size

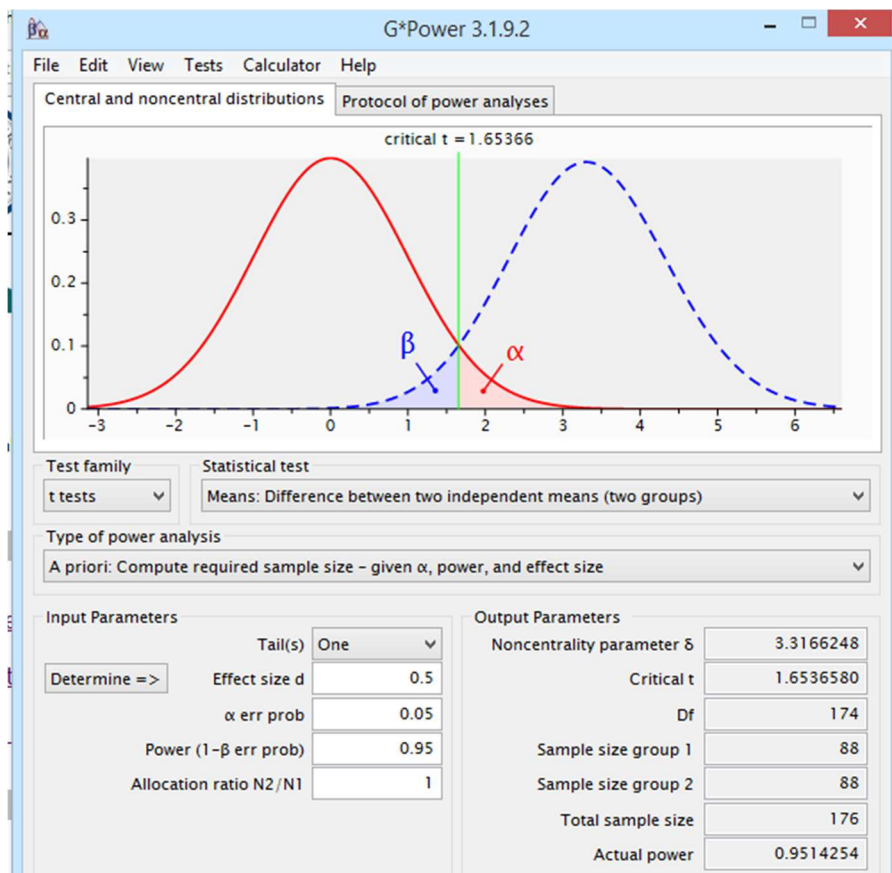


Figure 1. Power analysis and sample size determination using \*G Power

## Appendix C: Hypothesis Testing

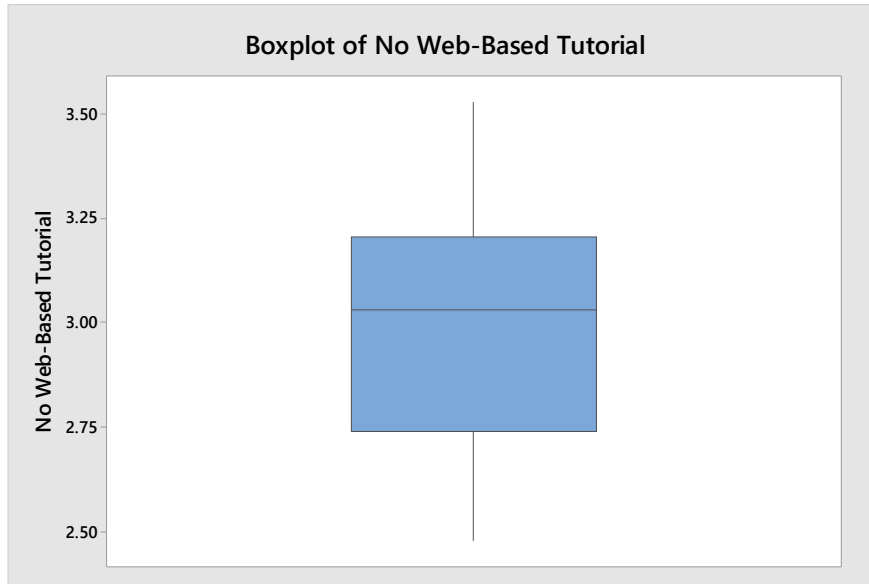


Figure 2. Box plot of Course GPA for courses without web-based tutorials.

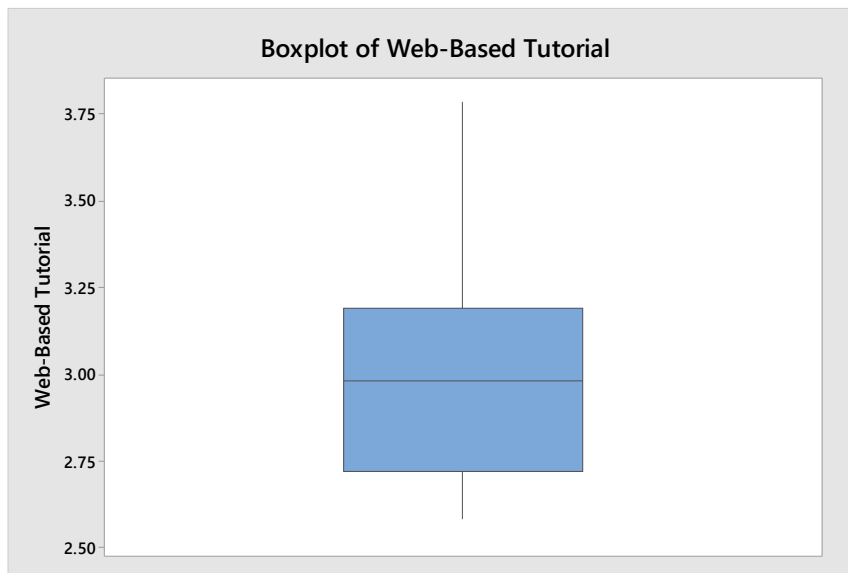


Figure 3.. Box plot of course GPA for courses with web-based tutorials.



Figure 4. Box plot for student satisfaction in courses without web-based tutorials.



Figure 5. Box plot for student satisfaction in courses with web-based tutorials.

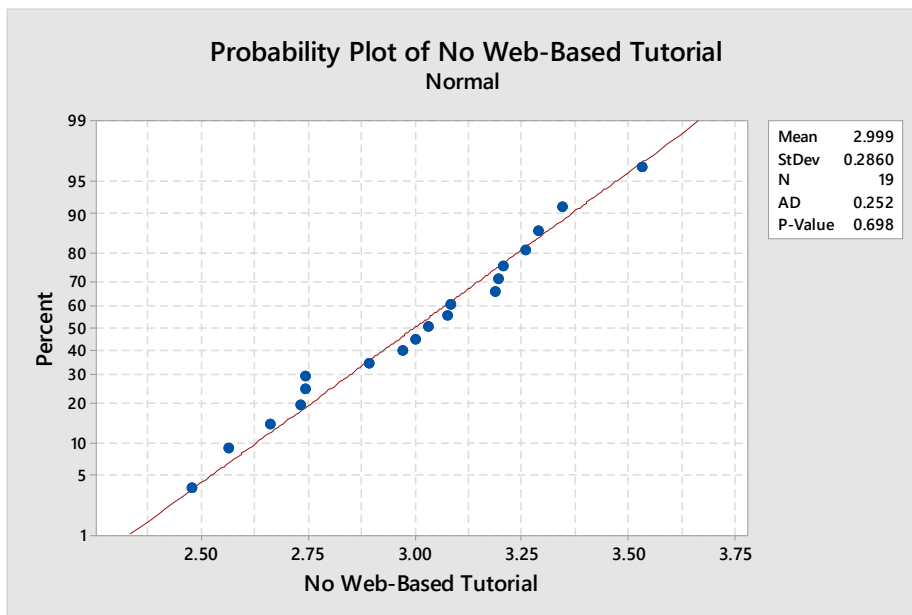


Figure 6. Anderson-Darling normalcy test for course GPA, no tutorial.

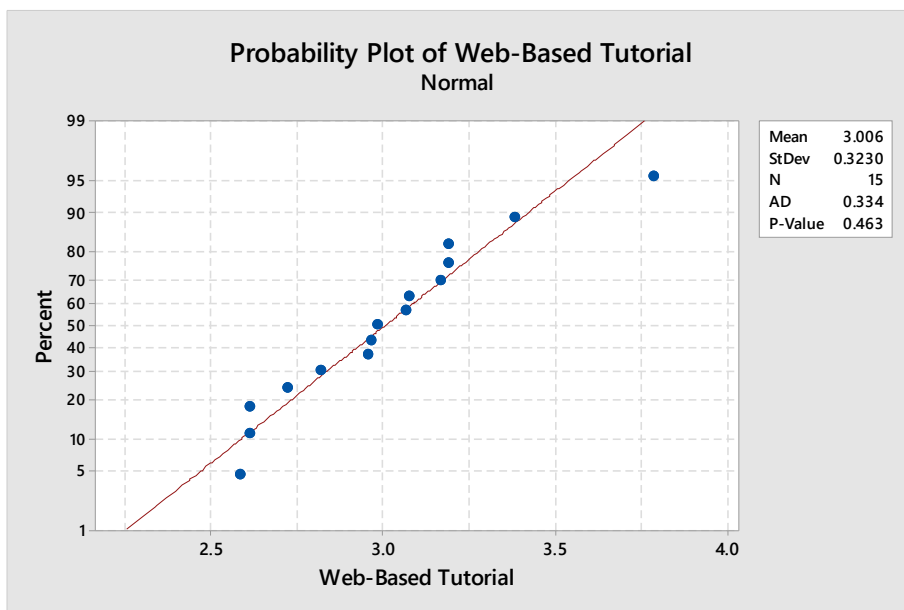


Figure 7. Anderson-Darling normalcy test for course GPA, tutorial.

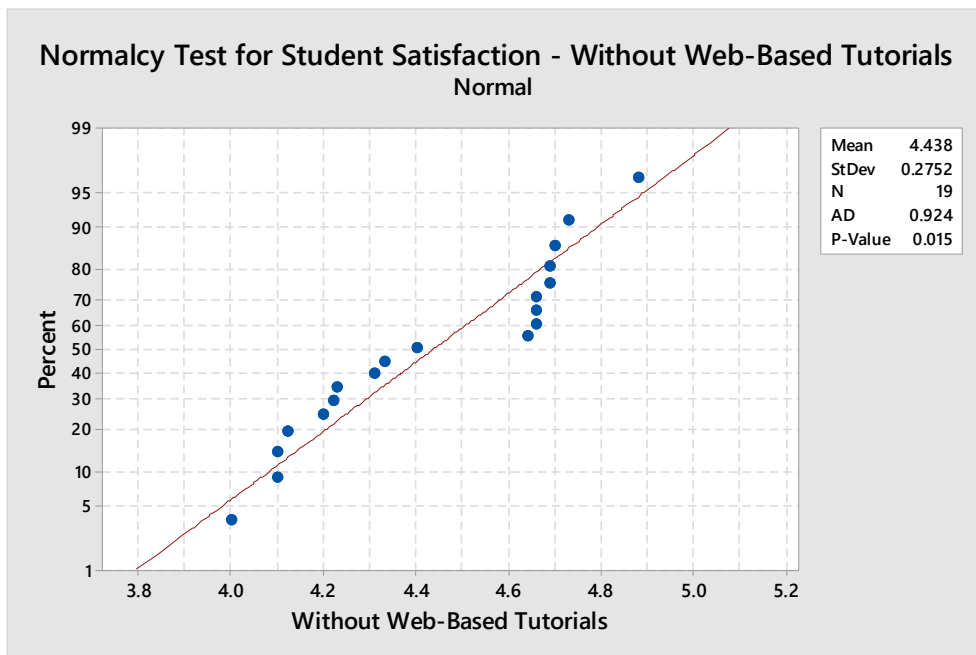


Figure 8. Anderson-Darling normalcy test for student satisfaction no tutorial.

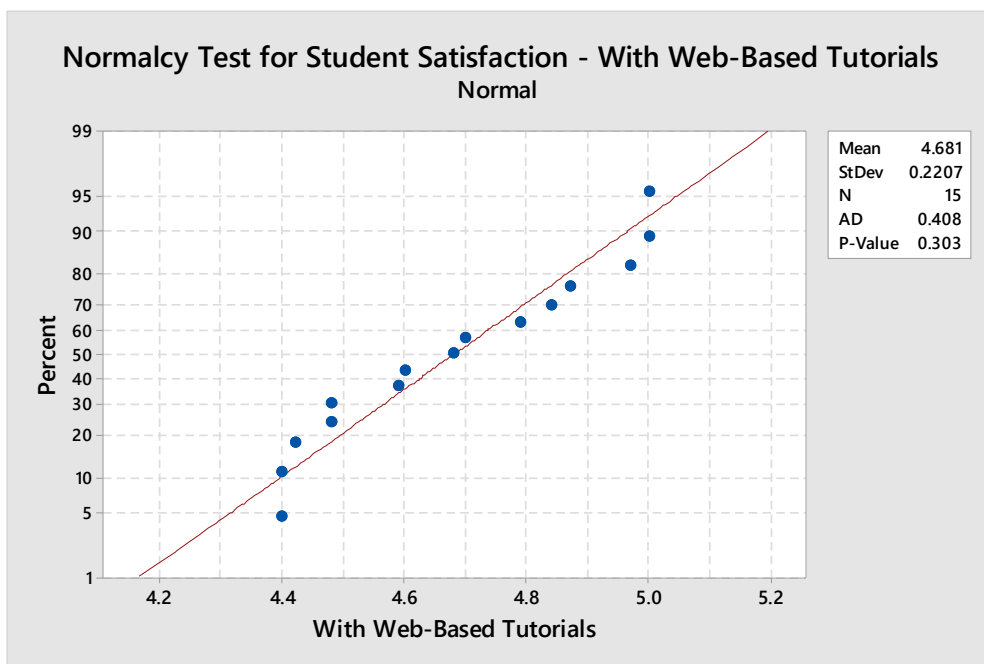


Figure 9. Anderson-Darling normalcy test for student satisfaction tutorial.

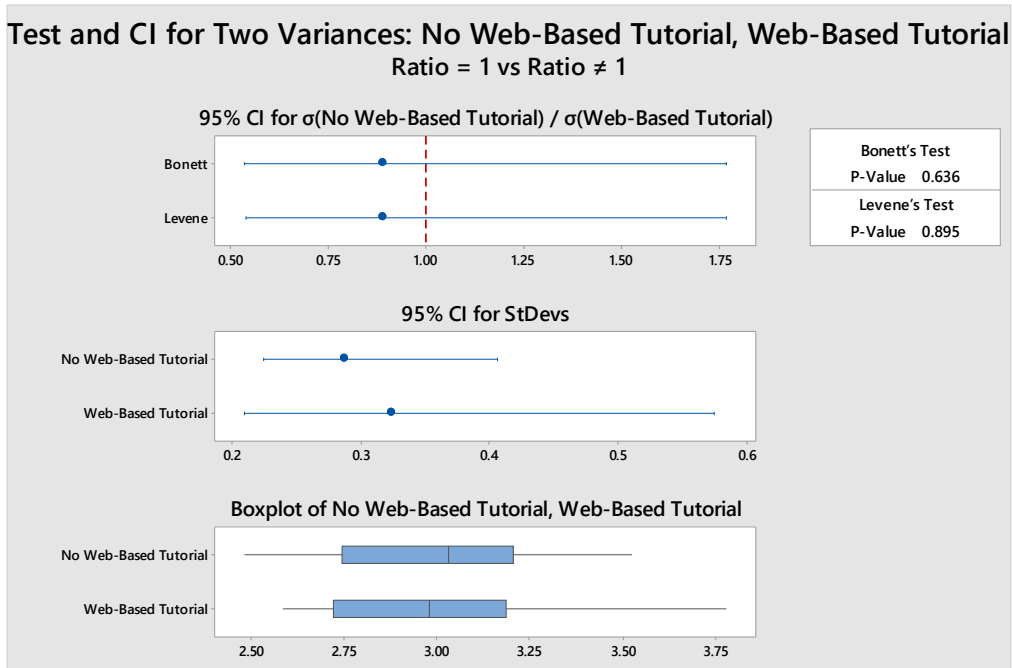


Figure 10. Bonnett's and Levene's test for homogeneity no tutorial

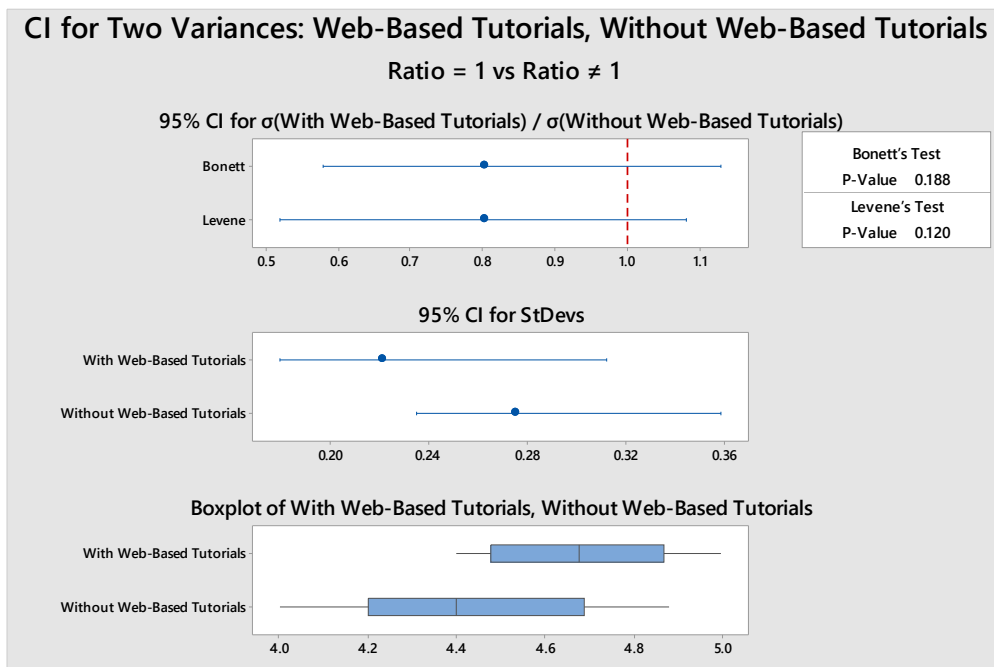


Figure 11: Bonnett's and Levene's test for homogeneity tutorial.

## Appendix D: Comparison of Course GPA

*Comparison of GPA for courses where students used web-based tutorials (n=250) versus those courses where students did not use web-based tutorials (n=278).*

Course	Description	Non Web-Based Tutorials		Web-Based Tutorials	
		# Enrolled	GPA	# Enrolled	GPA
ACC 201	Financial Accounting	19	3.344	23	2.964
ACC 201	Financial Accounting	16	3.206	27	3.167
ACC 201	Financial Accounting	19	2.972	20	3.783
ACC 201	Financial Accounting	20	2.563	31	2.955
ACC 201	Financial Accounting	14	2.479		
ACC 201	Financial Accounting	20	3.289		
ACC410A	Intermediate Acct I	13	2.892	12	2.583
ACC410A	Intermediate Acct I	15	2.660	20	3.190
ACC410A	Intermediate Acct I	20	3.074	12	2.818
ACC410A	Intermediate Acct I	10	2.730	20	3.063
ACC410A	Intermediate Acct I	7	3.529		
ACC410B	Intermediate Acct II	9	3.256	11	2.609
ACC410B	Intermediate Acct II	19	2.742	17	2.982
ACC410B	Intermediate Acct II	17	3.194	15	2.720
ACC410B	Intermediate Acct II	10	3.030		
ACC410C	Intermediate Acct III	9	3.000	6	3.380
ACC410C	Intermediate Acct III	13	3.083	12	2.609
ACC410C	Intermediate Acct III	16	3.188	15	3.073
ACC410C	Intermediate Acct III	12	2.742		3.189
		<u>278</u>		<u>250</u>	



## Appendix E: Comparison of Student Satisfaction

*Comparison of GPA for courses where students used web-based tutorials (n=250) versus those courses where students did not use web-based tutorials (n=278).*

Course	Description	Non Web-Based Tutorials		Web-Based Tutorials	
		# Enrolled	Satisfaction	# Enrolled	Satisfaction
ACC 201	Financial Accounting	19	4.330	23	4.480
ACC 201	Financial Accounting	16	4.700	27	4.600
ACC 201	Financial Accounting	19	4.640	20	4.870
ACC 201	Financial Accounting	20	4.200	31	4.680
ACC 201	Financial Accounting	14	4.660	0	
ACC 201	Financial Accounting	20	4.730	0	
ACC410A	Intermediate Acct I	13	4.310	12	5.000
ACC410A	Intermediate Acct I	15	4.690	20	4.790
ACC410A	Intermediate Acct I	20	4.660	12	4.480
ACC410A	Intermediate Acct I	10	3.430	20	5.000
ACC410A	Intermediate Acct I	7	4.840	0	
ACC410B	Intermediate Acct II	9	4.220	11	4.420
ACC410B	Intermediate Acct II	19	4.690	17	4.700
ACC410B	Intermediate Acct II	17	4.660	15	4.000
ACC410B	Intermediate Acct II	10	4.230	0	
ACC410C	Intermediate Acct III	9	4.120	6	4.590
ACC410C	Intermediate Acct III	13	4.880	12	3.910
ACC410C	Intermediate Acct III	16	3.810	15	4.840
ACC410C	Intermediate Acct III	12	4.100	9	4.970
		<u>278</u>		<u>250</u>	