New Approaches to Online Accounting Education

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Introduction

Over the last decade, higher education has experienced a growing number of disruptions. State support of universities has declined substantially and significant changes have been made to the federal financial aid system. There have been greater calls for accountability and evidence documenting the value of a college education. Two disruptive forces in particular, the rise in online education and financial pressures for state-funded colleges, have resulted in an increase in the number of courses, including business and accounting courses, being offered online. With the growth of online accounting courses, some have questioned their quality relative to traditional face-to-face classroom accounting instruction. In fact, a recent Gallup poll finds only about a third of the survey respondents rate online programs as "excellent" or "good" (Bidwell 2013). Many accounting educators are responding to these questions by pioneering new approaches to online accounting instruction. These approaches often focus on capturing and assessing data generated from online students to obtain insight into strategies that enhance the effectiveness of online accounting classes. This paper provides an overview of the current status and future prospects of online accounting education, focusing on mechanisms designed to enhance its effectiveness.

The Growth and Needs of Online Education

Online education has seen great growth in the last ten years, which is likely to continue in the future. A recent study by Elaine Allen and Jeff Seaman of the Babson Survey Research Group at Babson College reveals that in 2011 total online enrollment grew at a rate of about 9%;

during the same period total college enrollment was virtually unchanged (Allen and Seaman 2013). Further, between Fall 2002 and Fall 2011, the compound growth rate in students taking at least one online course was about 17% per year. For comparison purposes, the compound growth rate in the overall higher education student body was about 2% per year. Enrollment projections from Eduventures Market Research firm indicate present and anticipated declines in the population of traditional-age students (18-22 years old) that can be offset by gains in the adult-age market (23+ years old; Eduventures 2012). Given the substantial growth in online education, it is not surprising that 69% of chief academic leaders at the university level feel that online education is a critical component of their long-term strategy (Allen and Seaman 2013).

Universities have experienced financial stress in recent years. According to a report issued by the State Higher Education Executive Officers, state and local support for higher education dropped to $5,906 per full-time equivalent student in 2012, a 25-year low in inflation-adjusted dollars. Further, state and local funding for universities has decreased over 24% since 2008 alone. Funding allocations for many state universities are heavily influenced by the average time it takes students to complete their degrees. Given this financial strain, higher education institutions have begun to develop robust online offerings to expand market share and generate revenue, often in alignment with state or national workforce development efforts and goals. The growth in the population of students enrolled in online classes and the need of many universities to enhance revenues to offset decreases in state funding will likely cause these observed trends in online education to continue.

Given the recent and forecasted growth in online education, there is a significant need to develop techniques to ensure that the quality of online accounting education is equivalent to that offered in a traditional face-to-face classroom. While substantial advances have been made in

the delivery of online content, there is always room for improvement. Towards this end, we share our experiences with learning analytics in a principles of financial accounting course offered online. Learning analytics are defined as "the interpretation of a wide range of data produced by and gathered on behalf of students in order to assess academic progress, predict future performance, and spot potential issues" (New Media Consortium, 2011, The Horizon Report). The use of learning analytics creates a personalized learning experience for online accounting students which enhances the amount of information that they learn while providing data useful to help target problem areas. We believe that learning analytics can be of great benefit to the quality of online accounting education.

The paper proceeds as follows. In the next section of this paper, we define models of online education. We outline the strengths and weaknesses of online education, placing emphasis on how they impact the accounting curriculum. We conclude by summarizing the outcomes of a pilot learning analytics program that was implemented into the Ball State University Accounting program, funded by a grant received from the National Association of State Boards of Accountancy (NASBA).

What is Online Education?

Developing a concise definition of online education is difficult as many accounting classes contain both traditional face-to-face and online delivery. Allen and Seaman (2013) developed the following table to define this concept.

(Insert Table 1 here)

Most accounting courses in traditional colleges and universities are web-facilitated. Web-facilitated courses meet in a traditional face-to-face setting and utilize technology to

enhance student learning outcomes. In such courses, content such as PowerPoint slides, homework assignments and grades are provided to students online. In contrast, blended courses do not meet in a face-to-face setting as often as traditional or web-facilitated courses. Frequently, these courses include lectures that are recorded by the professor and homework problems that are either electronically graded or graded by the professor. Many courses in this format utilize online chat rooms and message boards. For example, in a blended course, there may be an online discussion board centered on a proposed FASB standard.

However, many accounting courses are moving beyond web-facilitation and are now becoming solely online courses. These courses typically have no (or very limited) face-to-face meetings. Some fully online programs require students to visit campus once a year (or once during the program) for live content. Typically, online course content is delivered through a learning management system. This platform facilitates interaction occurs among students, between students and faculty and provides a platform for testing. Many online courses are highly structured such that students are expected to proceed through the course material on a pre-defined schedule and monitor their performance through online grading systems. In a typical week in the course, the professor may post video lectures, require students to complete online assignments, participate in chat rooms or discussion boards and take quizzes and exams.

Strengths and Weaknesses of Online Education

A recent survey of university administrators documented three commonly perceived barriers to widespread adoption of online learning (Allen and Seaman 2013). First, most university administrators feel that online students need to be more disciplined than students taking face-to-face classes. The second perceived barrier is retention as fewer online students

tend to finish their courses and complete their degrees compared to their on-campus peers. This is a significant problem given the increased emphasis by many state legislators on student retention and timely graduation rates. The final barrier documented in the study is lack of acceptance of online degrees by potential employers. While the percentage of administrators that expressed this concern is lower than the previous two items, the status of online degrees has very important implications for the reputation of the university. An examination of the strengths and weaknesses of online instruction is presented below for institutions, instructors/faculty members and students.

College and university administrators must weigh the costs and benefits of online education. Administrators often view online education as a strategy for delivering courses to a larger audience of students, which extends the market reach for their institutions, and thereby increases tuition revenue. While this holds true for many marquee programs, most institutions have found their online offerings only reach a regional demographic. While such programs may increase revenue, there are substantial costs associated with online education. Specifically, the online accounting programs require extensive startup costs (new technology and faculty training in online teaching methods) and continuing costs (student advising and overhead). The cost of training a professor to teach effectively in an online environment can be substantial. However, effectively preparing faculty to teach online is essential to ensuring that the quality of online accounting students is equal to those that graduate from traditional accounting programs.

From the faculties' prospective, developing a high quality online course requires the alignment of course objectives, instructional materials and exams with course technology while maintaining a student's engagement in the course. This structured environment typically leads to higher satisfaction from the students and, anecdotally, many faculty members report this aspect

of online course design improves their face-to-face classes as well. Oftentimes, the transition of courses to an online environment facilitates creativity of the faculty resulting from the implementation of multimedia tools and other educational technologies. Use of these multimedia tools can engage both online and on-campus students. For example, a faculty member can present his or her lecture on depreciation, supply links to applications of depreciation on various websites, provide problems for homework through the assignment tool in the course software and enhance student engagement through a discussion board question regarding the theoretically appropriate method of depreciation.

Most faculty members in traditional classrooms can tell you how they get students in a face-to-face course to engage in conversations with the instructor and classmates. A perceived weakness in online instruction is the lack of required engagement. A discussion-laden environment, a hallmark of an effective classroom, is not as easily replicated in an online course. However, technologies such as discussion boards, online office hours, study groups and virtual whiteboard sessions can increase engagement, but these tools require additional training and the active participation of the students and the faculty member. For that reason, many faculty members have remained skeptical that online education can have the same level of learner engagement as a face-to-face course.

There are advantages and disadvantages to online accounting instruction for students as well. Pre-recorded lectures can allow students to review material as many times as necessary to learn difficult concepts. For example, an intermediate accounting student studying pensions can review recorded lectures multiple times, allowing the student to better understand the subject matter. To be successful in an online setting students must display high levels of motivation and good study and time management skills, skills that are critical to success in the accounting field.

Further, teaching and learning in online courses increasingly occurs via video conferencing, social networking, and instant messaging, methods of communication that are becoming more widely used in the accounting profession. A key disadvantage of online education is that the educational requirements of some state boards of accountancy limit the amount of courses that can be taken online for CPA exam candidates. For example, the Texas State Board of Public Accountancy requires that candidates for the CPA exam take half their upper division accounting courses in a traditional face-to-face setting.

New Approaches to Online Accounting Education: The Power of Analytics

Given the growth in online accounting education and the continued strong demand for accounting graduates, it is critical that educators and practicing accountants work together to ensure online accounting programs effectively prepare students for entry into the profession. Online programs must strive to ensure that their students possess the same skills as students from traditional face-to-face programs. To achieve this goal, new educational techniques and technologies must be developed to engage online accounting students.

The goal of online accounting education must be to match, or even improve, on the quality of education in the traditional face-to-face classroom setting through the use of educational software. In a traditional classroom setting, professors use many techniques to engage students and stimulate inquiry. Many teachers in a traditional classroom have become adept at assessing comprehension through interactions with students. If the quality of online education is to match that which occurs in a face-to-face setting, these attributes must be replicated through the use of technology. For example, an online instructor cannot respond to the students' behavior that suggests a lack of understanding. However, with the aid of recently

developed educational software, information about an individual student's understanding of a topic can be obtained. This provides the instructor with the opportunity to address weaknesses of students at an individual level, allowing for discussion and feedback.

Through a grant from the NASBA, we have begun to study whether the emerging area of learning analytics is one of the methods through which educators will equate outcomes between face-to-face and online courses. In general, educational analytics seek to quantitatively measure the learning produced from student efforts and assignments. Analytics data then can be used by the online accounting student and the instructor to improve teaching and learning. Two critical areas where analytics can be useful in an online course are in evaluating a student's preparedness to learn new, difficult material and in assessing his or her problem solving skills and learning strategies.

For Ball State's online accounting analytics project, we focused on creating a learner dashboard that contained a pre-test on material from prior chapters that is essential to successful completion of the current chapter (referred to in educational theory as prior learning assessments) and questions which required the students to reflect on and demonstrate understanding of difficult concepts (referred to in educational theory as metacognitive questions). Pre-tests evaluate the competencies that a student needs to have in place before completing a new learning module or weekly assignments (Council for Adult and Experiential Learning 2010). Metacognitive questions provide students with insights about their own cognitive abilities, their grasp of the accounting discipline and what they know about themselves as problem solvers (Schliefer and Dull 2009). Learning analytics can give an instructor real time information about how students are comprehending, applying and synthesizing course materials.

Additionally, learning analytics can be made adaptive, recognizing a student's grasp of the content and increasing the difficulty level in a personalized way.

A typical course module incorporating our online learner dashboard is portrayed in Figure 1. Students enroll in the same manner as they do a traditional face-to-face course. Once a student enrolls in a course, he or she is given access to a course website through a learning management system. Similar to face-to-face classes, the majority of online courses offered by traditional universities follow a weekly schedule. In the regular delivery of this type of online course, each student is given access to the new weekly material. All students follow the same course plan, and therefore, the lectures, readings, assignments and exams are available to students simultaneously.

(Insert Figure 1 here)

Using funds from the NASBA grant, we developed a custom designed online learner dashboard we refer to as Homework Improvement and Testing System or *HITS*. In our online accounting course students began each week by logging into the *HITS* website and they first had to complete a short quiz to assess whether they had successfully mastered the prerequisite knowledge from prior chapters necessary to understand the material in the current chapter. The pre-tests administered using the *HITS* software were not counted as part of the students grade; however, students were told if they answered correctly immediately upon the completion of the test. We designed our prior learning assessments to judge both the student's confidence in his or her answer and ability to correctly answer the question. In other words, since we were testing prior knowledge that the student should already have mastered, we did not want students to guess the answer to any problem or question. It is important that students do not guess because if they guess the correct answer, they would not receive the feedback necessary to help them improve

their understanding of the topic. To prevent this from happening, we designed pre-test questions that asked students if they are confident in their knowledge of the topic. If the student is not confident he or she can answer the question the treatment is the same as an incorrect answer: the student is provided additional activities to increase their understanding of the topic. Only after students indicated that they were confident in their knowledge of the topic were they provided the potential answers to the question. This is one of the ways in which learning analytics differs from other kinds of online educational software.

The pre-tests were then electronically analyzed by *HITS*, through new capabilities developed in the platform through NASBA funding. Through *HITS*, students were provided with immediate feedback and suggested remediation strategies based on their performance. For example, if pre-test questions suggest that a student does not understand the rules of debits and credits, the student would be directed to watch an additional lecture on the topic, review material in the textbook, and complete additional homework exercises. The professor receives both the results of individual student's performance and the aggregate class performance. Based on the professor's assessment of the student's performance, he or she may decide to modify course content to mitigate the deficiency identified in the pre-test. This pedagogical strategy—facilitated by learning analytics—connects to "just-in-time" teaching practices, where student activities that occur outside of classroom (such as prior learning assessments in *HITS*) form a "feedback loop" that can lead the instructor to modify or supplement their weekly lesson or instructional materials in a rapid, real-time manner (Novak 1999).

Following these steps to mitigate individual and class-wide learning deficiencies, new course material is introduced. Each module of the course taught at our university includes a video lecture with PowerPoint slides, homework assignments that must be completed during the

week, as well as required participation in an online discussion board. At the end of the week, the students are given a quiz to assess their performance on the new material. The professor is available to the students through online office hours conducted via chat room.

Upon the conclusion of the weekly module, students are asked to complete a metacognitive question. The goal of this question is to ensure that the students have a solid conceptual understanding of the accounting topic demonstrated in the chapter. The open-ended nature of the responses provides students an opportunity to explain in their own words what they understood or did not fully comprehend from that week's new concepts and materials. These metacognitive responses are combined into a single report delivered to the instructor, which allows the instructor to identify if there are any remaining issues that need to be addressed with individual learners. An example of a metacognitive question used in the class asked students to describe why bonds were sold at a premium or a discount. Instructors can also recognize if there are any patterns or similarities in the responses to assess the learning trends in the class as a whole. Unlike traditional assessments like exams and quizzes, listening to the students' voices and their explanations are the primary goal. A metacognitive reflection provides an in-depth snapshot of a learning moment that gives educators a fuller picture of their students' personal views of their performance and level of understanding.

Learning analytics projects like *HITS* provide new perspectives for online students. Intelligent data can highlight the sources of their learning successes and underscore problems and misunderstandings which should be rectified. Analytics can aid both the learner and the instructor through the learning cycle of a new module, as it is a form of intervention and engagement that tracks the students' understanding of the topic from before the start of a weekly lesson to its conclusion. *HITS*, and projects like it, can complement and reinforce other learning

activities that students will need to master as to enhance the quality of online accounting education.

Effectiveness of Learning Analytics

The effectiveness of learning analytics has been documented in prior educational research. Though these studies do not specifically examine the application of learning analytics to online accounting students, they provide sound evidence of the success of these techniques. We have included a list of published articles in the appendix to this paper for the reader who would like more detail on the topic. To further assess the usefulness of the *HITS* platform, we conducted a survey of students in our online accounting section. Response rates were relatively high (50% of online students completed the survey) given that the survey was not a course requirement. The majority of online accounting students were male (69%), majoring in something other than accounting or business (69%) and expected to earn either an A (46%) or B (39%) in the course.

Participants were asked to answer a series of questions regarding their experiences with the *HITS* platform. These responses were recorded using a five point Likert scale with '5' representing strongly agree and '1' representing strongly disagree. Perceptions of the *HITS* platform were consistently high in the online accounting section, with respondents indicating the platform was easy to use (mean of 4.0) and were a good assessment of prior knowledge of the material (mean of 3.7). The pretest provided respondents an accurate sense of readiness to learn the new material (mean of 3.9). Students in the online section, on average, believed the pretest module prepared them better for the coming week's assignments (mean of 3.9).

Further qualitative survey responses from online students indicated the pretest modules prepared students to ask questions of the instructor and re-read portions of the text and/or class notes. Many students reported higher homework scores and test grades for those modules in which pretests were offered. For some, gaining exposure to the material ahead of time enabled them to practice more and develop the belief they could do well on assessments.

Degrees the Profession Can Trust: The Future of Online Accounting Education

With the growth of online education, accounting graduates are entering the market with transcripts that include online courses; others have completed fully online degree in accounting. To assess the quality of these candidates for entry level positions, it is important to consider the quality of the program from which they graduated. As we have previously discussed, there is a lot of variability in both the extent that course material is delivered online and the methods used to deliver the online content. As online education becomes commonplace on the campuses of traditional colleges and universities across the country, methods have been developed and will continue to be developed to ensure that students receive high quality accounting instruction. We believe that online accounting programs that include new pedagogical methods such as learning analytics modules and metacognitive exercises are a significant advance in ensuring that the quality of an online degree is the equivalent of its traditional counterpart. Ultimately, we believe a quality online program can produce quality accounting graduates. Firms and companies hiring such individuals must review the program content and delivery methods carefully to ensure that it provides its graduates with the skills and abilities necessary to be successful in the field of accounting.

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Appendix: References for Further Research on Learning Analytics

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3. New York Times Article:
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Table 1: The Spectrum of Online Content in Courses		
Percent of Content Delivered Online	**Type of Course**	**Typical Description**
0%	Traditional	Course where no online technology used – content is delivered in writing or orally
1 to 29%	Web Facilitated	Course that uses web-based technology to facilitate what is essentially a face-to-face course. May use a courses management system (CMS) or web pages to post syllabus and assignments.
30 to 79%	Blended	Course that blends online and face-to-face delivery. Substantial portion of the content is delivered online, typically uses online discussions, and typically has a reduced number of face-to-face meetings.
80+%	Online	A course where most of all of the content is delivered online. Typically have no face-to-face meetings.

Figure 1: Accounting Course Module with Learning Analytics