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The Professor as Craftsman in the Digital Age

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The architecture of the university classroom has remained very much the same from its beginnings at the University of Bologna in 1088 to the present day (Hunt 2008). If one were to walk into the classroom of a contemporary American college or university it would look very much the same as the classrooms of Salamanca, Paris, or Oxford a millennium ago. If we were to find ourselves in a classroom of a medieval university we would find a teacher standing in front of a room speaking. If we were to see the view from the lectern in the medieval university, we would see rows and rows of students in desks taking notes about what the professor said. It looks very much like the modern university. From the beginning, the professor did his or her work in isolation from other professors. The professor was alone in a classroom with their students as they were alone in their research and scholarship. From the beginning of the European university, there was little team teaching and there is little evidence that teams created syllabi together (Hunt 2008). While a few classes used the Socratic method, science labs, periods of disputation, and study groups, the main method of delivery in the university has been the lecture. The professor is an individual craftsman and one of the products that they produce is the lecture (Brown and Rice 2008). Like craftsman who make pots, paintings, or unique furniture pieces, the lecture as product of the professor is absolutely their own creation. They are solely responsible for its content and form and it is not verified or checked by anyone else. Just as other craftsman work in isolation, the professor does so because he or she is the expert in the field they lecture in. While Bologna has claimed to be the first university founded in 1088, the first modern university is often thought to be the University of Paris, founded around 1190. The University of Paris is regarded as the first modern university because Bologna was founded by a student guild and was student run. The first faculty guild was thought to be at the University of Paris, where the faculty governed the university. From that time to the present, faculty governance has been an essential hallmark of institutions of higher education. Why have faculty had the power in the university? The faculty had the power because they had the expertise and one product of that expertise was manifested in the spoken lecture. Students would come to universities to hear the lectures of famous professors. The lecture is a solitary activity and a good lecturer is often thought of as a "good teacher." Teaching is the thing that was measured and valued in the early literature of the university.

The lecture is a one-time event that had to be scheduled at a particular time and place. Three hours a week of a college class are more often than not three hours of lecture. The lecture is a kind of performance that could not be captured in writing because it varied class by class. In this way the professor is like a traditional craftsman. A good cabinet-maker may be able to recognize the work of another craftsman in the same field. The great craftsmen leave their own mark and have their own distinctive style. In the long history of the university, there was no mass production of the lecture and there was no way to exactly to capture the style of the great lecturers. The lecture becomes a kind of performance art. The professor is a like craftsman whose work is distinguished from all others by the uniqueness of their personality and style. But just as woodworker is limited by the quality of the wood she works with or a sculptor the quality of the marble, so a teacher must adapt to the quality of the student body. This means that

English101 in the most elite Ivy League will probably be a very different course than English 101 in an urban community college weekend class for working adults.

A professor may teach the same course year after year or more commonly they will teach more than one section of the same course. Professors often talk of the number of preparations they have, meaning number of unique courses that they are teaching. In a typical American college or university, a teacher may teach four courses a semester, three sections of Introduction to Chemistry and one section of Organic Chemistry. Or they mean teach three sections of Introduction to Art History and one section of The Impressionists. While teachers often use notes, they vary the lectures within those notes. Just as every chest of drawers a cabinet-maker would create would be unique and singular, so each lecture was different from the others even in other sections of the same course taught by the same professor. Because of this, the classroom was an ephemeral event and could not be captured except in the notes of the teacher and students. This ephemeral event in time is the work of a singular artist. The great teachers had a unique style that might be compared to a chair designed by Frank Lloyd Wright that shows his stamp. So the professor delivers his or her lecture in a unique way. For a millennium the professor has been a craftsman whose work cannot be tampered with by anyone.

What is less commonly known is that many college professors arrive at the university with no training in pedagogy. Professors are trained to be researchers and not teachers. So while there is training in how to do scholarship, footnote articles, solve problems, and decipher texts, there is no formal training in pedagogy. Professors learn on the job as they teach. In most graduate schools there is little discussion of grade books, classroom management, or learning theory unless you take your degree in education, where it is the primary subject matter.

If professors are not trained to teach, how do they learn the craft of teaching? Most learn to teach through their work as a graduate assistant or the informal apprenticeship of their first university or college position. But this is not quite the same as on-the-job training. It may be wrong to even use the word “apprenticeship” in this context. The difficulty in calling it an apprenticeship is that from day one each professor works alone. From the first day they arrive at the university the professor is alone in class and historically there have not been faculty training courses on how to teach. It was assumed, although they had not been formally trained, they know how to perform the function. Thus each professor develops their own style often in total isolation from other professors.

So the university began, evolved, and so it stayed for almost a thousand years. And for the first thousand years there was nothing to compare the classroom to except another classroom. A professor could only be compared to another professor. Until just a few decades ago this was the case. All discussions about teaching were and are subjective. What is good teaching for one student or in one school may not been viewed as so by another student or another school. So it was impossible to say with any certainty what was a good class, what was a bad class; what was good teaching, or what was bad teaching. It was all a matter of opinion as in the old Latin expression *De gustibus non disputandum est*: taste cannot be disputed.

Because there was nothing to compare the classroom to, it was hard to say what good teaching was. With the creation of the online classroom something very dramatic happened that could be argued to be the biggest revolution in the history of the university. With online learning came a new kind of classroom, a different kind of classroom, a classroom with a dashboard that everyone could read. Suddenly there was something with which to compare the traditional classroom. While there are similarities, there are differences between the traditional brick and mortar classroom and the digital classroom. It is not our place here to review the extensive

literature on the differences and the argument that one is superior to the other. We want to focus on one single facet of the digital classroom. The digital classroom leaves a fingerprint of every single transaction. A record of all these exchanges is recorded in the digital classroom. The digital classroom leaves a public document in a way that the physical classroom never did. This is a substantial difference from the traditional classroom.

But does not the brick and mortar classroom leave a record? It may be said that professor's notes, class syllabi, or student notes gave us a record of the physical classroom. Let us look at these artifacts in some detail. There is no standard for either college syllabi or professor notes. It might be argued that if there are best practices in these areas, they are not widely known or widely followed. Student notes are notoriously unreliable, as anyone knows who has tried to reconstruct a professor's lectures by comparing different student notes. Student notes are oftentimes more about those subjects of interest to the student than an objective interpretation of the teacher's lectures.

Online classes leave a record of every interaction by both professors and students. As soon as online learning appeared there was, for the first time, something to which the physical classroom could be compared. Once this happened we could begin to measure the difference between physical classrooms and online classrooms. For the first time in the history of the university, the class left a record that was an objective result of the interactions.

What is the difference between the old and new classrooms? If we were to take a database from an online classroom and look at the interactions in a discussion board we may find patterns very easily. Let us say for example that in week one of a course there are a hundred online posts between students and faculty. Let us say in week two we find a similar number of posts. Imagine now we found that in week three the number messages was below 25 messages. While the sheer quantitative data does not provide a final answer it provides an indication that something has changed. While it may be exam week or Spring break it may also be an indication that the lecture was not structured correctly, the students were having difficulty, or some other issue that can be analyzed and corrected in future classes. This kind of granularity has not historically been possible in the brick and mortar classroom.

But this is only the beginning of the difference between the two classrooms. With the growth in data collection and predictive analytics we are now able to take the data from the online classroom and do many things with it. Once we are able to map out the interactions of teacher and student and to apply complex data gathering to the patterns of interaction we can see where students are succeeding and where they are failing (Huba and Freed 2000). The data trail shows us where students are lacking responses to questions. The data trail will show us those elements of tests on which the vast majority of students have difficulty. The data trail will shows where the instruction could be clearer for the benefit of the learning.

For a thousand years the professor worked alone as an individual because there was no way to capture or compare his style. Now in the age of digital classroom data gathering gives us tools we did not have before. Suddenly we find we can do analyses of data that were not possible just 30 years ago. Assessment in the digital classroom can be done with more rigor and data than can be done in the physical classroom. The current demand for assessment would not have been possible without the data collection brought about by the digital revolution.

All this leads to new questions. What does the birth of the online classroom mean for the future of the university? How will it impact the role of the professor? How will it change the definitions of teaching and learning?

For a millennium, the classroom was the sole domain of one professor. The digital classroom is by nature more communal. This means educational theorists; instructional designers, assessment professionals, and others can now look at an online classroom and clearly see where students are succeeding and where they are failing. For the first time in a thousand years, the classroom can be looked at by a number of people using data not opinion.

Before it was not clear how a professor's teaching could be measured. But with the digital classroom the focus has turned from teaching, which is ephemeral and subjective, to learning, which can be measured in a more rigorous way. The focus of the traditional classroom was on the success of a professor as teacher. The digital classroom now focuses us on how successful the learning environment is. As Robert Barr puts it; "A paradigm shift is taking hold in American higher education. In its briefest form, the paradigm that has governed our colleges is this: A college is an institution that exists to provide instruction. Subtly but profoundly we are shifting to a new paradigm: A college is an institution that exists to produce learning. This shift changes everything" (Barr and Tagg 1995).

When the industrial revolution took place there was the move from individual craftsman to factory worker. When this happened the whole concept of work changed. The craftsman no longer worked in his own shop and now he now had to commute to work. The concept of time changed as now a team had to begin and end at the same time. There was the change from lone craftsman to worker who was part of a larger team. The craftsman was totally in control of the artistic process from beginning to end. The craftsman could stop and start work when they felt like it because they depended on no one else. In the "dark satanic mills" of Blake's verse we find people running to keep up with the speed of the loom and powered shuttlecocks. What does this analogy mean for the future of the professorate?

The change from professor as craftsman to professor as team member is in part a direct result of the digital revolution. Once there is a digital record of the class this record can show us where learning is taking place and where the experience can be improved. When the classroom leaves a physical artifact, this is no longer something that can only be understood by the professor. The physical artifact or digital record can we worked on by team of experts and learning theorist who can use the data to learn. This fundamentally changes the image of the professor as craftsman and changes his status to the member of a team who works to improve student learning. This shift from lone professor to learning team is a fundamental change in the nature of University.

If we were to take a look at how one online for-profit university uses data to improve the educational experience of students we can see what is possible. At the American Public University System there are more than 100,000 students and 2000 professors 100% online. This gives the university a large chunk of data to see how learning is progressing. The university uses analytics to analyze the number of drops, number of withdrawals, and number of failures class-by-class, program-by–program, and school-by-school. They then compare these numbers to university averages, school averages, and program averages. For example, the failure rate in Arabic I may be much higher than in the course History of Popular Culture but that does not indicate the second class is successful and the first one is not. However if we were to look at say History 101 and found that in one section taught by one professor the number of drops, withdrawals, and failing grades was triple the rest of the program this would be a starting point for a discussion about the class. A rigorous teacher is not necessary a bad teacher but we must keep in mind the goal of the class is student learning. If that is not taking place it is the responsibility of the university to ask "Why?" In addition, the American Public University

System uses national benchmarked tests by Princeton's Educational Testing Service (ETS) such as the Proficiency Profile and Major Field Tests in various majors. This shows them where they stack up against other colleges and other programs.

At the end of each class the University uses the Community of Inquiry (COI) end of class survey to measure the indirect experience of the student. The COI is a scientifically validated instrument that has been taken by more than 500,000 online students and was designed to measure the efficacy of the online classroom (Boston and Boston 2010). This instrument looks at three kinds of presences. Social presence measures how much social engagement there is in the classroom as a learning environment. Teaching presence measures the student's perception of the effectiveness of the teacher as leader of the class. Cognitive presence measures the student's opinion of how successful the class has been designed and set up as a learning environment. By combining drops, withdrawals and failing grades with the ETS data and the COI data we are beginning to get a more complete picture of the online classroom. This combination of direct and indirect measures helps us understand what is going on in the classroom.

But this university is not done yet. Using IBM's SPSS Modeler and predictive analytics they have analyzed more than 80 variables of student data such as gender, age, GPA, number of credits transferred in and so on. They can use this data to predict which students are likely to succeed and which need interventions. Other universities have used similar measures to manage student success with varying degrees of accuracy

One of the hallmarks of the university has been the role of the faculty in governance. Faculty has the responsibility of governance because of their expertise as scholars (Birnbaum 1988). With the introduction of online learning to the university this can be seen to challenge the professor's role as expert. While professors are experts in their subject matter, many are not experts in pedagogy and learning theory. There are now instructional designers, faculty development specialists, and learning theorists who can contribute to the student success in new ways.

For example, I took my Ph.D. in philosophy and never took a single class in teaching, pedagogy, classroom management, or student management. I knew nothing about learning theory. I started my first job teaching Introduction to Philosophy in a local college. I walked into the first class and began to teach much like "Athena was born full grown sprung from the head of Zeus." Athena was not a baby—she was born full grown. The idea of the professor is also that there is no gestation period. They come to their profession full grown and mature in their craft.

If we challenge the idea that experts in biology and psychology and philosophy may not be experts in teaching we challenge the fundamental idea of the University.

With the digital classroom there are new tools and new roles for the professor (Christensen and Eyring 2011). The classroom as communal means the professor is being decentralized. As this happens the very concept of the power of faculty is challenged. Since the birth of online learning there has been a significant hostility to digital classrooms by members the professorship. Suddenly cheating online became an issue of focus in online courses when in fact it has been an issue for the whole history of the university. Suddenly there were questions about the quality of online learning when in fact these questions apply just as well to the traditional classroom. We will argue that there is a good reason for this. For the first time in the history of the university, there is public record of the class that can be accessed by those who are not experts in the field. This changes the balance of power and the structure of teaching. It changes how we think about grading. It challenges some long held beliefs about academic freedom.

The university was the domain of faculty. One of the central roles of faculty was to teach and teaching is something they do alone. The digital classroom has made the university a place where learning can be rigorously assessed. This change decentralizes teaching (along with the teacher) and makes learning the heart of the enterprise.

The digital universities redefined the role of the traditional professor (Donoghue 1988). The digital revolution has redefined the role of faculty in assessing learning.

We have looked at the metaphor of the professor as craftsman and his craft was teaching. There was no objective measure to compare one craftsman to another. The online professor does something wholly different. He or she can be viewed as a digital collaborator who is a partner in an enterprise of learning whose results can be measured and compared with other classes. This is seismic revolution that has only begun to be felt in the academy and whose impact has only begun to be understood.

About the Author

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References

Barr, Robert B., and John Tagg. 1995. "From Teaching to Learning: A New Paradigm for Undergraduate Education." *Change Magazine*.

Birnbaum, Robert. 1988. *How Colleges Work: The Cybernetics of Academic Organizations and Leadership*. Jossey Bass.

Boston, Wally, and Phil Ice. 2010. "An Exploration of the Relationship Between Indicator of the Community of Inquiry Framework and Retention in Online Programs." *Journal of Asynchronous Learning Networks* 13 (3).

Brown, Sally, and Phil Rice. 2008. *Lecturing: A Practical Guide*. Kogan Page Limited.

Christensen, Clayton, and Henry Eyring. 2011. *The Innovative University: Changing the DNA of Higher Education from the Inside Out*. Jossey Bass.

Donoghue, Frank. 1988. *The Last Professor: The Corporate University and the Fate of the Humanities*. Fordham University Press.

Huba, Mary, and Jann Freed. 2000. *Learner-Centered Assessment on College Campuses: Shifting the Focus from Teaching to Learning*. Allyn and Bacon.

Hunt, Janin. 2008. *The University in Medieval Life, 1179–1499*. McFarland

Newfield, Christopher. 2008. *The Unmaking of the Public University: The Forty Year Assault on the Middle Class*. Harvard University Press.

An Inquiry into Relationships between Demographic Factors and Teaching, Social, and Cognitive Presence

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Abstract
One-third of all college students leave their institution after the first year. As exponential growth continues at online institutions of higher education, it is vital to uncover factors that contribute to student success and therefore impact persistence and matriculation. The Community of Inquiry framework includes three presences, teaching, cognitive, and social designed to assess the educational experience of the online learner. In this study, approximately 113,000 cases from a large national fully online university were examined to determine if student characteristics, e.g., student gender, ethnicity, and age, are a factor in the level of the three presences. Multiple semester sessions were analyzed across curricular areas. Results and recommendations are discussed.

KEY WORDS: Online learning; Retention; Higher Education; Gender Issues; Ethnic Membership; Adult Learners; Student Achievement

Introduction

Frustration is high at institutions of higher education as low levels of retention continue to plague these organizations. Students attend multiple institutions or choose to not persist in their goal of degree attainment as one-third of all college students leave their institution after the first year (Barefoot 2000; Marklein 2005; Kinzie 2009). Lack of academic preparation, deficiencies in support services, disconnection between students and faculty, and disengagement of students are all cited in the literature (Braxton 2000; Chickering and Gamson 1987; 1991; Kuh 2007; McCabe 2000; Tinto 1993; 2004) as reasons for students to become at risk of leaving college.

Undergraduate and graduate enrollment at both nonprofit and for-profit institutions of higher education in the area of online or distance learning has grown exponentially in the last decade. Annual figures from the 2008–2009 school year illustrate that since 2007, there has been a 17% increase in the number of students in postsecondary institutions taking an online course. Over 4.6 million individuals, or one in every four students, are opting to pursue higher education online (Greer 2010). Due to increased student enrollment, universities struggle with increased retention issues. Aragon and Johnson (2008) determined that attrition rates for online courses at some community colleges were 20% higher than face-to-face courses. Unfortunately, there is little research available concerning retention and best practices at fully online institutions. Additionally, little work exists about the online adult learner, yet there are institutions with a large majority of non-traditional learners. Further, studies focusing on student demographic characteristics as a factor in student engagement and retention are greatly needed.

Best practices for the traditional college classroom are not necessarily the same for online learning. Different eLearning and pedagogical models can assist educators and instructional

designers in creating, developing, and applying content and courses for students in online learning environments. One of the most recognized models of online learning, the Community of Inquiry (CoI) Framework, utilized by various institutions of higher education, educational leaders, and other organizations, provides explanation for best practices in online learning. Tested, validated, and used for development, instruction, assessment, and evaluation, the CoI guides practitioners in their creation and application of methods and tools to support student learning and add to opportunities for deeper engagement in the course, increased academic success, and continued persistence in education. Community is the foremost component of the CoI. Students who view themselves as part of a community of learners within the course, and, throughout the program, are more engaged as community is "an essential element in achieving the higher levels of learning associated with discourse and collaborative learning" (Ice and Kupczynski 2009, para 2).

Three main components, or presences, provide the structure of the CoI Framework: teaching, social, and cognitive (Garrison, Anderson, and Archer 2000; Swan et al. 2008). Design, facilitation, and direction laid out for the cognitive and social presences create the navigational map for a learner. The instructional elements of the teaching presence must connect the student meaningfully to learning outcomes. Activities within the course, the architectural framework of the discussion, and flow of facilitation, as well as contact with students through direct instruction, focusing, and resolving issues, complete the presence (Garrison, Anderson, and Archer 2000). Bush et al. (2010) determined that teaching presence is a significant factor in online and blended courses and that when teacher presence is low then student participation and satisfaction is low. Muilenburg and Berge (2005) reported a significant relationship between teacher presence and a student's enthusiasm for the class.

Social presence is the degree to which participants in computer-mediated communication feel socially and emotionally connected (Garrison, Anderson, and Archer 2000, Swan et al. 2008). Social presence sets the climate of the learning environment and supports discourse about content between students (Garrison, Anderson, and Archer 2000). A product of the interaction between classmates, this presence builds on cognitive learning by encouraging discourse and critical thinking (Garrison, Anderson, and Archer 2000). Muilenburg and Berge (2005) found a strong correlation between social interaction in an online course and student enjoyment. Their study showed that the lack of social interaction within the online environment was a significant obstacle to the students' satisfaction with the class, their efficacy in the class, and the probability of their enrolling in another online class (Muilenburg and Berge 2005).

Cognitive presence is the extent to which learners, through triggering events, exploration, integration, and resolution of ideas, can construct and confirm meaning in that which they learn. Additionally, reflection of content and discourse with fellow students and faculty on subject matter further scaffold learning (Garrison, Anderson, and Archer 2000; Swan et al. 2008). Cognitive presence focuses on selection of content as well as supporting discourse within the classroom. Aragon and Johnson (2008) state that effective online courses need to "address individual differences, motivate the student, avoid information overload, create a real-life context, encourage social interaction, provide hands-on activities, and encourage student reflection" (p. 155).

Theoretical Framework

As of May 2010, American Public University System (APUS) boasted the second-largest body of CoI survey data available, with the SUNY Learning Network having only a slightly larger data set. Housing of this data allows the institution to derive meaningful analyses and help improve programs moving forward. Within the data lies specific information concerning student demographics. From the CoI framework, a common measurement instrument was created to fully capture each of the presences (Arbaugh et al. 2008). This effort resulted in a 34-item measurement tool with statistically validated items that operationalize concepts in the CoI model. Student responses to statements about his or her online experience clustered around items as defined by the CoI framework theory. Utilized by institutions of higher education, the survey can provide detailed insight into student experiences as related to the three presences. Analyses of student demographic characteristic data as a factor of the presences may provide insight into student engagement of the creation of knowledge, and not just a collection of facts. As the institution from which the data was obtained includes a very large majority of non-traditional learners, investigation into the data may provide information yet to be fully reported in the literature and assist educational leaders in decision making. The purpose of the study was to determine if student demographic differences are a factor within the three CoI presences (teaching, cognitive, and social) at a large national fully online university.

Research Questions:

(1) Is gender a factor in the level of the three Community of Inquiry (CoI) presences (teaching, cognitive, and social) for students enrolled at a large national fully online university?
(2) Is ethnicity a factor in the level of the three CoI presences (teaching, cognitive, and social) for students enrolled at a large national fully online university?
(3) Is age a factor in the level of the three CoI presences (teaching, cognitive, and social) for students enrolled at a large national fully online university?

Method

Data from 18 months of end of course surveys for both undergraduate and graduate courses was obtained for this study. Total cases selected for the study included 113,194 responses. The population included fully online learners at a large national for-profit online institution of higher education. The institution as a whole serves military, military affiliated, and civilian students with over 90% of students over the age of 24. Conversely, from most colleges in the U.S., males constitute a majority of students enrolled at the university (Braxton 2000; Nelson Laird et al. 2004).

American Public University System (APUS), founded in 1991, is an online, for-profit university. First created as American Military University (AMU) a second virtual university, American Public University, was added in 2002. Fully accredited under the Higher Learning Commission of the North Central Association (NCA), granted in May 2006, APUS serves the needs of military students, those in public service, and civilians alike. As of early 2010, APUS served over 60,000 students a day offering nearly 80 degrees. Students in 109 countries participate in courses that commence at the beginning of each month as either eight or 16-week courses. APUS offers certificates, Associate degrees, Bachelor degrees, and Master degrees.

Archival data were acquired from the APUS Office of Institutional Assessment through a request for data. Information requested was provided to the researchers through an Excel file for all end-of-course survey responses. Data sets were examined for integrity, resulting in the removal of 10,028 entries, leaving 103,166 data sets in the final analysis.

Data were analyzed in three separate linear regressions, using the forward method of entry. In the regressions, mean scores for aggregated Teaching, Social, and Cognitive Presence items served as the criterion variable. Predictor variables consisted of a binary variable representing gender, a binary variable representing traditional versus non-traditional status, and four dummy binary variables representing ethnicity (Caucasian, Hispanic, Black, and Asian). As the use of dummy variables is incompatible with analysis of variance (Field 2005), regression analysis was utilized with the assumption that heteroscedasticity would be an issue.

This use of a binary dependent variable with linear regression is supported in the literature even though it compromises the assumption that residuals are normally distributed about the predicted DV scores (Cohen et al. 2002). The number of subjects included in this study (n = 103,166) ensures adequate statistical power by far exceeding the minimally adequate sample sizes suggested by Green (1991). Multicollinearity is a limitation inherent in this study given the instances of high correlations among the predictor variables.

One significant advantage of using linear regression is that it provides a coefficient of determination. The term *coefficient of determination* refers to a statistic that defines the percentage of variance explained for by the predictor variables. For this reason, the coefficient of determination (expressed as *Adjusted* R^2 in regression) helps program directors and administrators decide how heavily to use the results in guiding their decision-making for programmatic improvement. Further, the forward method of entry was used to order predictor variables by their relative statistical significance and variance accounted for in the predictive model.

Results

Table 1. shows the number of students in each demographic category:

Table 1.

Student demographic frequencies

Student demographic variable	*n*
Gender	
Male	69,122
Female	34,044
Ethnicity	
Caucasian	76,343
Black	14,444

Hispanic	10,316
Asian	2,063
Age status	
Non-traditional	
Traditional	89,755
	13,411

For the Teaching Presence subscale, the aggregate mean was 4.367 with a standard deviation of 0.806.

Forward method linear regression resulted in three of the variables being statistically significant predictors of the criterion variable (the aggregate mean of teaching presence indicators) (Table 2).

Table 2.

Forward method linear regression predictors of criterion variable: teacher presence

	Unstandardized coefficients		**Standardized coefficients**		
	B	**SE**	**Beta**	**t**	**Sig.**
Constant	4.403	0.006		729.790	0.000
Ethnicity—Caucasian	−0.096	0.006	−0.052	−16.840	0.000
Gender—Female	0.062	0.005	0.036	11.461	0.000
Traditional student status	−0.048	0.007	−0.020	−6.459	0.000

The relative contributions of each of the predictor variables to the significant predictive model are listed in the Model Summary below. The *Forward* method in SPSS enters predictor variables one by one in order of decreasing significance. Table 3, therefore, illustrates the changes in Adjusted R^2, for the significant predictors of the criterion variable, as each variable is entered:

Table 3.
Adjusted R^2 for the predictors of the criterion variable: teaching presence

Model	*R*	R^2	Adjusted R^2	Standard error of the estimate	R^2 change
Ethnicity—Caucasian	0.050[a]	0.003	0.003	0.8049280	0.003
Gender—Female	0.063[b]	0.004	0.004	0.8043413	0.001
Traditional student status	0.066[c]	0.004	0.004	0.8041826	0.000

For the Social Presence Subscale, the aggregate mean was 4.274 with a standard deviation of 0.682.

Forward method linear regression resulted in three of the variables being statistically significant predictors of the criterion variable (the aggregate mean of social presence indicators) (Table 4).

Table 4.
Forward method linear regression predictors of the criterion variable: social presence

	Unstandardized		Standardized		
	B	Std. error	Beta	*T*	Sig.
Constant	4.322	0.005		845.706	0.000
Ethnicity—Caucasian	−0.072	0.005	−0.046	−14.748	0.000
Traditional Student Status	−0.051	0.006	−0.025	−8.044	0.000
Gender—Female	0.017	0.005	0.012	3.827	0.000

The relative contributions of each of the predictor variables to the significant predictive model are listed in the Model Summary below. The *Forward* method in SPSS enters predictor variables one by one in order of decreasing significance. Table 5, therefore, illustrates the changes in Adjusted R^2, for the significant predictors of the criterion variable, as each variable is entered:

Table 5.
Adjusted R^2 for the predictors of the criterion variable: social presence

Model	*R*	R^2	Adjusted R^2	Standard error of the estimate	R^2 change
Ethnicity—Caucasian	0.045[a]	0.002	0.002	0.6814105	0.002
Traditional student status	0.053[b]	0.003	0.003	0.6811721	0.001
Gender—Female	0.054[c]	0.003	0.003	0.6811270	0.000

For the Cognitive Presence subscale, the aggregate mean was 4.313 with a standard deviation of 0.704.

Forward method linear regression resulted in four of the variables being statistically significant predictors of the criterion variable (the aggregate mean of cognitive presence indicators) (Table 6).

Table 6.
Forward method linear regression predictors of the criterion variable: cognitive presence

	Unstandardized		Standardized		
	B	Std. error	Beta	*t*	Sig.
Constant	4.356	0.007		609.823	0.000
Ethnicity—Caucasian	−0.077	0.007	−0.048	−11.336	0.000
Traditional Student Status	−0.072	0.007	−0.035	−11.086	0.000
Gender—Female	0.040	0.005	0.026	8.415	0.000
Ethnicity—Black	−0.022	0.009	−0.011	−2.598	0.009

The relative contributions of each of the predictor variables to the significant predictive model are listed in the Model Summary below. The *Forward* method in SPSS enters predictor variables one by one in order of decreasing significance. Table 7, therefore, illustrates the changes in Adjusted R^2, for the significant predictors of the criterion variable, as each variable is entered:

Table 7.
Adjusted R^2 for the predictors of the criterion variable: cognitive presence

Model	R	R^2	Adjusted R^2	Standard error of the estimate	R^2 change
Ethnicity—Caucasian	0.039[a]	0.002	0.002	0.7030779	0.002
Traditional Student Status	0.054[b]	0.003	0.003	0.7025856	0.001
Gender—Female	0.060[c]	0.004	0.004	0.7023391	0.001
Ethnicity—Black	0.061[d]	0.004	0.004	0.7023195	0.000

Scholarly Significance

Of all areas tested, analyses of the data showed a significant relationship between student demographics and CoI presences (social, teaching, and cognitive) in four areas. The variables of Ethnicity—Caucasian, Age—Traditional student status, Gender—Female, and Ethnicity—Black were significant. All other variables, Ethnicity—Hispanic, Ethnicity—Asian, Age—Non-traditional student status, and Gender—Male were found to have no significant relationship with CoI presences.

Specifically, for the Teacher Presence the variables of Ethnicity—Caucasian, Gender—Female, and Age—Traditional student status were found to be significant. The same three variables were determined to have a significant relationship for Social Presence. Lastly, for Cognitive Presence, there were four variables found to have a significant relationship: Ethnicity—Caucasian, Gender—Female, Age—traditional student status, and Ethnicity—Black.

However, the relevance of significance was limited since variance accounted for by the predictor variables was so small as to have no practical implication. Even though significance was found through analysis of the data in certain variables, though with a very small amount of variance accounted for in the predictor variables (student demographic characteristics), a theme that is so pervasive in the general literature is not significant in this study.

Review of the literature has shown that student demographics are a factor in a students' academic success. Engagement, satisfaction, and academic achievement, including persistence and matriculation, have been tied to certain student demographics, especially age, gender, and ethnicity (Astin 1993; Gonyea et al. 2006; Kuh 2007; Kuh et al. 2000; Pascarella and Terenzini 1991; 2005; Tinto 1993). The preponderance of the literature stems from research on traditional brick and mortar institutions. Whereas other colleges and universities, both two- and four-year, will report a relationship between academically purposeful activities, satisfaction, and engagement with some set of student demographic variables (i.e., NSSE and CCSSE survey results), there is no meaningful relationship between variables at this particular institution. This, in itself, is very significant. No demographic variable, within a large sample, was found to have a meaningful relationship to any of the three CoI presences, hence no connection to learning constructs and overall student satisfaction and engagement.

Further research is warranted to investigate these findings. Though the data were derived from a large sample and taken from the results of classes across curricula, recommendations for a

repeat of the study may be beneficial. If no further meaningful relationships can be found between student demographic characteristics and the three CoI presences, other factors would need to be examined. The prior study (Gibson, Kupczynski, and Ice 2010) testing the relationship between student demographics and end-of-course GPA at the same online institution also found no relationship. With demographic characteristics playing no role in end-of-course GPA or in satisfaction and learning constructs (i.e., CoI presences) perhaps curriculum and instruction, specifically the construct of the course and pedagogical and andrologogical methods employed, may be a factor in evening out the student demographics or may factor into student satisfaction and learning.

The overwhelming majority of non-traditional students may also be an aspect of the institution worth investigating. A school with over 90% non-traditional age students may possibly have a different culture of learning. Also, and not a variable tested in this study, the large number of military and military affiliated students may also have an impact on results of testing. Further, the overall effect of a fully online university is not known. Further studies must be performed to explore the dynamics of such institutions of learning.

Directions for Future Study

Further research is warranted to investigate predictors such as student demographics and their relationship to student success in an online environment. This study provides connections to the current body of literature as well as produces results that will help begin to fill the void in current research in online learning. Establishing that there may indeed be no connect with the three CoI presences and student demographic characteristics illuminates an additional component to working with students in an online community. Additionally, such information may influence initiatives designed to decrease attrition. A one-size-fits-all policy does not prove valuable.

Through development of learning constructs, engagement, satisfaction, and achievement, students can obtain success in college. Understanding the predictors that increase student academic achievement and the issues that prevent student persistence and matriculation is imperative for institutions to survive. Continually striving to serve the student, from research and then application of best practices through policies and initiatives, is the goal for every educator. Online learning is continually evolving. Continued success for students, especially at colleges and universities experiencing explosive, even hyper, growth is critical. Determining methods and techniques to increase student success is essential.

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References

Aragon, S.R., and E.S. Johnson. 2008. "Factors Influencing Completion and Noncompletion of Community College Online Courses." *American Journal of Distance Education*, 22 (3): 146-158. doi: 10.1080/08923640802239962

Arbaugh, B., M. Cleveland-Innes, S. Diaz, R. Garrison, P. Ice, J. Richardson, P. Shea, and K. Swan. 2008. "Community of Inquiry Framework: Validation and Instrument Development." *13th Annual Sloan-C Conference*. Orlando, FL.

Astin, A. 1993. *What Matters in College: Four Critical Years Revisited.* San Francisco: Jossey Bass.

Barefoot, B.O. 2000. "The First-Year Experience." *About Campus* 4 (6): 12-18.

Braxton, J.M. 2000. "Reworking the Student Departure Puzzle." In *Reworking the Student Departure Puzzle*, ed. J.M. Braxton. Nashville, TN: Vanderbilt University.

Bush, R., P. Castelli, P. Lowry, and M. Cole. 2010. "The Importance of Teaching Presence in Online and Hybrid Classrooms." *Allied Academies International Conference: Proceedings of the Academy of Educational Leadership (AEL)*, 15 (1): 7-13. Retrieved from EBSCO*host*.

Chickering, A.W., and Z.F. Gamson. 1987. Seven principles for good practice in undergraduate education. *American Association Higher Education Bulletin*

39 (7): 3-7.

Chickering, A.W., and Z.F. Gamson, eds.. 1991. "Applying the Seven Principles for Good Practice in Undergraduate Education." In *New Directions for Teaching and Learning*, No. 47: 63-69. San Francisco: Jossey-Bass Inc., Publishers.

Cohen, J., P. Cohen, S. West, and L. Aiken. 2002. *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*, Third Edition. Mahwah, NJ: Lawrence Erlbaum.

Field, A. 2005. *Discovering Statistics Using SPSS: Introducing Statistical Methods Series*, Second Edition. London: SAGE Publications Ltd.

Garrison, D.R., T. Anderson, and W. Archer. 2000. "Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education." *The Internet and Higher Education* 2 (2–3): 87-105.

Gibson, A.M., L. Kupczynski, and P. Ice. 2010. "Student Success in top 20 Courses of an Online Institution: Demographic Differences in a Multi-Semester Cross-Curricular Study." *i-manager's Journal of Educational Technology* 7 (2).

Gonyea, R.M., G.D. Kuh, J. Kinzie, T. Cruce, and T. Nelson Laird. 2006, November. "The Influence of High School Engagement and Pre-College Expectations on First-Year Student Engagement and Self-reporting Learning Outcomes at Liberal Arts Institutions." Presented at the *Meeting of the Association for the Study of Higher Education*, Anaheim, CA.
http://nsse.iub.edu/pdf/conference_presentations/2006/Expectations%20and%20Engagement%20ASHE%202006%20Gonyea%20Kuh%20Kinzie.pdf.

Green, S.B. 1991. "How Many Subjects Does it Take to do a Regression Analysis?" *Multivariate Behavioral Research* 26: 499-510.

Greer, J. 2010, January. "Study: Online Education Continues its Meteoric Growth." U.S. News and World Report. http://www.usnews.com/education/online-education/articles/2010/01/26/study-online-education-continues-its-meteoric-growth.html.

Ice, P., and L. Kupczynski. 2009, February. "Student Perceptions of Group and Individualized Feedback in Online Courses." Paper Presented at the *Meeting of the Southwest Educational Research Association*, San Antonio, TX.

Kinzie, J. 2009, June. "Using NSSE Results to Foster Collaboration on Assessment and Retention." Paper presented at the *Meeting of the NASPA IARC Conference*, New Orleans, LA. http://cpr.iub.edu/uploads/NASPA%20IARC%202009%20Using%20NSSE%20Partnerships%20handouts.pdf.

Kuh, G.D. 2007. "What Student Engagement Data Tell us About College Readiness." *PeerReview* 9 (1), 4-8.

Kuh, G.D., T.M. Cruce, R. Shoup, J. Kinzie, and R.M. Gonyea. 2008. "Unmasking the Effects of Student Engagement on First-Year College Grades and Persistence." *The Journal of Higher Education* 79 (5), 540-563.

Marklein, M.B. 2005. "College 'Swirling' Muddies Quality." *USA Today Life,* 6D.

McCabe, R. 2000. "Under Prepared Students." Measuring Up 2000: The State by State Report Card for Higher Education. http://measuringup.highereducation.org/2000/articles/underpreparedstudents.cfm.

Muilenburg, L.Y., and Z.L. Berge. 2005. "Student Barriers to Online Learning: A Factor Analytic Atudy." *Distance Education* 26 (1): 29-48. doi:10.1080/01587910500081269

Nelson Laird, T.F., B.K. Bridges, M.S. Holmes, C.L. Morelon, and J. M. Williams. 2004. "African American and Hispanic Student Engagement at Minority Serving and Predominantly White Institutions." Paper Presented at the *Meeting of the Association for the Study of Higher Education*, Kansas City, MO, November.

Pascarella, E.T., and P.T. Terenzini. 1991. *How College Affects Students: Findings and Insights from Twenty Years of Research.* San Francisco: Jossey-Bass.

Pascarella, E.T., and P.T. Terenzini. 2005. *How College Affects Students: A Third Decade of Research.* San Francisco: Jossey-Bass.

Swan, K., J.C. Richardson, P. Ice, D.R. Garrison, M. Cleveland-Innes, and J.B. Arbaugh. 2008. "Validating a Measurement Tool of Presence in Online Communities of Inquiry." *eMentor* 24I (2). http://www.e-mentor.edu.pl/artykul_v2.php?numer=24&id=543.

Tinto, V. 1993. *Leaving College: Rethinking the Causes and Cures of Student Attrition*, Second Edition. Chicago: The University of Chicago Press.

Tinto, V. 2004. *Student Retention and Graduation: Facing the Truth, Living with the consequences.* http://www.pellinstitute.org/tinto/TintoOccasionalPaperRetention.pdf.

Assessing Virtual Students' Quiz Performance in Web-Mediated Synchronous Instruction

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Abstract
Differences in teaching presence between virtual and traditional venues for a synchronous public budgeting class are examined by comparing the results of lecture-based quizzes. Previous studies, usually based on surveys, have focused on multiple aspects of virtual learners' experiences through the community of inquiry model. This research emphasizes virtual learners' ability to absorb lectures through web-mediated broadcasts, hosted via a commercial product. Statistical analysis indicated slightly poorer performance by virtual attendees, but with the impact limited narrowly to certain lecture topics. Ancillary uses of the broadcasts are also described, including enhancement of an asynchronous online budgeting class using recorded lectures.

KEY WORDS: teaching presence; synchronous distance education; videoconferencing; transactional distance; webinar

Introduction

The absence of significant differences found in student perception of and performance in online and face-to-face modes of instruction (Daymont & Blau, 2008) has puzzled those teachers who feel that something of the traditional classroom experience must be lost when mediated through the Internet. Under Moore's (1993) concept of "transactional distance," crucial factors separating instructor and student account for the engagement or disengagement of students. To surmount distance in the learning process the community of inquiry (CoI) framework (Garrison et al., 2000; Garrison & Archer, 2007) defines three categories of presence—social, cognitive, and teaching—to engage students.

Predominant application of this framework in studies of asynchronous online courses invites the exploration of CoI in a synchronous format. Garrison and Arbaugh (2007) note that "the increased ease with which media such as audio and video can be introduced into virtual learning environments may have significant implications for the structure, development, and interaction of the three presences" (p. 168). While technological advancement may encourage the type of course studied here by rectifying "limits on the technology current in academia," there remains the potential obstacle of educators feeling "that synchronous communication compromises the convenience and/or flexibility of asynchronous formats" (Arbaugh & Stelzer, 2003, p. 19). This research may help shed additional light on those concerns.

Aside from introduction of desktop videoconferencing technology, the public budgeting course at the heart of this research functioned very traditionally in most respects: modest-sized classes composed of degree-seeking students taught through predominantly lecture-based instruction. Voluntary attendance through web-mediated, synchronous broadcast of classes represented the only concession to the Internet age. But the commercial availability of affordable broadcasting technology (Furr & Ragsdale, 2002) suggests broader application in the

future for classes as traditional in other respects as this one. The possibility of reusing recorded broadcasts for a parallel (asynchronous) online section of public budgeting was another inducement for launching the grant-based project, though the results of the online course are secondary here. The key rationale for this research is the narrow focus on teaching presence, in particular the *direct instruction* component.

The rationale for this study is based on the recent cost-effectiveness of technologies such as web-based broadcasting, which lower the barriers to reaching virtual attendees synchronously. At the same time, unabated proliferation of online education, involving more than 6 million students, which exceeds 30 percent of the total enrollment in postsecondary, degree-granting institutions, as reflected in biennial national surveys (Allen & Seaman, 2011, p. 11), creates new demand for web-based instruction. One possibility for meeting this demand could be virtual availability of largely traditional courses, such as the subject of this study. In that case better understanding of the promise and potential drawbacks of such offerings can contribute to more intelligent use of this technology.

Literature Review

Research into transactional distance (Moore, 1993) and the closely allied literature on transactional presence (Naylor & Wilson, 2009; Shin, 2002, 2003) have identified the challenges of extending instructor-student and peer relationships found in highly functional traditional classrooms to online students. Yet many elements of instruction, including structure, materials, accessibility, student participation, peer connectedness, autonomous reflection, and other factors that influence the effectiveness of both online and traditional classes tend to engage or disengage distance students, just as they do face-to-face students. Mirroring this multifaceted learning process, the integrated nature of the CoI framework (Garrison et al., 2000; Garrison & Archer, 2007), poses a particular challenge in focusing on a single element. Nevertheless, this research seeks to zero in on the teaching presence category, largely focused on direct instruction. This emphasis on the ability to communicate the classroom experience to virtual students attending synchronously tests the premise that some aspects of direct instruction may be less effective for students who access audiovisual content at scattered locations through a less robust medium (the Internet) than dedicated videoconferencing networks or interactive television.

This research aligns most closely with studies of differences in achievement between students in online versus traditional formats (Arbaugh & Stelzer, 2003; Daymont & Blau, 2008; Friday et al., 2006; Hiltz et al., 2000; Summers et. al., 2005). The key distinction here is the seemingly minimal difference between the content available to virtual and in-person students. The question of how well educational content is conveyed by an audio-visual medium, initially television (Schramm, 1962), has been largely resolved, with prevalent findings of no significant difference between face-to-face and remote students' performance (Saba, 2000; Arbaugh & Stelzer, 2003). Yet research into virtual students' learning process under a synchronous format is needed, particularly in view of scant interest in this format revealed in a study of management education (Stelzer et al., 2002). When research has explored learning in a synchronous format, the prevalent technologies have been dedicated (as opposed to web-based) videoconferencing and interactive television (Skopek & Schuhmann, 2008), which benefit from fixed, extensively supported infrastructure and may yield different experiences as compared with experimental conditions accompanying trials of an emerging web-based technology.

Previous studies have focused on diffuse aspects of virtual learners' engagement in their education (Marks & al., 2005). Research examining CoI's social presence dimension of students' involvement in the learning process usually has been survey-based (see, for example, Williams et al., 2006). It has established meaningful interaction as a prerequisite for other dimensions fully functioning and assigned that responsibility to instructors (Swan & Shea, 2005). Recognizing the essential nature of social presence, this research nonetheless deemphasizes that dimension of the CoI framework by focusing on the instructor's role in directly conveying the knowledge that students need to absorb. Even the higher-order integration of concepts, an emphasis of CoI's cognitive presence dimension, is less central to this research because of the quite straightforward nature of the knowledge conveyed. Although greater integration of CoI dimensions is sought (Garrison & Arbaugh, 2007) and is admittedly crucial, this research represents a limited rather than a broad inquiry into the resilience of teaching presence through the web-mediated broadcast.

The particular focus on teaching presence separates this inquiry from previous studies based on a synchronous format, which examined students' performance in multiple dimensions (Clouse & Evans, 2003) or looked broadly at issues of satisfaction, accomplishment (self-reported), and accessibility (Skopek & Schuhmann, 2007). Such broad-gauge research encompasses many elements of learning-based models and involves cross-cutting influences. In contrast, the structure of this course, described in detail below, served to segment the information that was conveyed primarily through lectures, which was the basis for the assessment of student performance. In this way learning that relied on direct instruction could be separately evaluated, apart from the more integrated (and more crucial, from a pedagogical standpoint) learning that occurred in the applied portion of the course, which constituted its core.

Methodology

The public budgeting course I taught scarcely could be called a hybrid offering, since students could choose, as a sizeable minority did, to attend the class entirely in person. (But the recording of broadcast lectures did make possible the hybridization of an online public budgeting section taught in parallel, as addressed in the penultimate section.) Another unconventional aspect of this design was the lack of a requirement to select a mode of attendance. Students could attend virtually in one class and in person the next, which meant that the virtual and in-person groups were constituted differently from week to week. This mingling of the categories dampened some of the differences that have characterized virtual students in previous research. Departing from the traditional classroom experience minimally—only in providing the option of a web-based medium—served to narrow the factors under consideration. Limiting the outcome of interest to students' achievement on lecture-based quizzes further restricted the inquiry.

Students physically located at home, at work, in libraries, or at other access points, rather than collocated with other students—as is the case for satellite sites linked by dedicated networks, confront different challenges in absorbing traditionally delivered lecture material. For example, virtual students may be subject to distractions far beyond those posed by the classroom. Mechanisms bundled with the software, such as polling, provide the capacity to assess the presence and engagement of virtual attendees, but these would require a greater investment in mastering the technology than this trial required. Indeed, impact on the instructor was kept to a minimum, consistent with the modest level of investments in infrastructure and software. Rather than suggesting this course as a model for distance education, the introduction of web-based broadcasting here tested the feasibility of an affordable, portable configuration for a modestly

technically proficient instructor and students who place a high value on convenient access, a crucial motivation for choosing distance education (for example, see Wyatt, 2005).

The single-course research design requires justification, since this design has been deemphasized during the last 15 years of distance education studies in favor of multi-course studies (Arbaugh et al., 2010, p. 46). The author's public budgeting course had attributes, addressed below, that lent itself to an emphasis on teaching presence. Expansion of the study to include other instructors, however, would have contributed to more generalizable findings. The primary reason for an exclusive focus on my course was that the software solution was unavailable to others, because the specially licensed platform was external to the university's instructional technology plant and available initially through an individual instructor license. The cost of this software and accompanying service was funded by a one-time grant.[1]

The stand-alone technology platform was integral to the research, as well as to the hardware/software trial, which was the genesis for the research. The idea of evaluating a modestly priced web-based broadcasting solution, which was viable for a small number of instructors, even a single instructor, is consistent with the diffusion of innovation theory (Rogers, 2003), which suggests that early adopters usually lead general adoption of new technology by a significant interval: the "S-shaped" pattern of adoption (p. 275). Relatively few universities have the resources to provide universal web-conferencing infrastructure. Even for universities where such an investment is possible, much of the infrastructure could be expected to be wasted initially, given the necessity to build critical mass before the technology can achieve widespread acceptance.

Another crucial reason for integrating web-based broadcasting into this traditional public budgeting course was the dissemination of recorded lectures to students in an online section of the same class. Although the resultant blending of face-to-face and online instruction is not the main focus of this research, the goal of going beyond a text-based format for the online section was an important rationale for experimenting with the webinar technology. Informal feedback on the utility of recorded lectures is provided below, following the quantitative results.

Technical Solution

The core component of the technical solution was the proprietary software and service obtained from Elluminate (currently Blackboard Collaborate) that provided "webinar" capability.

The other elements, which constituted a portable hardware solution (installed prior to each class), did not add to the cost of the project: either being owned by the instructor or furnished by the University's Office of Technology Support. Even the most elaborate hardware configuration used for this research could have been purchased for approximately $2,000. Software consisted largely of Microsoft Office products, such as PowerPoint, used to populate the "whiteboard" images—displayed for virtual and in-person attendees—around which lectures were organized. Microsoft Excel underlay the computations and analysis for the applied financial assignments, but seldom was employed in the salient portion of the lectures, which dealt with contextual and political issues. Table 1 shows how the hardware used with Elluminate evolved. The progression to successively more complex configurations over three semesters, before reducing the hardware to a web camera and wireless keyboard/mouse for the last semester, represented a largely unsuccessful attempt to capture class discussion in a manner audible to virtual attendees.

Table 1.
Technical Solution by Semester

Semester	Hardware Configuration	Webinar Software/Service
1st	Classroom computer; wireless microphone; web camera; wireless mouse tablet	Elluminate Live, Version 9
2nd	Classroom computer; wireless microphone; web camera; second computer; wireless mouse and keyboard	Elluminate Live, Version 9
3rd	Same as second semester (above)	Elluminate Live, Version 10
4th	Web camera; wireless mouse and keyboard	Elluminate Live, Version 10

Despite the different hardware configurations, it was seldom possible for virtual attendees to fully hear questions and exchanges by other students. Due to the difficulties of managing multiple speakers through Elluminate and network limitations, virtual attendees "chatted" rather than spoke their questions and comments, so their input was always visible. The instructor was generally audible, barring network issues. But students' questions could only be heard clearly outside the classroom to the extent they spoke up considerably and were located in reasonable proximity to the microphone, roughly the front half of the class. Early on, one tactic to broadcast classroom discussion was for the instructor (wearing a microphone during that phase of the trial) to move physically closer to the speakers when extended discussion occurred. But most of the students very briefly requested clarifications or examples from the instructor or gave relatively short answers to the instructors' questions, which did not allow enough time to approach them.

An unintended consequence of the changing hardware configurations was the added complexity and the associated risk of failures. Table 2 lists the most common technical issues, illustrating the degree to which the instructor, as technician, had to be involved with minimizing problems with the infrastructure. The simplest configuration was ultimately chosen (in the fourth semester), using the stationary microphone capability of the web camera, which featured zone-oriented audio pickup. This solution effectively covered the front half of the room, with minimal impact on hearing the instructor and enhanced capacity to make out some of the comments and questions from students whose voices projected. This configuration's reliability and ease of weekly setup and management during class represented the most workable solution, as well as the most affordable (had the equipment not already been purchased). Nevertheless, performance tradeoffs included brief inaudible intervals and the unconventional camera angle, which faced the students rather than the instructor.

Table 2.
Selected Technical Challenges Encountered Using Elluminate with Minimal Support

Issue Type	Frequency	Problem Detection	Solution Description
Network interruption	Multiple times per class, at interval of one to two hours	Message says "attempting to reconnect."	If automatically (usual case) reconnected, take no action. In case of "reconnect failed" message, close virtual classroom window. Then, go to Elluminate start window in browser and reload.
Audio/video interruption	Approximately half of classes	After network interruption, "chat" panel in the virtual classroom window says "Left at [time]" then "Joined at [time]."	Activate "talk" button to resume audio transmission. Select "stop" button for video transmission, then activate "video" button to resume transmission.
Microphone interruption	Approximately half of classes	Message says "fatal error" and "audio input failed"; watch for "stop sign" icon.	Switch audio input to alternate source; then switch back. Activate "talk" button again to resume audio transmission.
Second computer failure	Once-twice per semester	Eluminate screen frozen—slides not advancing; volume "bars" on audio not moving.	Switch to primary computer, using stationary, hard-wired microphone. Conduct virtual class without video.

The issues listed in Table 2 do not exhaust the problems encountered using Elluminate. Others, primarily classifiable as operator errors, such as not initiating the recording feature or forgetting to activate the "talk" button, were usually rectified quickly, once alert students or the instructor noticed the omission. This should not be interpreted as a negative assessment of the Elluminate product or other elements of the technical solution. The crucial point is that technical issues are almost an inevitable byproduct of non-production installations, with the accompanying absence of dedicated technical support, and must be anticipated. Instructor time and attention siphoned away from pedagogy by technical problems that arose and the workarounds they necessitated (including non-technical responses, such as repeating material for virtual students who missed it due to interruptions) set up a tradeoff, to be weighed against the convenience for students of extending education beyond classroom walls.

Course Design

Another facet of the research design was the control of instructor-related variables that can bedevil multi-course studies. Whereas limiting the study to a single instructor made the research more idiosyncratic, a compensating advantage was to control for varying instructional techniques. A final justification for selection of this instructor/course combination for studying web-broadcasting technology is the relative ease with which the experimental design could be adapted to this course. The public budgeting course had been designed, prior to the infusion of technology, to address two largely disjoint themes. This bifurcation was an artifact of instructor choice, as well as the practical focus of the curriculum. But the resulting division of context from application, as an organizing principle of the course, was the basis for the statistical test of the contextual topics alone—virtually entirely dependent upon lecture and class discussion.

The University's strong practitioner emphasis, as manifested in the Master of Public Administration (MPA) degree, meant downplaying the political and contextual dimensions of public budgeting. As a result this course's emphasis was split quite unevenly between budgetary application at the core and context and politics on the margins. Since the former counted for the greater proportion of the grade by far, students had a strong incentive to be engaged during the second half of each 150-minute class, when the applied financial assignments were explained and related examples worked. The first half of these classes, when budgetary context and politics were discussed, held intrinsic interest for a number of the students (and the instructor), but provided scant extrinsic motivation for engagement. Accordingly, a lecture-based quiz on one or two of the main points covered in the first half of the class was always given at the halfway point. The weekly quiz, which did not involve assigned reading beyond the lecture material, was incorporated into the original course design, preceding the virtual attendance option. Table 3 illustrates the difference between contextual and political topics covered in the first half of each class versus the applied topics in the latter half.

Table 3.
Contextual and Political Topics versus Applied Topics in Public Budgeting Course

Module	Contextual/Political Topic Examples	Applied Topic Examples
Budgetary context	Theoretical and political distinctions between public and private goods	Distribution of state & local revenue sources and spending allocations
Budget structure	Line-item, programmatic, and performance-based budgeting paradigms	Limits of fund accounting and line-item budgeting in cutback scenarios
Budget preparation and execution	Incremental, rational budgetary theories; budget projection and analysis methods	Multi-year patterns in budgetary baseline and variance analyses
Capital budgeting	Time value of money, present value, and their implications for capital budgets	Cost-benefit analysis
Revenue sources	Taxation equity, incidence, and efficacy	State multi-year revenue analysis

Quiz grades constituted an extra-credit rather than averaged-in portion of the overall grade, with the preponderance of grades in the course based on the applied financial assignments, which emphasized computing, reasoning, and writing proficiency. Quiz grades served to "upgrade" the results of financial assignments, with the effect that virtually all students who maintained at least "B" grades on all financial assignments earned "A" grades in the course. Students who received grades of at least "A-" on all financial assignments also earned "A" grades in the course; for them quiz grades were irrelevant. Only students who attended received quizzes: handed out in class and, nearly simultaneously, emailed to virtual attendees. Quiz distribution was timed to coincide with a 15-minute break, roughly halfway through the class period lasting two and one-half hours. Fifteen minutes was considered ample time to answer one or two questions, usually multiple choice. An "open-book, open-web" policy and relatively easy questions—a large majority of students answered both correctly for "A" grades—contributed to the low-stakes testing regime and discouraged cheating: effectively limited to the sharing of answers, and yielding little prospect of gain. These details do not serve to exemplify or justify an unorthodox grading policy, but to emphasize that the quiz was a relatively minor attendance-enforcing device, gauging students' general grasp of the lecture material and related discussion.

Data

Within the four semesters, the middle portion of the course served as the sample, omitting the initial three and last three classes in a 14-week semester. The rationale for leaving out quizzes administered during the initial classes was that explaining the option for web-based attendance, covering the logistics of attending remotely, and assembling a reasonable number (three or more) of virtual attendees generally occupied the first three classes. Delaying measurement also allowed for the learning curves of both attending virtually and taking quizzes. The rationale for omitting classes late in the semester is an artifact of the grading policy, which mandated attendance of 10 classes. After the required 10 attendances, completed quizzes were assigned grades of "A" automatically. Another atypical facet of end-of-semester classes was the scheduling of guest lectures, when no quizzes were administered.

A total of 88 students participated in the four sections of the public budgeting course, accounting for 567 total attendances. One important difference with previous research is that the groups of students attending face-to-face and attending virtually are not discrete. Approximately half the students attended in both modes, with most of those choosing a single mode opting for face-to-face attendance (36 percent of all students), versus 14 percent selecting entirely virtual attendance. For the 50 percent of the class attending both virtually and face-to-face, the median number of virtual attendances was three (3) and the mean was 3.8.

The implication of these patterns of attendance is that the populations of virtual and face-to-face attendees were intermingled substantially. Dual-mode attendees accounted for 42 percent of the quizzes administered in person and 64 percent of the virtual quizzes. The mixing of these populations tended to dampen effects reflecting the characteristics of early-adopting students, since deliberate and even cautious adopters were also included among the virtual attendees. The in-person attendances, with the majority (58 percent) being attributable to solely in-person attendees, were potentially more representative of late-adopting attributes. But other reasons could contribute to exclusively in-person attendance, such as the scheduling of other on-campus activities in proximity to the budgeting class (including consecutive classes, quite common since MPA classes were offered primarily in the evenings).

Dependent Variable

Quiz grades serve as the dependent variable, normalized for relative performance using ordinal values. Students earning the highest grade on a particular quiz, always an "A," were assigned a value of four (4). The next-highest grade, which varied from "B" to "A-," resulted in an assigned value of three (3), and so forth to the lowest grades, which resulted in assigned values ranging from two (2) to zero (0): with none of the quizzes producing more than five grade levels. Normalizing the grading distribution preserved the order of student performance, which more closely tracked the phenomenon of interest. Selection of a categorical dependent variable necessitated use of ordinal logistic regression, as opposed to multiple regression, which assumes a normal distribution for the dependent variable.

Quizzes usually included two questions, composed of true-false or multiple choice types, sometimes requiring a brief explanation to support the student's selection. Quizzes were intended to be confirmatory, reinforcing points emphasized during lectures, rather than challenging students to integrate concepts. Accordingly, the distribution of quiz grades was skewed toward the highest grade, with nearly 70 percent of quizzes graded "A."

Independent Variables

Three sources of independent variables were employed to explain students' performance on lecture-based quizzes. One explanatory variable, based on students' ability, has been used often in research on the effectiveness of online instruction. For this research measurement of ability was provided by the grade point average (GPA) on applied financial assignments, which were the primary contributors to the overall course grade. Recall that quiz performance was used as an extra-credit component of the overall grade, which tended to help students with poor to good performance on the financial assignments, but not excellent performers. Applied financial assignments drew upon a general knowledge base, since the emphasis in grading these was on computing, reasoning, and writing proficiency, rather than the contextual and political aspects of budgeting, which were the basis for quizzes. Given the largely disjoint bodies of knowledge for these two components of the overall grade, sufficient independence was maintained and multi-collinearity avoided, so that the common element that applied to both the financial assignments and the quizzes was students' basic scholastic acumen.

Another factor that applied to this use of broadcasting technology is the attendance mode, in-person or virtual. This variable supported an examination of virtual students' absorption of lecture material on budgetary politics and context, as compared to students attending in person. Because of the synchronous broadcast, the previously identified advantages of distance education, such as time for reflection, did not apply in this instance. Neither group of students had an advantage in resources, since the course was scheduled for a laboratory classroom, providing in-person students with computers. The laboratory was assigned because of extensive use of Excel for the applied financial assignments. Internet access was permitted in completing quizzes.

In the absence of additional time or resources available to virtual students, the salient mechanisms appear to be the transmission capacity—to broadcast the lecture content faithfully—and the comparative levels of distraction inside and outside the classroom setting. In both cases the effects can be expected to reduce virtual student performance. The standard for effectiveness of transmission is to provide an equivalent experience to in-person attendance. The sources of subpar transmission included component limitations, for example the inability of virtual students to hear clearly the questions posed by students in class; operator error, such as the instructor's failure to turn on the microphone; and a multitude of possible hardware or software failures, such as the interruption of the signal between the classroom computer and the network (see Table 2). The only plausible elements of a superior experience from transmission would involve aids such as closed captioning, which were not provided in this case. With regard to potential distractions, the instructor exercised a large degree of control over the classroom environment, but lacked comparable control over the virtual environment—accordingly presumed to vary considerably.

The remaining factors revolved around the issue of experience. Two of the independent variables involved the experience with quizzes: one with the sequence of the quiz within the semester (first through eighth); and the other with the number of virtual quizzes taken previously. Both of these variables could be expected to contribute to student performance, by increasing students' familiarity with the quiz format in the former case, and increasing students'

facility with the virtual environment in the latter case. The final variable measured the instructor's experience with the technology, which could be expected to increase with use of the webinar service in each successive semester. Such learning might have been enhanced by reliance on a stable hardware configuration, but, as review of Table 1 shows, the technical solution was in flux, although use of Elluminate as the webinar service was a constant throughout the trial period.

Results

The statistical evidence of the model was provided through an ordered logistic regression, "ordered logit," which requires sequencing the dependent categorical variable. The ordered logit model produces coefficients that estimate the factor's impact on the likely value of the dependent variable, all other factors being held equal. The validity of ordered logistic regression is also based on the test of parallel lines, which relies on the assumption that the coefficient estimates do not vary significantly depending on the level of the dependent variable. This assumption was validated using a test of non-parallel lines. The result was failure to reject the null hypothesis (parallel lines) at the $p < .10$ level, with a significance value of .185.

Table 4 contains the results of the ordered logistic regression. The performance of the overall model is represented by χ^2 of 40.222, which establishes a significant difference ($p < .05$) between the model and the null hypothesis that all coefficients are zero. The amount of variation accounted for by the model is shown using McFadden, Cox and Snell, and Nagelkerke statistics, yielding values of .068, .081, and .038 respectively. Such values would be substandard levels for multiple regression. Unfortunately, these are not comparable metrics to R^2, which represents the proportion of variation accounted for by a multiple regression model (Long, 1997, pp. 104-106).

Two of the independent variables, *non-quiz GPA* and *attendance mode*, had significant associations with the dependent variable, *quiz grade*, which tended in opposite directions. The negative sign of the *non-quiz GPA* estimate is interpreted to mean that the shift to an adjacent grouping of average grades obtained on the financial assignments, for example from "A" (3.75 to 4) to "B+/A-" (3.25 to 3.74) or from "B+/A-" to "B" (2.75 to 3.24), was associated with diminished performance on the quiz. A countervailing relationship with *attendance mode* means that taking the quiz in class rather than virtually produced a positive result, though only about two-thirds as strong. To illustrate the combined relationship, a student with *non-quiz GPA* in the "A" range (3.75 to 4.00) who attended virtually was approximately four percent more likely (4%) to earn an "A" on the quiz than a student with *non-quiz GPA* in the "B+/A-" (3.25 to 3.74) range who attended in person. But the same virtual attendee was about eight percent less likely (-8%) to earn an "A" on the quiz than a student with an equivalent GPA who attended in person. Interpolation of these results indicates that achieving an equivalent outcome on a quiz required the virtual attendee to have superior academic ability: roughly comparable to a single-mark advantage: "A" (virtual) to "A-" (in-person); "A-" (virtual) to "B+" (in-person); and so forth.

Table 4.
Results of Ordered Logistic Regression

N	Pseudo R-Square	Log Likelihood (null model)	Log Likelihood (fitted model)	Chi-Square	Degrees of Freedom	Model Significance
567	Cox & Snell .068 Nagelkerke .081 McFadden .038	861.008	820.786	40.222	24	.020
Variable/Category		Percentage in Category	Coefficient Estimate	Standard Error	Wald Statistic	Variable Significance
Attendance mode						
Virtual (*no estimate)		37.2%				
In-person		62.8%	.496	0.247	4.032	.045
Non-quiz GPA						
A (*no estimate)		29.5%				
B+ to A-		38.6%	-0.721	0.255	7.972	.005
B		21.6%	-0.884	0.278	10.111	.001
C+ to B-		4.5%	-1.427	0.434	10.794	.001
C		2.3%	-0.977	0.612	2.548	.110
D+ to C-		2.3%	-1.327	0.633	4.394	.036
D		1.1%	-1.508	0.897	2.828	.093
Quiz sequence						
8th (*no estimate)		7.1%				
7th		9.9%	0.258	0.482	0.286	.592
6th		12.3%	-0.010	0.468	0.000	.983
5th		14.1%	-0.121	0.463	0.068	.794
4th		13.9%	0.184	0.469	0.153	.695
3rd		14.5%	0.136	0.463	0.086	.770
2nd		14.1%	0.329	0.476	0.479	.489
1st		14.1%	-0.141	0.476	0.087	.767
Virtual quiz experience						
7 (*no estimate)		0.4%				
6		1.4%	0.806	1.539	0.274	.601
5		3.0%	0.988	1.460	0.458	.499
4		3.9%	1.744	1.475	1.398	.237
3		5.1%	1.573	1.453	1.173	.279
2		9.2%	1.012	1.407	0.517	.472
1		12.3%	0.703	1.397	0.253	.615
0		64.7%	1.033	1.400	0.545	.460
Semester sequence						
4th (*no estimate)		23.9%				
3rd		27.3%	-0.212	0.274	0.599	.439
2nd		22.7%	0.314	0.295	1.133	.287
1st		26.1%	0.128	0.281	0.208	.648

* Highest value of each category corresponds with cumulative probability of 1, producing no coefficient.

Inspecting the Wald statistics in Table 4 shows that the associations of the *non-quiz GPA* with *quiz grade* were quite significant ($p < .01$) for the most common values, encompassing the "C+/B-" range and above, which accounted for nearly 95 percent of the sample. Lower Wald values and associated statistical significance for the "C" range and below are of minimal concern, given the very low frequencies in these categories. The association between *attendance mode* and *quiz grade* produced adequate statistical significance, at the $p < .05$ level. The direction of the relationship was in the anticipated direction, with in-person attendance associated with superior performance on the quiz.

None of the experience-based variables, including students' experience with the quiz format or virtual attendance or the instructor's experience with the technology platform, had any apparent association with outcomes. This lack of relationship among *quiz sequence, virtual quiz experience*, *semester sequence, and quiz grade* failed to demonstrate the anticipated impact of familiarity over time—a learning curve. The absence of experience as a factor materializing in the statistical results is surprising.

In view of diminished performance on the quizzes by virtual attendees, which were based on the portion of the lectures dealing with contextual and political facets of budget, the question arises about effective transmission of the remainder of the lecture, dealing with the mechanics of completing the financial assignments. Table 5 contains the results of a regression model relating absences and virtual attendance to the GPA on financial assignments. The model also included control variables, semester sequence and gender, although these had no effect. The level of virtual attendance had negligible association with GPA on financial assignments, which was the core performance metric for the course, while there was a slightly negative, marginally statistically significant ($p < 0.10$) association with absences: approximately one-tenth letter grade reduction in the grades on applied financial assignments per absence.

Table 5.
Results of Regression Model Relating GPA on Financial Assignments to Attendance Attributes

N	R^2	Adjusted R^2	F Value	P > F
88	.047	.001	1.027	.398
Variables	Coefficients	Std. Error	T statistic	Significance
(Constant)	3.413	N/A	N/A	N/A
Absences from class	-0.120	0.072	-1.666	*.099
Virtual attendances	-0.005	0.026	-0.199	.843
Gender (positive = female)	0.106	0.143	0.741	.461
Semester sequence	-0.025	0.059	-0.429	.669

* Significant at the $p < .1$ level.

Findings

The most important finding is the diminished teaching presence in conveying some of the lecture material to virtual students. While significant in the limited terms of this study, this finding does not generalize across applications of webinar technology to distance education for a number of

reasons. First, the lecture-based quiz is a somewhat idiosyncratic pedagogical choice, lending itself to testing a very narrow aspect of the educational experience. In comparison with the instantaneous feedback through quizzes, performance in the core focus of the course, the applied financial assignments, provided a more fundamental evaluation of the combined effectiveness of the lecture with other elements of the learning process. The enhanced presence in other facets of the CoI model—based on the ability to reflect; follow up aspects that were not initially understood, for example by email; and, most crucially, to submit drafts of the financial assignments—engaged students and the instructor in a much broader and more sustained way. The undifferentiated performance for the core of the course, the applied financial assignments, irrespective of students' mode of attendance demonstrates that the diverse means of obtaining and synthesizing knowledge made it possible to surmount apparent technological, environmental, or pedagogical limitations of web-based broadcasting to achieve the primary learning outcomes.

A quite surprising finding is the absence of a significant experiential factor. The clearest expectation was that learning through the experience of virtual attendance would contribute to absorption of lecture-based material more fully, manifested in superior quiz grades by habitual virtual attendees. But, as results in the preceding section showed, this was not the case. Possible explanations include an initial Hawthorne effect (Rainey, 2009, p. 34) followed by gradual diminution, as the novelty and distinction of participating in an experimental trial wore off. Thus, greater familiarity could have contributed to facility with the technology, at the same time that diminished interest or heightened impatience with technical issues detracted from the keenness with which students participated. This explanation is quite speculative, accounting for a single plausible reason, among many possibilities, for the observed failure to improve over time. Another potential rationale for the absence of an observable learning curve is that the webinar technology may have posed a low threshold of adaptation for technologically savvy students—considerably more experienced with audio-visual content delivered over the web than their instructor, of an earlier generation. Similarly, the quiz format itself may have presented a readily surmountable challenge, given the intended ease of this low-stakes testing mechanism, which would account for the lack of improvement by either category of attendees over the course of the semester. Finally, failure by the instructor to eliminate or even reduce the slight deficit in virtual student performance on the quizzes across four semesters may indicate the intractable nature of differences between the virtual and in-person environments. But the stubbornness of this result could equally plausibly indicate that the audio-visual quality issues noted by students using the recordings (see Table 6 below) remained problematic throughout the trial. This possibility is buttressed by the dynamism of the technology used from semester to semester (see Table 1). Changing the test environment admittedly detracted from the reliability of results, but did represent an accommodation of another purpose for this technology trial, which was to pursue a workable, cost-effective solution.

A secondary rationale for this trial of broadcasting technology was to reuse recordings of the face-to-face section of the public budgeting course as a supplement to the course's online section. Although access to the recorded lecture was asynchronous and in theory duplicated the textual material provided online, some students expressed a preference for reinforcing the material by watching the recording. The recordings were also furnished to students in the face-to-face section. Some of the comments students provided are contained in Table 6. There was no mechanism for comment without attribution, which could have limited negative reactions to the technology, although students appeared willing to share criticism as well as positive feedback.

Table 6
Selected Student Feedback on Recorded Lectures Provided Asynchronously to Online Sections

Semester	Student Comment
1st	Love it! This is my 1st experience with technology like this in an on-line course and it has immensely contributed to my grasp of the course content. In the past, I have preferred to take traditional lecture courses. I always felt that I got more out of a classroom setting especially with the instructor clarifying topics and delivering immediate feedback. That is one down side to the webinars. However, this is the next best thing and I feel as though I am getting everything a traditional course has to offer except the ability to ask questions.
1st	Some of the technical problems that I ran into involved the program stopping and restarting while the professor was talking. Also, I found it difficult to hear the class members talking and asking questions. If the class talked a lot I was unable to hear what most of them had to say. Perhaps, more microphones could be added throughout the class room so the audio is clear and easy to hear.
1st	I wish that there was a way that it could be more interactive as far as being able to have live chat attached with it. Outside of that the software is great.
1st	I can't really say anything about it because those types of webinars and broadcasts don't really help me because of my disability. So I don't see any benefit in this for me.
1st	One thing I would like to see added is a brief introduction and directions for the use of the webinars at the beginning of the course. This way people would understand up front the advantages to webinars and immediately start using the technology. I wish all my online courses had used webinars. I feel as though I have missed out by not having been able to take advantage of this technology earlier.
2nd	I liked the webinar recorded lectures, and I think that they are a good idea. However, at times your voice did not sound clear enough for me to understand and I believe that could be adjusted.
2nd	The webinars and broadcasts were a great supplement to the lecture notes provided through Webtycho. Besides the technical issues with the audio, I thought they were really good. I also liked the document sharing feature. I haven't had experience with a similar program in any of my other classes so I really do not have anything to compare the program to but I would recommend using again.
2nd	The webinars and broadcasts were useful for those who need more class lecture instruction. I did use them for clearer explanation on the assignments, although they were often fuzzy and long. Perhaps only recording those specific times when you are explaining material would be beneficial. I don't know how the recording function works but having the ability to hit record and stop throughout the lecture cuts out a lot of unnecessary "class" stuff.
2nd	I really don't have much experience with other similar software, but I do really appreciate that of all the online courses I've taken, there is finally something that allows for a lecture or interaction type atmosphere. The sound was a little difficult to hear sometimes…. Probably the most annoying aspect was the inability to "rewind" like you are able to fast forward. If I missed something and tried to go back, it often took awhile to reload the entire lecture, unless I was doing it wrong.

3rd	I enjoyed having the recorded lectures available. They helped clarify questions about the topics and added a "personal touch" to an otherwise impersonal online format. I only watched one lecture, but that was due to time constraints on my part…. Just be careful of camera position because sometimes you end up with a glare.
3rd	I think the recorded lectures were very helpful when I could hear what you were saying. The audio quality is very poor. I am currently trying to listen to the guest lecturer and cannot hear a word.
3rd	I thought the recorded lectures were a helpful tool that I could use. I only used them a couple of times when I was confused on the excel [financial] assignments, but they gave me some clarification and gave me a better understanding of the material.
4th	Apart from the flexibility that the Elluminate provides with accessing the lectures (which are quite long, I should note), it also made me feel related to the learning process as I realized that my questions on the material are shared with the other students. The only two problems I faced using this experimental project are the sound quality and logging in. There was a lot of background noise.
4th	I found it difficult to hear the audio recordings at times, making the lecture hard to follow. Otherwise I found the recordings to be a good way to reinforce lessons read online.
4th	My only complaint of the recorded lectures would be the sound quality. Sometimes I couldn't hear what was being said, or questions that were asked by students. But I do not know if this is the fault of the software or bad placement of the microphones.
4th	I think the lectures are helpful and the software is interesting but not necessarily user friendly. I would also have enjoyed the lectures more if I was looking at the front of the class instead of your back. If the camera could be relocated so as to give the viewer the experience of sitting at the back or middle of the class - facing front - then I think I would have been able to retain information better.

Discussion

The rationale for undertaking this research was the feasibility of a technical solution that only recently has become more affordable, and, thus, widely available. Any judgment about the advisability of localized, non-institutional implementation of web-mediated broadcasts is beyond the scope of this research. The preceding sections surfaced considerations bearing on the choice by individual instructors to pioneer this type of solution. Until the widespread availability of web-mediated distance education, both synchronous and asynchronous, is realized in the foreseeable future, such a choice will confront many educators, as we struggle to take advantage of technologies at hand to promote effective learning, while being less and less tied to a location.

The observed impact on at least one element of the CoI model, teaching presence, poses a serious issue to be confronted. Further research is needed to establish the extent to which the diminished presence noted here may generalize to other environments, particularly those where production-quality hardware, software, and technical support offer greater stability, reliability, and performance. Yet this research also revealed an apparent resilience in the learning process to the observed shortcomings in teaching presence, making it possible to overcome technological, pedagogical, or environmental deficiencies that appeared to prevent faithful re-creation of the

classroom experience over the Internet. Presumably by compensating in other dimensions of the CoI model, my students and I were able to leverage capacities beyond the scope of this research, such as email-based inquiries, review of drafts, reflection by solitary students, and discussion among peers, to equalize the results achieved by virtual and in-person attendees for the financial assignments, which constituted the core of the course.

The CoI framework has provided a meaningful assessment of the student experience in key facets of the learning process. This study extends that assessment by adding a performance dimension, whereas prior research has been overwhelmingly survey-based. The incorporation of synchronous learning also represents an extension for research rooted in the CoI framework. Yet the future path for studies examining the dimensions of CoI tends toward greater integration of the dimensions, rather than separately focusing on each dimension (Garrison & Arbaugh, 2007). Existence of an integrated, validated survey instrument (Swan et. al., 2008) supports this goal.

Incorporating quizzes such as those used here to assess a segment of student performance would pose a challenge in research employing a comprehensive CoI instrument. An idiosyncratic structure with an unusual grading policy supported use of targeted quizzes in my course, but that is hardly a reasonable choice in most courses. Nevertheless, there could be utility in establishing which elements within the integrated framework represent special challenges under a particular format and where the compensating strengths are drawn upon to mitigate those challenges. In this research, learning based on the synchronous virtual attendance of a traditional lecture apparently did not achieve quite the same level as the face-to-face equivalent. Presumably, non-lecture portions of the course compensated. But parsing the effects of interrelated elements of a learning model and their cross-cutting influences through surveying students seems to be a tall order. It is possible that technological tools beyond the scope of this research may play a role. Synchronously polling students, checking responses, and tracking the questions and reactions posted, all of which the technical solution used here supports, may provide granular data, able to complement multi-faceted surveys. However, the feasibility of this level of technical engagement by the instructor should not be underestimated.

The burdens placed on the instructor doubling as technician are real and palpable to students regardless of their mode of attendance. Dedicated technical support represents a crucial requirement to proceed to the next level of experimentation with webinar technology. Cautioning students about the experimental nature of the learning environment is another necessary step, as measuring outcomes would become virtually impossible to isolate from influencing outcomes. Whereas the tangible benefit, enjoyed by the majority of the students in this study, of avoiding the commute, at least once, to an inner-city university for an evening class seemed to compensate somewhat for the occasional technical misstep and contribute an overall positive reception of the trial, this was by no means an inevitable result. The line between technologically enhanced learning and gadgetry run amok is fuzzy and easy to cross. As web-mediated educational aids become more affordable and ubiquitous, this issue is likely to represent an ever greater concern for the mass of educators: most likely to be neither early- nor late-adopters of technology.

Notes

1. This research was supported by a grant from the Bank of America Center for Excellence in Teaching. A subsequent study funded by a follow-on grant encompasses courses taught by three instructors, each using a different commercial webinar service with extensive market presence.

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References

Allen, I. E., & Seaman, J. (2011). Going the distance: Online education in the United States, 2011. Babson Survey Research Group. http://sloanconsortium.org/publications/survey/going_distance_2011 [Accessed on June 18, 2012.]

Arbaugh, J. B., Desai, A., Rau, B., & Sridhar, B. S. (2010). A review of research on online and blended learning in the management disciplines: 1994–2009. *Organization Management Journal* 7(1): 39-55.

Arbaugh, J. B., & Stelzer, L. (2003). Learning and teaching management on the web: What do we know? In Wankel, C. & DeFillippi, R. (Eds.) *Educating managers with tomorrow's technologies* (pp. 17-51). Greenwich, CT: Information Age Publishing.

Clouse, S. F., & Evans, J. (2003). Graduate business students' performance with synchronous and asynchronous interaction e-learning methods. *Decision Sciences Journal of Innovative Education* 1(2): 181-202.

Daymont, T. & Blau, G. (2008). Student performance in online and traditional sections of an undergraduate management course. *Journal of Behavioral and Applied Management*, 9(3): 275–294.

Daymont, T., Blau, G., & Campbell, D. (2011). Deciding Between Traditional and Online Formats: Exploring the Role of Learning Advantages, Flexibility, and Compensatory Adaptation. *Journal of Behavioral and Applied Management*, 12(2), 156-175.

Friday, E., Friday-Stroud, S.S., Green, A.L. & Hill, A.Y. (2006). A multi-semester comparison of student performance between multiple traditional and online sections of two management courses. Journal of Behavioral and Applied Management, 8(1): 66–81.

Furr, P. F., & Ragsdale, R. G. (2002). Desktop video conferencing: How to avoid teacher and student frustration. *Education and Information Technology* 7 (4): 295-302.

Garrison, D. R., Anderson, T., & Archer,W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *Internet and Higher Education*, 2(2–3), 87–105.

Garrison, R. & Archer, W. (2007). A theory of community of inquiry. In M. G. Moore (Ed.), *Handbook of distance education*. Mahwah, NJ: Lawrence Erlbaum.

Garrison, D.R., & Arbaugh, J.B. (2007). Researching the community of inquiry framework: Review, issues, and future directions. *Internet and Higher Education* 10(3): 157–172.

Hiltz, S. R., Coppola, N., Rotter, N., Turoff, M, and Benbunan-Fich, R. (2000). Measuring the importance of collaborative learning for the effectiveness of ALN: A multi-measure, multi-method approach. *Journal of Asynchronous Learning Networks* 4(2): 103-125.

Long, J. S. (1997). *Regression models for categorical and limited dependent variables*. Thousand Oaks, CA: Sage.

Marks, R. B., Sibley, S. D., & Arbaugh, J. B. (2005).A structural equation model of predictors for effective online learning. *Journal of Management Education* 29 (4): 531-563.

Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), Theoretical Principles of Distance Education (pp. 22-29). New York: Routledge.

Naylor, L. A., & Wilson, L. A. (2009). Staying connected: MPA student perceptions of transactional presence. *Journal of Public Affairs Education*, 15(3): 317-331.

Rainey, Hal G. (2009). *Understanding and managing public organizations*, 4th ed. San Francisco: Jossey-Bass.

Rogers, E. M. *Diffusion of innovations*, 5th ed. New York: Simon & Schuster.

Saba, F. (2000). Research in distance education: a status report. *International Review of Research in Open and Distance Learning* 1 (1): 1-9.

Schramm, W. (1962). What we know about learning from instructional television. In *Educational television: The next ten years*. Stanford CA: The Institute for Communication Research, Stanford University.

Shin, N. (2002). Beyond interaction: The relational construct of 'transactional presence.' *Open Learning*, 17(2), 121-137.

Shin, N. (2003). Transactional presence as a critical predictor of success in distance learning. *Distance Education*, 24(1), 69-86.

Skopek, T. A., & Schuhmann, R. A. (2008). Traditional and non-traditional students in the same classroom? Additional challenges of the distance education environment. *Online Journal of Distance Learning Administration* 11(1). http://www.westga.edu/~distance/ojdla/spring111/skopek111.pdf.

Stelzer, L., Yin, J. Z., & Collins, J. (2002). Using computer networks in management education to develop higher-order critical thinking skills. Academy of Management Annual Meeting, Denver (August 9-12).

Summers, J. J., Waigandt, A., & Whittaker, T. A. (2005). A comparison of student achievement and satisfaction in an online versus a traditional face-to-face statistics class. *Innovative Higher Education* 29(3): 233-250.

Swan, K., Richardson, J.C, Ice, P., Garrison, D. R., Cleveland-Innes, M., & Arbaugh, J. B. (2008). Validating a measurement tool of presence in online communities of inquiry. E-Mentor, 2(24), 1-12. http://www.e-mentor.edu.pl/artykul/index/numer/24/id/543

Swan, K., & Shea, P. (2005). Social presence and the development of virtual learning communities. In S. R. Hiltz, & R. Goldman, (Eds.), *Learning together online: Research on asynchronous learning networks* (pp. 239–260). Mahwah, NJ: Lawrence Erlbaum.

Williams, E. A., Duray, R., & Reddy, V. (2006). Teamwork orientation, group cohesiveness, and student learning: A study of the use of teams in online distance education. *Journal of Management Education* 30(4): 592-616.

Wyatt, G. (2005). Satisfaction, academic rigor, and interaction: Perceptions of online instruction. *Education* 125(3): 460-468.

Online Courses: Student Preferences Survey

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Abstract
As online and hybrid courses are increasingly used to deliver college courses and curriculum, an online survey was developed and implemented at the University of Baltimore to capture perceptions and attitudes towards online and collaborative learning experiences during the spring 2011 term. The majority of the respondents were employed women of multi-ethnic backgrounds who were currently participating in a hybrid or fully online course. The findings indicate that they highly valued the flexibility of the online format and the access to online assessment tools and an electronic portfolio of their graded work. In terms of collaborative learning relationships, respondents rated their interactions with their instructor more favorably than their peer interactions. Various challenges for online learning are presented and discussed.

KEY WORDS: Online learning; e-learning; student preferences survey; distance education; nontraditional educational programs in health administration; University of Baltimore; Health Systems Management

Introduction

Instruction is a key component of hybrid and online learning, and is pivotal to developing quality online education. Dewey (1938) argued many years ago that instruction occurs within a social and environmental context, and that *interaction* is a defining part of all learning. Interaction enables the learner to transform information into knowledge when learners interact actively with content and with co-learners i.e. fellow students, instructors, and experts (Wu, Chen, Zhang, & Amoroso, 2005). Learning communities or "distributed learning" refers to blended and online learning in which there is a mix of interactions among learners led by instructor over a period of time (Dede, 2006). Ravert and Evans' (2007) investigation of preferences among university students suggest that as student progress through college, they prefer learning that is created through interactions and interdependence among learners.

Online technologies to enhance student learning depend on many factors including student engagement. The selection of various online technologies to best enhance student learning may be based on many factors including the learner's preferences and experiences. Metrics for evaluating online courses consider both indicators of learning performance as well as student engagement. In a study of student engagement in online courses at three different universities, Robinson and Hullinger, H. (2008) used metrics of student engagement in online courses focusing on key engagement dimensions from the 2006 National Survey of Student Engagement (NSSE). Benchmarks used in their study included level of academic challenge, faculty–student interactions, student–faculty interactions, active and collaborative learning, enriching educational experience among others. Their research found that students view faculty feedback as the most important and frequent type of interaction between student and faculty and those students also acknowledged a learning benefit associated with working in groups. This is consistent with the important role of online instructors to direct and facilitate online learning that

create a "teaching presence" (Garrison, 2007). Hyo-Jeong and Bonk (2010) found that many instructors facilitate collaborative learning by including assignments for small groups, often in a mandatory participation structure, who are given a technology median such as a wiki or a discussion forum. Thus collaborative learning results in collaborative writing.

A focus on collaborative learning may need to consider the level of instruction. Ravert and Evans (2007) pilot investigation of preferences among university students suggest that a preference for constructivist learning versus absolute instruction is developmental in nature with lower-level students preferring absolute and valuing the interdependence of learners on each other as they move into upper-level classes.

While collaborative writing is in vogue at many colleges, the increasing availability of interactive video networking technologies may see the transformation of online collaborative experiences to include experiences such as a classroom case discussion. A preference for video demonstration in augmenting clinical skills was highlighted in a study of medical students as being a useful learning tool (Gormley et al. 2009). Harris et al. (2009) suggest that students entering medical school are anticipating an interactive, information-rich, individualized learning environment that might also trigger a need for curriculum reform.

Research has also suggested differences between nontraditional learners and traditional learners in e-learning environments (Miller and Mei-Yan 2003). The flexibility and convenience of access to online courses are widely perceived as benefits to online instruction (Bolliger and Wasilik 2009; Hill 2006). The "anywhere anytime" nature of online course delivery has particular appeal to nontraditional students who often bring a myriad of family concerns and workplace stress to the classroom. In a study directed specifically at the concerns of nontraditional learners participating in online courses, Miller and Mei-Yan (2003) found that group discussion and group projects as well as faculty engagement. In particularly, timely, personalized responses from instructor to student were valued by online learners.

Some nontraditional programs are expanding the virtual classroom tools to make advising appointments using software such as elucidate (Runyon 2010) to aid the nontraditional student. It is not unusual for the college degree to be viewed more in terms of a workplace credential among nontraditional students. Artino (2007) noted that task value was a significant predictor of student performance and satisfaction in online learning and suggested that it be heightened by integrating coursework with "real world" issues. Thus, task value, the sense that the course material has immediate applicability and importance has been suggested as a key metric in student motivation and performance.

Methods

To help re-design professional courses for hybrid and online delivery, an online survey was administered to the current undergraduate and graduate students in the Health Systems Management program in the spring semester of 2011. The content included questions about students' perceptions and experiences related to online learning. The questions were posted online using Ultimate Survey and activated. An invitation to participate in the survey was emailed to all of the students, both graduate and undergraduate on Tuesday, February 22, 2011. Participation was voluntary and the IP addresses were collected to spot check for multiple entries. The end date was March 14, 2011. A total of 53 students responded; 36 were undergraduate and 17 were graduate students. The 36 undergraduates comprised a 21% sample

of the total 174 undergraduates and the 17 graduates comprised a 19% sample of the total 89 graduates.

To assess possible response bias, an analysis of demographics between the respondents and non-respondents was performed. Respondents' demographic characteristics were similar to the characteristics of the overall Health Systems Management program. University of Baltimore's Health Systems Management program had enrolled 263 students in the spring, 2011. Of the total 263 current students enrolled in the spring 2011, 80% are female (209 females and 54 males.) This majority was reflected in the 92% of women respondents. The average age of the Health Systems Management students is 34.5 years and the majority of the respondents were over 30 years of age. Similar to all students in the program, the overwhelming majority (92%) of respondents were employed.

The respondents described their race or ethnicity with 47% of respondents describing themselves as "Black," 21% of respondents describing themselves as white, and just under a third, 32%, describing themselves as "American Indian," "Asian," "Hispanic," "Other," or choosing not to answer.

Survey Results

When asked to describe the type of courses that they were currently taking, respondents reported 49.1% traditional classroom setting, 37.7% web enhanced (a face to face that includes a web component), 13.1% hybrid (classroom time is shorted to offset time spent online), and 60.4% fully online. Students were able to select more than one course type.

The online courses were facilitated through an educational management system, WebTycho, such that all students reported having access to general courseware. Sixty percent had used discussion boards and 36% had used prerecorded video and 30% had used chat rooms or chat boxes. Sixteen percent had used interactive video and 10% had used webinars. Telephone conferencing (6%), social media (4%), and prerecorded audio (8%) were used less often with less than 10% reporting have experienced this technology type. Three respondents did not select to answer this question or had not used any of these tools.

Perceptions and Attitudes towards Online Learning

Questions on perceptions and attitudes towards online learning were grouped into three sections: Perceived IT ability, Attitudes towards online learning, and Perceived usefulness of different e-learning tools.

The respondents' perceived IT ability was gauged with three Likert scale questions with a selected score 1 being "strongly agree" and a score of 4 being "strongly disagree." On access to a computer, 99% of the respondents strongly agreed or agreed that most of the time they had access to a computer with only one respondent replying with disagree or strongly disagree. Respondents, by and large, reported confidence in browsing the Internet with 92% strongly agreeing or agreeing. Confidence was also high using media software with 86% strongly agreeing or agreeing to the statement "I feel confident using media software" (Table 1).

Table 1. Perceived IT ability and attitudes towards online learning

	n	Average	%			
			Strongly Agree	Agree	Disagree	Strongly Disagree
Perceived IT ability						
Overall I have access to a computer most of the time.	11	1.2	84%	14%	0%	2%
I am confident browsing the internet	51	1.3	82%	10%	4%	4%
I am confident using media software	51	1.6	57%	29%	10%	4%
I find I need some technical assistance in using online course tools.	51	2.8	18%	24%	20%	39%
Attitudes toward online learning						
A fully online course is useful in my gaining knowledge.	52	1.7	56%	29%	10%	6%
E-learning is helpful for assessment (aka standardized quizzes) and access to my portfolio of graded work.	52	1.4	67%	23%	10%	0%
Fully online courses leave me feeling isolated	51	3.1	18%	6%	29%	47%
A benefit to online learning is the possibility for international collaborations.	52	1.6	60%	25%	15%	0%
A benefit to online learning is flexibility.	50	1.3	76%	18%	4%	2%
E-learning enhances my interactions with peers and instructors.	51	2.2	35%	25%	22%	18%

While confidence was high in using the Internet and media software, there were some respondents (42%) who responded in agreement (strongly agree or agree) to the statement "I find I need some technical assistance in using online course tools."

In addition to reporting confidence, respondents reported that online course were useful for gaining knowledge (85% agreeing or agreeing strongly), helpful for access to their portfolio of graded work (90%), possibly a benefit for international collaborations (85%). The strongest agreement was that online courses allowed for additional flexibility (94%). There was disagreement reported from respondents to the statement that online course were isolating. However, agreement was weaker (61%) for the statement "e-learning enhances my interaction with peers and instructors."

In terms of their perceived usefulness of various online technologies and tools, students ranked the following tools beginning with the most useful and the average rating shown in Table 2 with 1 indicating the most useful score and 4 indicating the least useful score.

Table 2. Perceived usefulness of different e-learning tools

			%			
I find the following useful:	*n*	Average	Very Useful 1	2	3	Not Useful 4
General courseware (aka WebTycho) to see the syllabus, assignments, course material	52	1.1	92%	8%	0%	0%
Online assessment tools (aka online quizzes) that are graded	52	1.4	73%	17%	8%	2%
File sharing and collaborative document sharing i.e. sharing presentation slides with peers	49	1.6	59%	27%	8%	6%
Discussion boards	51	1.7	61%	14%	16%	10%
Pre-recorded video	51	1.9	51%	14%	27%	8%
Interactive Video (the professor can see/hear you and you can see/hear him/her)	50	2	40%	30%	16%	14% 7
Webinars	48	2.1	31%	38%	23%	8% 4
Student blogs (part of a website maintained by an individual with entries and readers can follow and post comments.)	50	2.1	30%	38%	24%	8% 4
Virtual study groups to collaborate on group projects	51	2.3	31%	25%	24%	20%
Wikis (a website that allows the creation and editing of any number of interlinked web pages.)	47	2.4	28%	21%	32%	19%
Telephone conferencing	49	2.5	27%	18%	37%	18%

Respondents perceived general courseware and online assessment as very useful. Document sharing, discussion boards, and pre-recorded video were also perceived as rather useful. Interactive video, webinars, student blogs, virtual study groups, wikis, and teleconferencing were not rated as highly in usefulness.

Overall, respondents appeared to have positive feelings about their access to computer and confidence using online tools. Online learning was valued for its flexibility, assessment role, and as a learning tool. However, there was less agreement on the value of the interaction between instructors and peers in online courses which is the key focus on the following section of questions on collaborative learning.

Collaborative Learning

The collaborative learning section was aimed at determining, first, the degree of interaction between students and instructors and, second, the degree of interaction among students themselves with each other.

The first section asked about agreement concerning the degree of interaction with the faculty. There was generally agreement that faculty interacted with students: sharing ideas from the reading, discussing assignments or grades, and giving prompt feedback. (Table 3)

The second section used the same agreement score but addressed questions about student-to-student or peer-to-peer learning. Student-to-student interaction scores were lower indicating less interaction among students in the class than among individual students with faculty. While some respondents suggested that students participated in discussions, commented on their

discussion posts or blogs and sent an occasional email, there was less agreement that a relationship developed or that mentoring occurred from one student to another. (Table 3)

Table 3 Collaborative learning

			%			
	n	Average	Strongly Agree	Agree	Disagree	Strongly Disagree
Instructor to student						
Faculty discussed assignments or grades.	53	1.2	75%	25%	0%	0%
Faculty gave prompt feedback on assignments.	53	1.3	70%	26%	4%	0%
Faculty shared ideas from reading or class notes.	53	1.4	72%	23%	2%	4%
Student to student						
I participated in a discussion with another student.	52	1.5	69%	21%	2%	8%
I commented on another student's discussion post or blog or added to a wiki.	51	1.8	61%	18%	4%	18%
I worked on a project with another student (s) using group email.	52	1.8	52%	25%	13%	10%
I shared written documents with other students in the class.	51	1.8	51%	29%	6%	14%
I took part in a group presentation.	52	1.9	50%	23%	15%	12%
I worked on a project with another student(s) using collaborative file sharing.	52	2	46%	27%	8%	19%
I shared an individual presentation.	51	2.1	47%	22%	10%	22%
I provided mentoring to or sought assistance from another student in the class	51	2.2	41%	22%	16%	22%
A peer to peer relationship developed from an online class.	51	2.2	41%	20%	18%	22%

Time Online

Respondents were asked about how much time in hours they spent online for their class work in a given day. The average reported among of time was 4.5 hours and the median was 4 hours. A respondent reported spending 20 hours online in a given day but removing that response as an outlier the average is 4.26 hours.

Respondents also reported spending some of their leisure time in online activities. The average amount of leisure time spent online was 3.11 hours with a median of 2 hours. Again, there was a respondent that reported 20 hours online in leisure time. Removing that "20 hours" response from the calculation brings the average hours to 2.78 hours.

Websites that were popular with respondents included Facebook with 63% of respondents visiting this site, news-related sites (62%) and Youtube (51%). Websites that assisted in the search for job opportunities (45%) or for scholarships (42%) were also reported as useful to respondents. Less popular were twitter (11%), LinkedIn (19%), iTunes (23%), TED (6%), other (15%), and online gaming sites (6%). In a given day, the average respondent spends a fairly significant amount of time online each day.

Comments

Many respondents did send in open comments with 31 describing ways that online courses enhanced their learning experiences, with 29 describing some limitations and 14 submitting general comments that were by and large reflecting feelings about particular courses.

Some highlighted the convenience:

I love on line learning. As a full time working adult with a family who drives back and forth from MD to PA every day, it's a necessity. I love UB, so I wanted to continue my education here, on line learning helps me to be flexible.

Others mentioned the challenge of group work as a limitation

I do not like group and team effort assignments with online courses. The point of choosing an online course over a lecture course is the appeal that you can make your own time for it. It's very frustrating that I work 40 hours a week, have a family, yet still need to make time with my partners who are all full time students with no family responsibilities.

Another view suggested that what is commonly viewed as a limitation, the lack of face-to-face interaction could be viewed as a benefit in terms of group productivity

online classes are actually enhanced by the lack of face to face because students HAVE to communicate through the email system or phone, which improves productivity in the forced groups that every instructor (online or otherwise) insist on making us poor students participate in...

Discussion

The context of this study is a nontraditional educational program for healthcare managers. Coursework is offered at both the undergraduate and graduate levels in a mix of online and hybrid formats as well as in face-to-face classes that meet on Saturdays to be convenient for professionals working in the healthcare field. Literature and previous studies suggest that nontraditional students value the flexibility of online classes, appreciate prompt feedback from faculty, and valued group projects and discussion (Miller and Mei-Yan 2003). These survey results were largely in keeping with those views as respondents did highly value flexibility, strongly agreed that faculty interactions included prompt feedback, and discussion boards were perceived as a useful tool. Yet, there was some disagreement about the value of small group projects for fully online courses, and the lack of face-to-face interaction was viewed as a limitation by many respondents. Still most respondents did not experience feelings of isolation.

Respondents to this online survey indicated a fairly strong computer access, Internet browsing confidence, and media software skills. This was echoed in many of the earlier studies of online learners as laptops, iPads, and smart phones becoming more common place on college campuses (Gormley et al. 2009; Harris et al. 2009).

Respondents perceived the most useful online tools to include general courseware, discussion boards, and pre-recorded video. This usefulness of video parallels preferences reported in studies of medical students' perceptions of useful tools. Similarly, required participation in discussion boards was a recommended method for facilitating collaboration projects in a study examining the roles of blended learning approaches (Hyo-Jeong and Bonk 2010). Wikis, however, were not rated as highly useful by the respondents to our survey. It is worth noting that while respondents rate telephone conferencing and wikis as less useful tools, it may reflect limited comfort level with those tools due in part to lack of experience with them as

they may yet prove helpful in counterbalancing some of the limitations in terms of student-to-student interactions.

Views on collaborative learning reflected stronger interaction between students to instructor than student to student. This finding hinted at a common concern expressed in the literature that interaction is limited in learning environments where students never or seldom meet face to face (Bollinger and Wasilik 2009).

Limitations in this study included a limited response rate of 20%. The student body is mostly female, 79%, and females were overrepresented in the respondents, 92%. This survey could be replicated with a larger sample or augmented with techniques to encourage a higher response rate or it could be reintroduced every few years as a barometer of changing views towards online learning. It is worth noting that benchmarking perceptions of ability and engagement do not necessarily provide a blueprint for improving those measures.

Dewey (1938) argued that education occurs within a social and environmental context, and that *interaction* is a defining part of all learning. Interaction enables the learner to transform information into knowledge when learners interact actively with content and with co-learners i.e. fellow students, instructors, and experts (Wu, Chen, Zhang, & Amoroso, 2005).

The quality and quantity of learner-instructor interaction depends on the instructional design and selection of learning activities. Instructors need to plan learning activities that maximize the impact of interactions with students and provide alternative forms of interaction when time constraints become excessive (Anderson, 2003). Thus, instructors are challenged to build in more learner interaction with peers for online and blended courses.

Blended and online learning require that faculty must reassess their roles as well as those of students. Students need to accept more responsibility for managing their learning while instructors become more facilitative in teaching (Dzuiban, Hartmann, & Moskal, 2004). As student-teacher interaction is highly valued by students, instructors need to consider ways to integrate online learning activities that promote interactions and enhance learning.

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References

Anderson, T. (2003). *Modes of interaction in distance education: Recent developments and research questions*. In M. Moore & W. Anderson (Eds.), Handbook of distance education (pp. 129-144). Mahwah, NJ: L. Erlbaum Associates.

Artino, J.R. 2007. "Online Military Training: Using a Social Cognitive View of Motivation and Self-Regulation to Understand Students' Satisfaction, Perceived Learning, and Choice." *Quarterly Review of Distance Education* 8 (3): 191-202. Retrieved from EBSCOhost.

Bolliger, D.U., and O. Wasilik 2009. "Factors Influencing Faculty Satisfaction with Online Teaching and Learning in Higher Education." *Distance Education* 30 (1), 103-116. doi:10.1080/01587910902845949.

Dede, C. (Ed.). (2006). Online professional development for teachers: Emerging models and methods. Cambridge: Harvard Education Press.

Dewey, J. (1938). *Logic: The theory of inquiry*. New York: Holt, Rinehart and Winston.

Dzuiban, C. D., Hartman, J. L., & Moskal, P. D. (2004). Blended Learning. *Research Bulletin*, 2004(7). Retrieved from EDUCAUSE, Center for Applied Research website http://net.educause.edu/ir/library/pdf/ERB0407.pdf

Garrison, D. R. (2007). Online community of inquiry review: Social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks*, *11*(1), 61-72.

Gormley, G.J., K. Collins, M. Boohan, I.C. Bickle, and M. Stevenson 2009. "Is There a Place for e-Learning in Clinical Skills? A Survey of Undergraduate Medical Students' Experiences and Attitudes." *Medical Teacher* 31 (1): 6-12. doi:10.1080/01421590802334317.

Harris, S.S., B. Barden, H. Walker, and M.A. Reznek 2009. "Assessment of Student Learning Behaviors to Guide the Integration of Technology in Curriculum Reform." *Information Services & Use* 29 (1): 45-52. doi:10.3233/ISU-2009-0591.

Hill, J. 2006. "Flexible Learning Environments: Leveraging the Affordances of Flexible Delivery and Flexible Learning." *Innovative Higher Education* 31 (3): 187-197. doi: 10.1007/s10755-006-9016-6.

Hyo-Jeong, S., and C.J. Bonk 2010. "Examining the Roles of Blended Learning Approaches in Computer-Supported Collaborative Learning (CSCL) Environments: A Delphi Study." *Journal of Educational Technology & Society* 13 (3): 189-200. Retrieved from EBSCO*host*.

Miller, M.T., and L. Mei-Yan 2003. Serving Non-Traditional Students in E-Learning Environments: Building Successful Communities in the Virtual Campus. *Educational Media International* 40 (1/2): 163. Retrieved from EBSCO*host*.

Ravert, R.D., and M.A. Evans 2007. "College Student Preferences for Absolute Knowledge and Perspective in Instruction: Implications for Traditional and Online Learning Environments." *Quarterly Review of Distance Education* 8 (4): 321-328. Retrieved from EBSCO*host*.

Robinson, C., and H. Hullinger 2008. "New Benchmarks in Higher Education: Student Engagement in Online Learning." *Journal of Education for Business* 84 (2): 101-109. Retrieved from EBSCO*host*.

Rogers, E.M. (1995). *Diffusion of innovations* (4th ed.). The Free Press New York, NY.

Runyon, J.M. 2010. "Faculty Mentoring and Student Engagement Are Keys to Success in Virtual Classroom." *Community College Week* 6-7. Retrieved from EBSCO*host*. Website http://connection.ebscohost.com/c/articles/49009194/faculty-mentoring-student-engagement-are-keys-success-virtual-classroom

Wu, J., Chen, C., Zhang, Y. J., & Amoroso, D. L. (2005).Virtual group learning effectiveness via elearning mediums. Proceedings of the Americas Conference on Information Systems, Paper 306. Retrieved from http://aisel.aisnet.org/amcis2005/306

A Research Review about Online Learning: Are Students Satisfied? Why do Some Succeed and Others Fail? What Contributes to Higher Retention Rates and Positive Learning Outcomes?

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The SOURCE on Community College Issues, Trends & Strategies

Abstract
What are the foundations of student satisfaction or dissatisfaction with online courses? Why do online learners succeed and others fail or drop out? What kind of instructional designs, pedagogical practices, and administrative standards contribute to the development of effective online courses with high retention rates and positive student learning outcomes?

Plenty of valid, well-researched information and literature reviews, along with abundant data accumulated through student/faculty surveys and online learning course evaluations, are outlined and summarized inside numerous academic papers that attempt to answer such questions.

This report is based on the author's search and analysis of numerous scholarly academic papers that addressed such questions and were published between 2004 and 2007.

KEY WORDS: student satisfaction; online learning; distance education; retention rates; learning outcomes

A Word About Sample Size

A good number of papers that were examined for this report relied on very small samples as the basis of their findings, ranging from a very in-depth paper on students' perceptions of online education based on interviews conducted with three students (Yang and Cornelius 2004); to an informative paper based on the qualitative descriptions of six professors and seven students' attitudes, perceptions, and experiences of online learning in a College of Education (Lao and Gonzales 2005); to a deep examination of the dynamics of online discussions and their relationship to student learning outcomes in an online graduate-level English grammar class comprising 15 students (Ho and Swan 2007). However, these types of papers, which were based on relatively small samples, are not the focus of this report. Instead, the findings synthesized and presented in this report are based on studies that garnered responses from a minimum of 60 to more than 1,000 online learners.

Numerous Factors

It also needs to be noted that it is very difficult to speak singularly about online learning, as there are numerous factors within different disciplines and course and program environments, along with unique and varied dynamics pertaining to student demographics and psychographics, instructional design and pedagogy, and much more, that reveal a wide variety of learning outcomes and student perceptions and levels of satisfaction concerning online teaching and learning.

Stating the Obvious

In addition, much of the research reveals an over supply of redundancy, with common-sense notions about teaching, learning, and access presented as interesting or new discoveries. Repeatedly, for instance, it is proclaimed that students are satisfied with online learning because it is flexible and convenient, especially for busy, working adult learners. Plus, obvious notions about students being self-directed and motivated to learn too frequently come up as primary reasons for a student's satisfaction with his or her online learning experiences, as well as their overall success as learners.

However, as Morris, Finnegan, and Wu point out, even with this overemphasis on the obvious, a review of the literature concerning student satisfaction and dissatisfaction, and effective pedagogies and course designs, in online learning environments, can certainly be helpful.

Such studies provide a necessary basis for understanding the complex interactions between students, faculty, course materials and course structures. As more institutions offer online courses to handle burgeoning enrollments, and as students increasingly expect alternatives to face-to-face courses, it becomes imperative to understand what constitutes and encourages successful student behavior in this environment (Morris, Finnegan, and Wu 2005).

To support the aforementioned, Morris et al. admittedly point out that the results of their research—from a study they conducted on a relatively large population of 423 students enrolled in 13 sections across three fully online courses—are quite obvious but necessary. They note, for instance, that 137 withdrew from their online course because they "were not sufficiently motivated to engage in online learning tasks to complete the course;" 72 were non-successful completers because they "were far less active in participation than successful students;" and 214 were successful completers because they "engaged in online learning activities with greater frequency and greater amounts of time than unsuccessful, withdrawing students" (Morris, Finnegan, and Wu 2005).

Seven Factors That Drive Student Satisfaction

In addition to the point of view that online learning provides primarily adult learners with a convenient and flexible environment to gain knowledge and earn a higher education credential for career and personal advancement, there are many other elements of online courses that generate satisfactory results among students.

Sun et al. (2007) identified the following seven critical factors that influence online learners' satisfaction based on 295 responses from students enrolled in 16 different online learning courses at two public universities in Taiwan: computer anxiety, instructor attitude, course flexibility, course quality, perceived usefulness, perceived ease of use, and diversity of assessment.

Sun et al. explain that "not surprisingly," course quality is the most important concern and that technological design plays an important role in students' perceived usefulness and ease of use of a course. Additionally, Sun et al. claim that the assessment strategy of any online course should include student and/or peer assessment in addition to the instructor's evaluations of student performance.

Instructor Attitude and Selection

The Sun et al. study also found that instructors attitudes toward e-Learning positively influence students' satisfaction. When instructors are committed to e-Learning and exhibit active and positive attitudes, their enthusiasm will be perceived and further motivate students. In light of this, school administrators must be very careful in selecting instructors for e-Learning courses (Sun et al. 2007).

A similar notion about selecting instructors was mentioned in a feature article in *Recruitment & Retention*. A distance educator at Boise State University explained that her research about online learning revealed that students frequently complained about having an unengaged or uninvolved instructor as a reason for their dissatisfaction. Solutions could be addressed as early as the faculty hiring process by selecting instructors who like to communicate with students online and by informing new faculty of the increased time demands that typically accompany teaching online (Magna Publications 2005).

Instructional Factors

In a recent study conducted by Lim, Morris, and Kurpitz, the learning outcomes of online and blended learning delivery methods were compared. One hundred twenty-five undergraduate students in a program evaluation course at the University of Tennessee, most of whom were majoring in Human Resource Development, completed a close-ended and open-ended questionnaire that was written in a language that was familiar to the learners using terminology taught in the course. Among the 125 students, 59 were enrolled in an online course and 69 were enrolled in the same course taught in a blended modality. Sixty-seven percent of these students were between 18 and 19 years of age. Data analysis revealed that the course format did not affect students' learning application to any significant degree. However, within the two groups, various instructional activities were deemed more important than others. In particular, group and individual projects, discussions and class assignments facilitated the most learning.

This finding has implications for the importance of learning application for greater learning satisfaction and increased learning regardless of the different instructional formats. That is, learners seemed to value those learning activities that they could apply learned knowledge and skills to personal situations more than merely understanding instructed learning content in both online and blended learning environments (Lim, Morris, and Kupritz 2007).

A variety of instructional factors can play a vital role in whether or not students, in general, are satisfied with online learning and/or are actually learning anything.

Virtual Teams and Collaborative Learning

Shen, Hiltz, and Bieber presented results of a field experience of virtual teams that took online examinations. Using data collected from 485 students, Shen et al. indicated that collaborative examinations enhance interactions and the sense of an online learning community, resulting in significantly higher levels of perceived learning and student satisfaction. These collaborative exams were facilitated through online asynchronous conferences in which anonymous students and the instructor discussed the exam design, questions, and grades. The conferences allowed students to share ideas, reflect on others' ideas, and collaborate whenever they wanted to. Shen et

al. observed that, consistent with other studies related to collaborative learning, virtual teams taking online examinations experience increased involvement with course materials and with each other. Additionally, such collaborative systems facilitate problem solving and higher levels of critical thinking (Shen, Hiltz, and Bieber 2006).

Feedback, Communication and Rewards

In another paper—based on a study of 125 undergraduate online learners—that had a focus on instructional factors, it was pointed out that motivating online learners, and keeping student satisfaction at healthy and productive levels, can be accomplished by providing timely and frequent feedback to students; facilitating alternative communication experiences through such mechanisms as live chat and audio/video conferencing; and rewarding students with devices other than grades, such as by sharing accomplishments among peers (Lim). Additionally, the authors of this study called for instructional designers and instructors to pay closer attention to utilizing motivational strategies that result in a more outcome-oriented online instruction (Lim, Morris, and Yoon 2006).

Online Learning Design Issues

The authors also listed the following factors, some of which were related to instruction, and were referred to as "issues in online learning design," that help facilitate meaningful learning engagement and learner satisfaction:

—A reliable and fail-safe technology system.

—Clear guidelines for class assignments and faculty feedback.

—Appropriate technology standards to deliver instruction.

—Meaningful learning experiences to demonstrate students' ability of analysis, synthesis and evaluation of learning content.

—Facilitated interaction among students and between students and faculty.

—Facilitation of student self-motivation and commitment.

—Access to adequate technical assistance and orientation prior to the course (Institute for Higher Education Policy 2000).

About Retention Rates

Of course, a satisfied online learner most always and logically means that he/she will stay committed for the full duration of a course or a program.

Meyer, Bruwelheide, and Poulin wrote a paper that included a literature review on three theories of online student retention. The literature review section of this paper was a prelude to their exploration of why 60 out of 62 students completed or remained enrolled in a 21-credit, seven-course online certification program in library media offered by Montana State University-Bozeman (Meyer, Bruwelheide, and Poulin 2006).

The first theory is "Tinto's Model," which posits, in part, that a student's involvement in peer-group interactions affects his or her commitment to their course of study and ultimately a full and meaningful integration into an institution (Tinto 1998). Tinto's model is one of the most widely accepted models for attrition and has been known to be responsible for the creation of learning communities and Freshman Interest Groups in higher education (Rovai 2003).

The second theory is based on the work of Bean and Metzner, who, in contrast to Tinto, describe non-traditional students over the age of 24 who are not influenced so much by peer interactions or social integration as they are by the encouragement they may get from friends, employers, and family, as well as from the utility of education they have enrolled in (Bean and Metzner 1985).

The third theory is called "Community of Inquiry" and is based on the work of Garrison, Anderson, and Archer, who combined three constructs: social presence, teaching presence and cognitive presence. The authors note, however, that these constructs are more of a learning model than a retention model, per se (Garrison, Anderson, and Archer 2000).

Social presence is the ability of students and faculty to project themselves socially and emotionally. Teaching presence is the binding element to creating the Community of Inquiry and includes developing, managing, and facilitating higher-order learning. Cognitive presence is the process of knowledge construction or critical thinking and moves from perceiving through exploration to integration and resolution (Garrison, Anderson, and Archer 2000).

Why Students Drop Out

Meyer et al. also mention several studies on why students drop out of online learning, referring to a Willing and Johnson study in which students' reasons for dropping out of online courses were no different than in the face-to-face environment (Willging and Johnson 2004). A study of an online MBA program found that online courses such as accounting and business statistics had higher attrition rates than on-campus courses (Terry 2001). Another study concluded that many students drop out of online courses because they simply were too stretched with work and family responsibilities to devote enough time to their classwork (Diaz 2002).

Why Students Stay

Regarding the study of the online certification program and its near-perfect retention rate, Meyer et al. found that the flexibility, convenience, and the relevancy of the program to their careers and job were what initially attracted students to this program.

What keeps these students enrolled are various qualities of the faculty, the quality of the coursework, and personal reasons. Perhaps one can tentatively conclude that while it is the online nature of the program that lures a student to enroll (and allows them to stay enrolled), it is the nature of the relationships with faculty, the quality of the educational experience, and their own personal and individual reasons and motivations that keep them enrolled (Meyer, Bruwelheide, and Poulin 2006).

The Importance of Student Services

Providing effective, professional, and sufficient student services are also very important elements that help keep students motivated, satisfied, and enrolled in online learning courses and programs. In particular, two areas of high concern in relation to student services were noted in a paper based on a study of 272 online degree-seeking students from six higher education institutions: bookstore services and academic advising.

While online vendors such as Amazon, Barnes, and Noble, and other booksellers often provide fairly decent and adequate services for students to purchase the textbooks they need for

their online courses, the study found that students preferred to purchase books directly from their institution's bookstore. The study noted that research about bookstore services has not surfaced in the literature about student services, but their study suggested that "online learners perceive these services as a critical part of their experience in relation to other student support services (Raphael 2006)." In relation to academic advising, "clear, complete and timely information regarding curriculum requirements," was the student service deemed most important to students.

In particular, 48.5% of the participants in this study reported that they had completed less than 30 hours towards their degree at the time of survey completion. Students at the beginning of a degree program typically require more intense advising than students further along in the process. These busy individuals hope to enroll in courses that will lead them down their desired paths. They also want to be sure that the degree they seek provides them the training, experiences, or knowledge needed to meet their goals. Without solid academic advising services, online degree seekers inevitably flounder at some point during their distance education experience (Raphael 2006).

In a study conducted by the Alliance for Higher Education Competitiveness with 21 institutions who described themselves as being successful in online learning, student services tied for third as one of the most important factors in achieving success. In particular, this study noted:

Course materials must be available and easy to use, and students must have someone to call when they need technical help. A new trend was to establish a contact point for resolution of any student issue. This individual went by many names, such as program coordinator or advisor (Abel 2005).

Additionally, providing a host of student services in an online modality is a trend that is growing in usage at institutions. At Syracuse University, for instance, a separate online account for student services is available for all online students. The account includes an online student services-oriented course that includes informal online academic and career advising services conducted through live chats and asynchronous discussion forums, a textbook swap service, and registration information. A student services staff member monitors the course and answers questions posted by students. Faculty and other staff are also enrolled in the course and participate in discussions. Administrators of this service say that it has increased communication on all levels and has helped to increase a sense of community among students, faculty, and staff (Dah 2005).

Another student service that can be considered vitally important revolves around providing effective online orientation courses to new online learners. At Portland State University, for instance, effective online orientations include the following components:

—Stress what kind of technical support is available and how to use it.

—Include information about developing time management skills, especially for adult learners who have busy schedules.

—Extensive review and practice on how to communicate effectively in the online environment (Educational Pathways 2005).

The Big Picture

When looking at the overall landscape of online teaching and learning, Muilenburg and Berge wrote a very interesting and important paper based on a large scale (*n*=1,056) exploratory factor

analysis that explained and defined student barriers to online learning. In short, they came up with eight barriers/obstacles/factors:

—Barriers that administrators and instructors control.

—Obstacles to online learning caused by a lack of interaction.

—Obstacles to online learning caused by a lack of academic skills.

—Obstacles to online learning caused by a lack of technical skills.

—Factors related to learner motivation.

—Factors related to time and support for studies.

—Factors related to cost and access to the Internet.

—Obstacles caused by technical problems (Mulienburg and Berge 2005).

Another interesting and important report that had a big-picture theme was based on an EBSCO database review of scholarly articles that focused strictly on online instruction and were published between 1999 and 2004. The researchers for this report used "online instruction," "student satisfaction," and "distance education" as their most productive search strings. From this review, six subtopics were identified:

—A comparison of online instruction to face-to-face instruction.

—Evaluation of online courses.

—Reasons students choose online courses.

—Contributors to student satisfaction.

—Predictors of student satisfaction.

—Course design and implementation considerations (Johnston, Killion, and Oomen 2005).

The reasons why students choose online courses were listed as flexibility, convenience, and access to a course. Online distance education was their preferred learning style, e.g., shy students have a voice online and feel more comfortable participating in the online environment, and other students enjoy working at their own pace to better understand material being taught. It was also noted that some students sign up for online courses because they have the wrong perception that such courses may be easier, when, in fact, they are most always equally or more challenging than traditional face-to-face courses (Johnston, Killion, and Oomen 2005).

The contributors to student satisfaction were noted as positive and effective contact and interaction with the instructor, clarity and relevance of assignments and communication, access to campus-based resources, availability of technical support, and orientation to the course and its use of technology. Additionally, "the ability of students to interact with each other reduces the feelings of isolation and improves satisfaction" (Johnston, Killion, and Oomen 2005).

The predictors of student satisfaction were strongly related to interaction with faculty and peers. Other predictors included "timely comments, variety of assessment, and students know how they will work with groups and teams to be statistically significant predictors." Also, an extroverted personality type was said to be a valid predictor of student satisfaction (Johnston, Killion, and Oomen 2005).

The Independent, Self-Directed Learner

Despite many common notions about positive interaction with other students being a key driver for student satisfaction in the online learning environment, there is another category of student who prefers to study and progress through a distance education degree program independently. This student type is typically an adult learner in his or her middle to late 30s, or older, who is

self-directed, disciplined, and does not find it necessary, nor has the desire, to engage in fully online classes with other students.

Western Governors University (WGU) is a prime example of this through its distance-education, competency-based degree offerings. WGU started offering its unique brand of distance education in 1999 and today has more than 8,000 students with an average age of 38. Its competency-based model awards degrees based on their students' ability to pass assessments. Students earn competency units towards earning a degree after meeting specific learning goals and passing the appropriate assessments.

Every WGU student is assigned a mentor who is a professional one-on-one academic counselor that, in addition to providing advisement services and information about WGU policies and procedures, also provides content-related support as students prepare for their assessments. To help them with their studies, WGU students are also provided access to instructor-led online courses from other institutions, independent-study e-learning modules from various commercial enterprises, the appropriate textbooks through the WGU bookstore, and the wide and varied number of important information resources available online through the WGU central library system.

It is interesting to note, however, that the instructor-led online courses are not the primary study resource for the typically successful student at WGU.

Ironically, the most successful students in the WGU Teachers College, according to Janet Schnitz, executive director of the Teachers College, are those who work well with accessing and utilizing the many independent learning resources that WGU provides, not the students who rely on taking the instructor-led online courses offered by institutional partners.

"We find that the students who rely on online courses are usually the weaker students, and they also need more guidance and support," says Schnitz. "The students who work with our independent learning resources and our mentors seem to do much better in the programs we have to offer." Schnitz adds that many students come into WGU "being field dependent," and, over time, become "field independent" and more able to basically build their own educational pathway (Educational Pathways 2007).

Conclusion

As explained throughout this report, there are numerous factors to take under consideration when attempting to define or pinpoint exactly what makes an online learner satisfied, motivated, and ultimately successful.

Just like in the traditional face-to-face environment, unique circumstances surround every learner, every instructor, every course, every department, every program, and every institution. So, logically speaking, an effective path to take for building any successful online learning course or program—one in which students are satisfied and do not drop out—requires, at the very least, a focus on the individual student to a position in which his or her educational needs, skills, access, and personal circumstances are identified. Then, based on this thorough identification, the appropriate levels of advisement, content, and interaction must be consistently applied to the student's course of study throughout his/her online education experience.

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References

Abel, Rob. 2005. "Implementing Best Practices in Online Learning." *EDUCAUSE Quarterly* 28 (3).

Bean, J.P., and B.S. Metzner. 1985. "A Conceptual Model of Nontraditional Undergraduate Student Attrition." Review of Educational Research 55 (4), in Meyer, Katrina A., Janis Bruwelheide, and Russell Poulin. 2006. "Why They Stayed: Near-Perfect Retention In An Online Certification Program in Library Media." *Journal of Asynchronous Learning Networks* 10 (4), December.

Dahl, Judy. 2005. "Online Services Keep Syracuse Students Satisfied." *Distance Education Report* 1 November.

Diaz, D.P. 2002. "Online Drop Rates Revisited." The Technology Source, May/June, in Meyer, Katrina A., Janis Bruwelheide, and Russell Poulin. 2006. "Why They Stayed: Near-Perfect Retention In An Online Certification Program in Library Media." *Journal of Asynchronous Learning Networks* 10 (4), December.

Educational Pathways. 2005. "Conducting Effective Orientations to Online Learning." *Educational Pathways* January.

Educational Pathways. 2007. "WGU Learning Resources and the Self-Directed Student." *Educational Pathways*, July–August.

Garrison, D.R., T. Anderson, and W. Archer. 2000. "Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education." *The Internet and Higher Education* 2 (2–3), in Meyer, Katrina A., Janis Bruwelheide, and Russell Poulin. 2006. "Why They Stayed: Near-Perfect Retention In An Online Certification Program in Library Media." *Journal of Asynchronous Learning Networks* 10 (4), December.

Ho, Chia-Huan, and Karen Swan. 2007. "Evaluating Online conversation in an Asynchronous Learning Environment: An Application of Grice's Cooperative Principle." *Internet and Higher Education* 10 (1).

Institute for Higher Education Policy. 2000. "Quality On The Line: Benchmarks for Success in Internet-Based Distance Education," 2000, in Lim, Doo Hun, Michael Lane Morris, and Seung-Won Yoon. 2006. "Combined Effect of Instructional and Learner Variables On Course Outcomes Within An Online Learning Environment." *Journal of Interactive Online Learning* 5 (3), Winter.

Johnston, James, Jeff Killion, and Jody Oomen. 2005. "Student Satisfaction in the Virtual Classroom." *The Internet Journal of Allied Heal Sciences and Practice* 3 (2), April.

Lao, Teresa, and Carmen Gonzales. 2003. "Understanding Online Learning Through a Qualitative Description of Professors and Students' Experiences." *Journal of Technology and Teacher Education* 13 (3).

Lim, Doo Hun. "Cross Cultural Difference in Online Learning Motivation." Educational Media International 41 (2): 163-173, in Lim, Doo Hun, Michael Lane Morris and Seung-Won Yoon. 2006. "Combined Effect of Instructional and Learner Variables On Course Outcomes Within An Online Learning Environment." *Journal of Interactive Online Learning* 5 (3), Winter.

Lim, Doo Hun, Michael Lane Morris, and Seung-Won Yoon. 2006. "Combined Effect of Instructional and Learner Variables On Course Outcomes Within An Online Learning Environment." *Journal of Interactive Online Learning* 5 (3), Winter.

Lim, Doo Hun, Michael L. Morris, and Virginia W. Kupritz. 2007. "Online vs. Blended Learning: Differences In Instructional Outcomes and Learner Satisfaction." *Journal of Asynchronous Learning Networks* 11 (2), July.

Magna Publications. 2005. "Distance Education Retention: The SIEME Model." *Retirement & Retention,* December.

Meyer, Katrina A., Janis Bruwelheide, and Russell Poulin. 2006. "Why They Stayed: Near-Perfect Retention In An Online Certification Program in Library Media." *Journal of Asynchronous Learning Networks* 10 (4), December.

Morris, Libby V, Catherine Finnegan, and Sz-Shyan Wu. 2005. "Tracking Student Behavior, Persistence and Achievement in Online Courses." *Internet and Higher Education* 8 (3).

Muilenburg, Lin Y., and Zane L. Berge. 2005. "Student Barriers to Online Learning: A Factor Analytic Study." *Distance Education* 26 (1), May.

Raphael, Amy. 2006. "A Needs Assessment" A Study of Perceived Need for Student Services by Distance Learners." *Online Journal of Distance Learning Administration* IX (II), Summer, University of West Georgia, Distance Education Center.

Rovai, A.P. 2003. "In Search Of Higher Persistence Rates in Distance Education Online Programs." *The Internet and Higher Education* 6: 1-16, in Meyer, Katrina A., Janis Bruwelheide, and Russell Poulin. 2006. "Why They Stayed: Near-Perfect Retention In An Online Certification Program in Library Media." *Journal of Asynchronous Learning Networks* 10 (4), December.

Shen, Jia, Starr Roxanee Hiltz, and Michael Bieber. 2003. "Collaborative Online Examinations: Impacts on Interaction, Learning, and Student Satisfaction." *IEEE Transactions On Systems, Man, and Cyernetics—Part A: Systems and Humans* 36 (6), November.

Sun, Pei-Chen, Ray J. Tsai, Glenn Finger, Yueh-Yang Chen, and Dowming Yeh. 2007. "What Drives a Successful e-Learning? An Empirical Investigation of the Critical Factors Influencing Learner Satisfaction." *Computers & Education*, in press.

Terry, N. 2001. "Assessing Enrollment and Attrition Rates for the Online MBA." *T.H.E. Journal*, in Meyer, Katrina A., Janis Bruwelheide, and Russell Poulin. 2006. "Why They Stayed: Near-Perfect Retention In An Online Certification Program in Library Media." *Journal of Asynchronous Learning Networks* 10 (4), December.

Tinto, Vincent. 1998. "Colleges As Communities: Taking Research on Student Persistence Seriously." Review of Higher Education 21 (2), in Meyer, Katrina A., Janis Bruwelheide, and Russell Poulin, "Why They Stayed: Near-Perfect Retention In An Online Certification Program in Library Media." *Journal of Asynchronous Learning Networks* 10 (4), December.

Willging, P.A., and S.D. Johnson. 2004. "Factors That Influence Students' Decision to Dropout of Online Courses." *Journal of Asynchronous Learning Networks*. 8 (4), in Meyer, Katrina A., Janis Bruwelheide, and Russell Poulin. 2006. "Why They Stayed: Near-Perfect Retention In An Online Certification Program in Library Media." *Journal of Asynchronous Learning Networks* 10 (4), December.

Yang, Yi, and Linda F. Cornelius. 2004. "Students' Perceptions Towards the Quality of Online Education: A Qualitative Approach," Association for Educational Communications and Technology, 27th, Chicago, IL, October 19–23.

Ethical, Academic, and Practical Considerations for Online Teaching: Does the Search for Quality and Integrity Come at the Expense of Academic Freedom?

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Abstract
The Internet has evolved to be the new revolution in educational delivery. A 2008 Sloan Consortium report on the state of online education in the United States revealed some startling information. For example, at the turn of this century approximately 10 percent of post-secondary enrollments at degree-granting institutions were in online courses or programs; but, by 2007, the number had grown to over 20 percent. This growth translated into an average annual increase of nearly 20 percent at a time when overall enrollment growth in higher education averaged only around 2 percent. Schools recognized that students were voting with the click of a mouse, and, by 2007, the percentage of schools defining online education as critical to their long-term strategy had grown to more than 70 percent of public institutions and more than 53 percent of private colleges and universities. Online courses and programs are now offered by universities large and small, including many of the nation's most prestigious schools. As schools throughout the nation have looked to the rapidly evolving technological medium as a solution to education delivery challenges and as a way to expand existing education markets, the medium and its accompanying technologies have evoked mixed reactions among students, administrators and faculty. The pervasiveness and visibility of online instruction has served not only to magnify its strengths (e.g., the benefits that accrue to an asynchronous format) but to reveal areas of concern (e.g., maintaining academic/ethical integrity, especially in online testing, and issues relating to oversight and academic freedom) as well. It is the purpose of this paper to illuminate and elaborate on these complex issues from administrative, practical, ethical and academic perspectives, with a view toward generating further discussion on overcoming the evolving tensions related to online teaching.

KEY WORDS: Academic integrity; online learning; academic freedom; asynchronous learning; testing integrity.

With the growth of online education delivery, the face of public administration education is changing. By the change of the millennium, the Internet had clearly evolved to be the new revolution in educational delivery. Online learning at the post-secondary level has come of age. A 2008 Sloan Consortium report on the state of online education in the United States revealed some startling information. For example, at the turn of this century approximately 10 percent of post-secondary enrollments at degree-granting institutions were in online courses or programs, but by 2007 the number had grown to over 20 percent. This growth translated into an average annual increase of nearly 20 percent at a time when overall enrollment growth in higher education averaged only around 2 percent. Schools recognized that students were voting with the click of a mouse and by 2007 the percentage of schools defining online education as critical to their long-term strategy had grown to more than 70 percent of public institutions and more than 53 percent of private colleges and universities. Online courses and programs are now offered by universities large and small, including many of the nation's most prestigious schools (Allen and Seaman 2008).

Another major change in higher education that has impacted the proliferation of online courses and programs has been the growth of competition. The limitations of geographical location have largely been erased via the Internet. Competition for students in online courses, as well as the proliferation of online offerings, has been especially intense among schools providing educational opportunities for enlisted members of the military. Due to their deployment challenges, the military relies on online programs, which are used to support military recruiting and retention and to provide crucial professional development for service members.

Schools throughout the nation have looked to this evolving technological medium as a solution to education delivery challenges and as a way to expand existing education markets. The MPA-IG (Inspectors General) program at John Jay is such an example; that particular program even requires student attendance at a conference of the Association of Inspectors General (Hamilton 2010).The focus on technology and its inherent flexibility has evolved to the point where some schools offer courses to be completed on handheld personal digital devices (Meine 2008). Despite this rush to distance learning, the medium and its accompanying technologies have evoked mixed reactions among students, administrators and faculty, and have created a number of new challenges.

It is clear that regardless of the reactions to online distance learning as a delivery system, its use is expanding at an extraordinary pace. As Internet-based education has transitioned from its initial status as "the classroom of the future" to a pedagogical mainstay, it has been subjected to significant scrutiny by its proponents and detractors alike. Unlike its most prominent predecessors in distance education (e.g., telecourses and correspondence courses) the pervasiveness and visibility of online instruction have served to magnify its strengths (e.g., the benefits that accrue to an asynchronous format) as well as its weaknesses (e.g., maintaining academic integrity, especially in online testing).

For the delivery of academic information online to have become not only a viable, but highly regarded and widely utilized pedagogy, the technology had to be affordable, efficient, and user-friendly for all stakeholders. As a result, and by necessity, the initial concerns were focused on the efficacy of such entrepreneurial systems as WebCT and Blackboard. Once most of the concerns regarding delivery technology were resolved, a number of significant unanswered logistical and academic questions began to emerge. With these thoughts in mind and considering the rapid academic migration to online education, now might be the opportune, if not overdue, time to examine the issues that are likely to impact the future directions of Internet-based instruction.

Academic Issues and Concerns

Having been actively involved for more than 15 years with the proliferation of Internet-based, post-secondary instruction, as both online instructors and administrators responsible for development and supervision of online courses and programs, it is the authors' contention that a number of important issues are yet to be addressed.

Given the rapid rise in the popularity of online courses including so-called "hybrid or blended" (some mixture of face to face and online delivery) courses, there appears to be a significantly different, arguably even disproportionate degree of oversight of instructors teaching online courses compared to those teaching in the traditional in-class formats, even when the instructors are the same individuals teaching the same course. As a result, there appears to be a growing belief that faculty autonomy is being subjugated to administrative imperatives in the

oversight of online courses vis-à-vis their in-class counterparts. Perhaps of equal importance is the well-publicized concern that online courses, by their very nature are inferior to their in-class counterparts (Stross 2011), a concern that has been translated into differential policies concerning federal support for students pursuing online programs using federal student aid, and in recent veterans education funding programs. Not surprisingly, suggestions that various aspects of online courses might actually be superior to their traditional counterparts (e.g., the Discussion Board, a marquee component of online courses which, unlike the vast majority of in-class discussions, can be structured so that every student in the class, and not just a verbose few, actively participates in the discussion) are rarely mentioned and, if so, are often summarily dismissed, despite the fact that a study by the US Department of Education suggests that online classes, whether taught completely online or blended, produce stronger student learning outcomes than do classes with solely face-to-face instruction (Means et al. 2010, 18).

Faculty Concerns

1. Increased workload and effort to develop and conduct online courses as noted during a 2008–09 survey of over 10,000 faculty members (Faculty Views about Online Learning 2010).

2. Differential criteria for evaluating instructors, developing syllabi and establishing exam parameters.

3. Difficulty in obtaining adequate numbers of student evaluations resulting in inequities in evaluating faculty performance. Whereas in traditional classes there can be a reasonable assurance that most or all students complete an evaluation, online evaluation responses tend to be meager at best.

4. Differential processes for the handling of student complaints and for academic advising.

5. Inequities in the use of "Administrative Privileges" for observing an instructor's performance in the "classroom."

6. Administrative influences on course content (e.g., requiring "group projects" and attempts to mandate discussion processes and response times) and for example limiting the desired ability of faculty to retain their freedom to design their courses as they see fit.

7. Mandated examination and proctoring processes to include examination length and timing.

8. The imperative that distance learning instructors undergo specialized training, complete with competency testing for technological "innovations."

9. Inequities in course scheduling and student enrollment parameters and online posting of individual syllabi for multiple sections of a course, which enables students to opt for sections with less rigorous requirements (some of which may be taught by part-time faculty who perhaps may be of the opinion that maintaining their popularity with students is a necessity for their continuing employment).

10. Extensive use of adjunct/part-time faculty who are often not located on or even near the school in question, resulting in inequities for office hours and administrative requirements.

11. Differences in office hour and administrative requirements for full-time online versus full-time in-class faculty.

12. Pressure to include attractive "bells and whistles" in the delivery of online courses, which, when included in the Student Evaluations, can potentially and differentially influence the perception of faculty performance in the eyes of students and administrators.

13. The continuing debate about quality differences between online and face-to-face courses, with each side claiming inferiority of the other (Milliron 2010).

14. Professors having their teaching practices evaluated by non-faculty, course design staff.

Administrative Concerns

1. The competitive education environment requiring new marketing strategies focused on student enrollments and retention (Aldridge 2010).

2. The pressure to ensure comparable quality of all courses, regardless of delivery format, in order to satisfy regional and specialized accreditation criteria, oversight from funding sources, etc.

3. Extensive pressure to standardize course content and formats, especially among universities that utilize large numbers of adjunct faculty to teach online courses.

4. Extensive administrative policies for ensuring that online and in-class instructors are comparably involved with their students in the teaching-learning process.

5. Questions of intellectual property ownership.

6. Concerns regarding faculty compensation and overhead costs.

7. How to equate office hour requirements in-class versus online.

8. Documenting/monitoring attendance and course participation through use of software and other methods.

9. Competing pressures with regard to policies and practices relating to online course enrollments.

Mutual Concerns

1. Relentless pressure for frequent and timely communication with students, far more frequently than might be expected in a traditional class setting, leading to an "always at work" expectation for faculty and staff.

2. The pressure to structure online courses in ways to demonstrate frequent faculty student interaction.

3. The logistical challenges for both faculty and administrators to ensure testing integrity.

4. Some of these have been addressed by creating a mandatory "meaningful convening event" whereby instructors can actually meet their online students and the students themselves can interact not only with each other by with other professional in the field. Such events also provide the opportunity for instructors to serve as proctors for their own exams (Hamilton 2010).

Student Concerns

1. The additional expense involved with online testing options, such as equipment purchases (Remote Proctor Devices) or testing fees at commercial testing centers (e.g., Sylvan Learning Centers, ProctorU).

2. Frustrations that arise when legitimate technical problems (lock outs, loss of data) occur during testing, even to the extent of students having to re-take exams.

3. Personal privacy issues that can result from the utilization of technology designed to ensure testing integrity in online courses.

4. The realization that online courses may well require more effort and self-motivation due to regular interaction requirements for each student (lack of student participation becomes obvious and is recorded in online classes).

Conclusion

While most discussion of online delivery of academic courses and programs seems to focus on quality questions, delivery and teaching strategies, and technology innovations, this paper seeks to encourage a focus on other important issues for online education as well. With the proliferation of online-based programs and courses, after having highlighted concerns regarding the differential treatment of online versus traditional classes, it is the authors' conclusion that the initiation of a more formal investigation of these issues at the graduate and undergraduate levels is not only warranted but is at least somewhat overdue. To that end, it may be the appropriate time to consider more formal data-gathering initiatives designed to determine the current status of online courses and programs, including an estimate of the number of courses (by subfield), the demographics of faculty who teach the courses (adjunct or full-time by rank), the availability of undergraduate online majors and minors as well as ascertaining the attitudes of faculty, administrators, and students regarding the quality and quantity of online courses and/or programs. It can certainly be argued that this online course and program proliferation and its

impact on faculty, students and program administration should be a matter of concern and further examination by relevant academic and professional accrediting organizations.

An important part of any such investigation should be to assess if there is a disparity in the treatment of online delivery versus face to face, and if so why. In other words, is there distrust of the online environment in the academy, and is there cause for concern or is the issue just a resistance to or concern about change. This evaluation is critical in the face of the rush to online education noted at the beginning of this paper.

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References

Aldridge, Susan C. 2010. "Strategy Matters More Than Budget in Online Education." *The Chronicle of Higher Education*, October 31. http://chronicle.com/article/Strategy-Matters-More-Than/125113 (accessed April 7, 2011).

Allen, Elaine, and Jeff Seaman. 2008. *Staying the Course: Online Education in the United States, 2008*. Needham, MA: Sloan Consortium.

Faculty Views About Online Learning. 2010. *The Chronicle of Higher Education*, October 31. http://chronicle.com/article/Faculty-Views-About-Online/125200/ (accessed April 12, 2011).

Hamilton, Jay P. 2010. "Lessons Learned from the National Online MPA-IG Program at the John Jay College of Criminal Justice." *PA Times Education Supplement*, October 2010, pp. 4, 6.

Means, Barbara, Yukie Toyama, Robert Murphy, Marianne Bakia, and Jones Karla. 2010. *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.* Washington, DC: U.S. Department of Education Office of Planning, Evaluation, and Policy Development, Policy and Program Studies Service.

Meine, Manfred F. 2008. "The Changing Face of Education—Distance Education and the Military." *Military Advanced Education*, March/April 2008.

Milliron, Mark D. 2010. "Online Education vs. Traditional Learning: Time to End the Family Feud." *The Chronicle of Higher Education* October 31. http://chronicle.com/article/Onilne-vs-Traditional/125115 (accessed April 7, 2011).

Stross, Randall. 2011. "Online Courses, Still Lacking That Third Dimension." New York Times, February 5. http://www.nytimes.com/2011/02/06/business/06digi.html?_R=2 (accessed April 15, 2011).

Asynchronous Online Education Credit Hours by the Book

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Abstract
A study of U.S. Department of Education (DOE) and accrediting commissions' policies was conducted to learn how the credit hour metric is applied to asynchronous online education. No research was found addressing this issue. Findings indicate that the credit hour definition and use are not uniform and that local institutions and faculty are most responsible for credit hour determinations. Also indicated by data is that an alternative metric is possible since the credit hour is an inappropriate system.

Introduction

The history of higher education in the United States includes providing alternative access for adult learners. Distance education is one such format. Over the years, learning at a distance used correspondence, off campus lectures, community-based events, and many other practices. A contemporary distance education modality is commonly known as online education. Using computer technologies and Internet access, learning is made possible through asynchronous courses in which instructor and learners are separated by time and space. Enrollment in asynchronous online education continues to increase, and more courses and degrees are being offered to meet learners' needs. Therefore, examination of policies is warranted to ensure just and equitable credit hour praxis.

Another historical element found within American education is the use of the credit hour system. Originally named the Carnegie Unit, the credit hour has been used for over a century within the U.S. education system. One credit hour is traditionally defined as one instructional hour in a classroom setting with instructor and learners. A commonly practiced application of a credit is for each hour of classroom instruction that a learner would spend a minimum of two hours of study or preparation resulting in three learning hours per credit hour. Since its adoption into the American education system, the credit hour meaning has remained static. Additionally, the credit hour now provides a metric for more than learning. Credits are used to set budgets, faculty work load, financial aid, and other administrative measures.

Problem and Purpose

Education is no longer limited to the traditional face-to-face classroom with teacher and students together. Instead, learning is possible through a format such as asynchronous online education. Because of its differences, online learning has been scrutinized and evaluated against traditional education. Asynchronous online education does not include the measurable class time, or seat time, for which the credit hour is based. Credit hour values are assigned to online courses although there was no definable contact or seat time hours. No research was found that addressed the translation of asynchronous online education into credit hours.

Therefore, a study was conducted to determine how "class time" for asynchronous online higher education courses was determined. Specifically, the question raised: What methods do national and regional accrediting commissions' policies set forth for translating asynchronous

online education into credit hours? Examination of the U.S. Department of Education and the six regional accrediting agencies' policies and documents was conducted. Interviews with persons representing the various organizations were conducted and used to triangulate findings from policies and documents.

During the last part of the study, the U.S. Department of Education released the Program Integrity Issues (2010) ruling. The regulation was issued to address several concerns within higher education and included placing a definition of a credit hour into federal rules. Information pertinent to this study from the ruling was integrated into the findings discussed in the following sections.

Review of Literature

A review of pertinent literature began the project. Readings found were from library sources and databases. One search focused on credit hour definition, use, and practice. An additional search conducted pertained to asynchronous online education. This search was found limiting and was widened to incorporate distance education with attention to online learning. Throughout the process, synonyms of the two primary subjects, credit hours and asynchronous online education, were used to create the broadest search and review possible. A guiding principle of the review was how online education courses were associated with credit hours. The relevant information is provided in the subsequent sections.

Credit Hour Definition. The late 1800s and into the early 1900s, American education experienced several changes that caused lasting effects. The United States Bureau of Education was formed in response to the creation of land grant universities by the *Morrill Act* (1862). Subsequently, centralized governance and standards for education began to develop providing the foundation for the U.S. K-12 and higher-education systems known today. This transition also provided reason for the National Education Association's recommendations to address the need for standards and minimal requirements for enrollment in secondary education. A standard of 14 units of credit became required for college entrance with each unit of credit equaling a minimum of 130 instructional hours (Heffernan 1973; Lorimer 1962; Shedd 2003a; 2003b; Wellman and Ehrlich 2003a; 2003b; Wolanin 2003). The 14 units were equivalent to four years of high school education. Also, each unit represented an instructional hour. The units were designed to provide a uniform process of measuring learning between all schools.

According to the Carnegie Foundation (2008) and Maeroff (1994), the Carnegie Foundation for the Advancement of Teaching greatly influenced adoption of the National Education Association's standard units. The Foundation stipulated that institutions had to use what became known as the Carnegie Unit in order to receive funding for teacher pensions. The Carnegie Unit, according to Shaw (1993) and Watkins (1991), promoted and established national education standards and uniformity to the length of classes, school terms, and admission standards. The traditional five 40–55 minute classes per week became part of American education. Mullin (2001) further indicated that because of the ease of use, the credit hour quickly became a vital part of the U.S. education system and used for administrative decisions such as budgets and faculty work loads.

Asynchronous Online Education. Remote or distance learning is not new to higher education. Other modalities include correspondence, the Lyceum movement, Chautauqua, Society to Encourage Studies at Home, Correspondence University, and Extension services (Larreamendy-Joerns and Leinhardt 2006; Pittman 1991; Watkins 1991). VanKekerix and

Andrews (1991) discussed how technology impacted on educational offerings along with the various results. In the 1990s, the introduction of the Internet brought a shift in distance education (Eaton 2002; Shale 2002; Web-Based Education Commission 2000). Online education is a mix of human–computer interaction, cognitive science, and instructional technologies (Distance Learning Task Force 1999; Hrastinski 2008; Parsad, Lewis and Tice 2008). For this discussion, the definition of online education provided by Parsad et al. (2008) is used:

"formal education process in which the student and instructor are not in the same place, thus, instruction may be synchronous or asynchronous, and it may involve communication through the use of video, audio, or computer technologies" (p. 1).

Martindale and Ahern (2001) discussed how online education provided an alternative format and access to higher education. The new system, according to Wingard (2004), provides the opportunity for learners with Internet access and computer to acquire educational materials nearly any time and any place.

The Web-Based Education Commission (2000) projected that online nontraditional adult (age 25 years and older) enrollments would steadily increase. In a report for the National Center for Education Statistics, Parsad et al. (2008) reported for the academic year 2006–2007 that 29% of 4,200 surveyed institutions made available degree programs online. From those same institutions 17% offered online certificate programs. More recently, Allen and Seaman (2010) indicated how online education enrollment during 2008 increased 17% over 2007 online education enrollments. Snyder, Dillow and Hoffman (2008) indicated that technologies and online education were better suited to meet busy adult learners' needs in a rapidly changing society and workplace by reducing barriers of time and place. Discussion provided by Abel (2005) and Martyn (2003) described how employees were expected in today's global market to obtain quality education quickly. Abel (2005), Lim, Morris, and Kupritz (2006), and Martyn (2003) also discussed how asynchronous online education may meet modern learning needs because of flexibility in scheduling and the possibility of "just-in-time" learning.

Incompatibility with the Credit Hour. Asynchronous online education is not based on a time measurement or set instructional time and place. Paradoxically, credit hours are designed on a measurement of instructional time in a designated place, but are used to measure asynchronous online education. The concern, therefore, is the awarding of credit hour values to instructional forms that do not have a set class time or a measurable amount of instructional time. Eaton (2002) emphasized how contemporary courses such as asynchronous online education no longer fit the definition of a credit hour, and thus cannot be measured in that way. Similarly, Meyer (1975) argued that credit hours do not measure learning and cannot justifiably do so with nontraditional education.

In 2009, Scott, Office Inspector General of The United States Department of Education issued two memorandums concerning the determination and use of credit hours. The first went to the Middle States Commission Higher Education. The second was issued to Commission on Colleges of the Southern Association of Colleges and Schools. Scott (2009b; 2009c) reported to both commissions that there were insufficient guidelines in place to assure that credit hour values were consistent and met minimal requirements. A third memorandum by Scott (2009a) addressed to the Higher Learning Commission of the North Central Association of Colleges and Schools, reported that the Higher Learning Commission did not provide sufficient guidance for credit hour determinations. As a result, the commission could not guarantee the quality of education.

Methods

Policy and document analyses were determined appropriate for this study addressing the research question: What methods do national and regional accrediting commissions' policies set forth for translating asynchronous online education into credit hours? In addition to the U.S. Department of Education, the six regional accrediting commissions were used in this project. The agencies included: (a) Middle States Association of Colleges and Schools; (b) New England Association of Schools and Colleges, Commission on Institutions of Higher Education; (c) North Central Association of Colleges and Schools, The Higher Learning Commission; (d) Northwest Commission on Colleges and Universities; (e) Southern Association of Colleges and Schools, Commission on Colleges; and (f) Western Association of Schools and Colleges, Accrediting Commission for Senior Colleges and Universities (U.S. Department of Education 2009).

Commissions' policies and documentation were expected to reveal the current standards and praxis of assigning credit hour values to asynchronous online education. This procedure would allow for agency comparison and would show which commissions had existing policies and practices. Additionally, this method allowed for understanding of current educational circumstances. The content of the policies and documents provided a collection of descriptive data. Each of the commissions was examined in a "systematic, purposeful, and disciplined process of discovering reality" (Merriam and Simpson 2000, 5) concerned with credit hour production and use with online education.

Policy analysis, as a formal discipline in education (Musick 1998), is comparative in nature by reviewing one document against another (Musick 1998; Rose 2002). Musick (1998) also defined this method as an evaluation of programs, policies, and methods relational to the proposed outcome and its impact. Smith (2002) reiterated the point by indicating analysis and evaluation cannot occur without the other in understanding all the dynamics of policy and use. Collecting policies and documentation in a rigorous and systematic form permitted the researcher to generate a scientific understanding from data (Bogdan and Biklen 2007; Hesse-Biber and Leavy 2006).

Semi-structured interviews were conducted with a purposeful sample comprised of regional accrediting commission persons to triangulate findings from policies and documents. Collecting information from more than one source allowed the researcher to determine trustworthiness of data (Bogdan and Biklen 2007; McCulloch 2004). Through interviewing persons directly related to the subject, the researcher was able to add another layer of data comparison and deeper understanding (Denzin and Lincoln 1994). In order to protect confidentiality, persons interviewed were assigned a designation of 'P' followed by a randomly assigned two-digit number. Although separation of persons from their respective commission was not completely possible, all efforts were made to protect participant confidentiality by removing any identifying characteristics from the transcribed text and any quotations used in this report.

Guiding questions were used during data collection and interviews. The questions were designed to provide data relevant to the research purpose and to provide structure to interviews. Also, the questions assisted in the research to learn how agencies guided its organizations in credit hour value assignment to traditional and online education. These directive questions were: (a) Did the agency provide a published definition of the credit hour to its institutions/organizations? (b) What published policies did the agency have for calculating credit hour value for traditional and asynchronous online education courses? (c) In the absence of published materials, what were established guidelines and practices to address the above

questions? (d) Who was responsible to ensure consistent application and use of credit hours? (e) As related to credit hour values, what changes did the organization foresee, or made, as the result of the U.S. Department of Education's *Program Integrity Issues: Final Rule*, October 29, 2010 (34 CFR Parts 600, 602, 602, etc.)?

Results

The purpose of this study was to determine what policies exist to guide the translation of asynchronous online education class time into credit hours. This report provides the results from data collected from the U.S. Department of Education and the six regional accrediting commissions. Collection and analysis of data occurred by a systematic search of agency policies and documents. Interviews of regional persons were conducted in order to validate findings from policies and documents. There are three primary findings from data collected. These discoveries are presented in the following sections and organized by credit hour definition, responsibility for credit hour determinations, and translation of credit hours for asynchronous online education. (As a reminder, in order to protect interview participants' confidentiality the letter 'P' followed by a randomly assigned number distinguishes interview participants.)

Credit Hour Definition

Understanding the meaning and use of credit hours was crucial for this study. During the research, many details were found that were not discovered in the literature review. Literature and research data provided an enlightened understanding of credit hours and use with asynchronous online education. A common understanding of credit hours was found. However, variations on the use and interpretation of credit hours occurred due to credit hour determinations made with subjective elements. In other words, comparing similar classes between institutions most often did not exactly correspond resulting in interpretive differences on credits and the course content.

As discussed, the Carnegie Unit became what is known today as the credit hour. A credit hour, in general, is one instructional hour plus two student study hours per course per week for the term, which equated to 45 learning hours per credit hour (U.S. Network for Education Information 2008b; 2008c). One definition read that a credit was the representation of "a mathematical summarization of all work completed, and are not the same as the actual classroom contact or instruction hours" (U.S. Network for Education Information 2008c, 2). The Middle States Commission on Higher Education (2009d) indicated that students received credits when successfully completing courses. More detailed information from Middle States Commission on Higher Education defined a credit hour as *"a unit of measure representing the equivalent of an hour (50 minutes) of instruction per week over the entire term"* [italics in original] (2009d, 49). Another commission indicated that credit hours were a measure of "engaged learning time expected of a typical student" (New England Association of Schools and Colleges Commission on Institutions of Higher Education 2005, 1). P11 discussed that the credit hour "is a commonly accepted quantification of academic learning." Further explanation included references to the commission's documents. P11 specified that all credit hours had to be "consistent with institutional policies that reflect generally accepted norms or equivalencies in higher education." During interviews, participants clearly indicated that one credit should equal a minimum of one instructional hour per week per term. Half of the participants included student study time, which

totals 45 learning hours per credit per week per term (P11, P15, P21). The allotment of 45 hours per week was also found in commissions' documentation (Middle States Commission on Higher Education 2009d; New England Association of Schools and Colleges Commission on Institutions of Higher Education 2005; Northwest Commission on Colleges and Universities 2010). The Higher Learning Commission and Commission on Colleges did not specifically provide a credit hour definition. During interviews, P13 and P15 discussed how the credit hour does not properly measure learning and that their commissions placed focus on learning outcomes.

Found in the Middle States Commission on Higher Education (2009e) documentation defined five types of credit hours and the related learning format. First, a laboratory credit hour would include class or lecture with designated time for student work in a laboratory setting and student study time. A second type, practice credit hour, would have supervised clinical experience, teaching, fieldwork, and visual or performing arts. Third, an internship was comprised of an established set of time and duties followed by an assessment of student work. Fourth, an independent study credit hour was negotiated time and outcomes between an instructor and student. Fifth, competency-based credit hours were explained as a collaborative effort between instructor and student to meet predefined objectives that may or may not have a defined time for completion. Specific traits of these descriptions were the amount of time allotted for each instructional format.

Lecture or seminar credits had one hour of instruction plus two hours of student study each week resulting in 45 learning hours per term per credit hour. This follows the traditional credit hour definition explained previously. Laboratory courses required more learning time. It was explained that one instructional hour plus two student study hours plus one to two additional hours in the laboratory each week. This format required 60–75 learning hours per term per credit hour. Instructional credit hour types for internship and independent study required three to four independent and/or supervised work totaling 45–60 learning hours per term per credit. Finally, learning time associated with competency-based credit was explained as relevant time for student completion of work to meet course objectives. Similar findings were in the Department of Education's information provided through U.S. Network for Education Information (2008a; 2008b; 2008c; 2008d). The New England Association of Schools and Colleges Commission on Institutions of Higher Education (2005) data. Classroom credit hours were explained as a combination of instruction and student study to equate 45 hours per term per credit. Experiential learning credits were to be a minimum of 45 learning hours per term per credit. The Northwest Commission on Colleges and Universities (2003; 2010) was similar to New England, but provided the range of 40–45 learning hours per term per credit. Specific information was not found in Western Association of Schools and Colleges Commission for Senior Colleges and Universities documents'. However, P11 described 40–45 learning hours per term per credit as the norm for the region and no distinguishing between classroom and non-classroom credits. The North Central Association of Colleges and Schools—Higher Learning Commission and Southern Association of Colleges and Schools Commission on Colleges did not have specific time assigned to credit hours. In both documentation and interviews, the emphasis was on learning outcomes and that schools were required to associate learning to commonly expected credit hour practices.

Following the *Program Integrity Issues* (2010) ruling a credit hour became the intended amount of work that occurs within one classroom instructional hour plus two student study hours resulting in 45 learning hours per term per credit. For other instructional modalities, such as

laboratory, studio, practicum, and the like, one credit hour was defined as the represented learning that would occur in a minimum of 45 learning hours per term. The text of the ruling also indicated "credit hours at one institution will not necessarily equate credit hours at another institution for a similar program" (Program Integrity Issues 2010). Further description elaborated that the new flexibility provided minimal basics so that credit hours would be more equitable between institutions. The ruling and the new credit hour definition were clarified more in a letter from Ochoa (2011), U.S. Department of Education Assistant Secretary, Office of Postsecondary Education. In the letter, Ochoa described the new credit hour definition as noninvasive and that it removed the former credit hour's "seat time." Thus, institutions were permitted the freedom in instruction as long as the learning outcomes and achievement were reasonably equal to the learning of one instructional hour and two student study hours per week per credit. The new credit hour definition did require assessment showing student achievement as related to learning outcomes.

P11 discussed during the interview how the credit hour was based not only on time, but also on "commonly accepted quantification of academic learning." Another characteristic of credit hours was how an institution's credits had to be "consistent with institutional policies that reflect generally accepted norms of equivalencies in higher education" (P11). This was similar to documentation as institutions were obligated to assign "academic credits based on generally accepted practices in degree-granting institutions of higher education" (Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities 2010b, 7). The commission provided peer reviewers the "Eligibility Review Panel Scoresheet" to use during an institution's review (Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities 2010a). Reviewers would rate a school's ability in meeting various principles listed on the form. One of the criteria rated an institution's documents concerning assignment of credit hours included criteria that "represent good practice in higher education" (p. 2). The Middle States Commission on Higher Education (2009a) provided discussion about credit hours and related course work. Institutions were required to ensure that "appropriate academic content, breadth, length, and rigor" (p. 4) were provided in all courses and associated credit hour assignments.

Responsibility

The accreditation process found in American education is unique. Accrediting commissions and the Department of Education (DOE) act as overseers to ensure that standards are maintained. It is through a self-evaluation and peer review process that evaluation of institutional compliance to standards occurs (Middle States Commission on Higher Education 2002; New England Association of Schools and Colleges Commission on Institutions of Higher Education 2009a). The system places great responsibility at the local level for providing quality education. Decisions are made concerning courses and credits through faculty, curriculum committees, and institutional administration. In essence, each institution maintains the most control and duty for credit hours and related learning.

Each institution has its own process for developing, reviewing, and approving course work and credits. When accreditation reviews occur, institutions are evaluated on how well standards are met relational to the school's mission and purpose. Peer reviewers assess credit hours, course content, instructional formats, assignments, and assessments (Middle States Commission on Higher Education 2002; New England Association of Schools and Colleges

Commission on Institutions of Higher Education 2009a). This was emphasized by P21 when discussing how each institution was reviewed based on its mission and goals comparative to how well appropriate content, learning outcomes, varied assessment methods, and qualified faculty for subject and teaching are used to ensure quality education. Explained by P15, standards were in place to establish minimal requirements and expectations for attainment. The Southern Association of Colleges and Schools' "Principles of Accreditation" (2009) indicated established standards for the region's institutions. Wheelen (2009), then president of Southern Association of Colleges and Schools, responded to a report issued by Scott (2009c), Assistant Inspector General, U.S. DOE. In the letter Wheelen stressed that the commission, through evaluations and peer reviews, held "institutions accountable for the academic quality of ***any and all*** [emphasis in original] course work or credit recorded" (p. 2) by a school. It is through the peer review process that quality education is ensured and is related to the institution's mission. Peer reviewers evaluate an institution's courses and learning outcomes and degree programs are suitable for the collegiate level (Wheelan 2009).

Although responsibility for determining credit hour values and maintaining academic rigor was at the institution level, the accrediting commissions were liable for ensuring compliance to prescribed standards. Credit hour variance between institutions was expected. Within New England commission's documentation, discussion on how peer reviews work in favor of supporting quality education. Yet, the commission realizes that the accreditation and review process are "not an equalizing force, measuring every institution by a uniform set of quantitative standards" (New England Association of Schools and Colleges Commission on Institutions of Higher Education 2009a, 4). The DOE explained that credit hours would vary. The reliance of following acceptable higher-education practices permitted variance, but assumed basic academics were compatible (U.S. Department of Education 2010a; U.S. Network for Education Information 2008b).

The Western Association of Schools and Colleges require institutions to prove themselves and that "academic credits [are] based on generally accepted practices" (Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities 2010b, 7). As with other commissions, the Western Association requires institutions to demonstrate that any alternative instructional format is comparable to traditional in-class learning (Council of Regional Accrediting Commissions 2009; Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities 2010c). Institutional proof and demonstration was also required in New England (2009a; 2009b) and Middle States (2009a; 2009b; 2011b) associations. At the institutional level decisions are made that impact on credit hours and the associated learning. The regional commissions then evaluate institutional determinations and practices to ensure quality education.

As presented, the responsibility of credit hours is at the local level. A common theme in the interviews is that accreditation reviews look for the appropriate academic content and rigor. P13 discussed at length the importance of awarding accreditation based on how well institutions meet learning objectives appropriate to the academic level. P11 also emphasized many times that "content and rigor" were the focus of the region's evaluations. Both Manning (2009; 2011a; 2011b) and Wheelan (2009) described how each region, respectively, was more concerned about learning and outcomes. Accreditation reviews would assess each institution's ability to provide appropriate academic content, length, and rigor in curricular choices. Although credit hours were used as a metric, reviewers looked for demonstrated evidence that an institution's choices were comparable to other higher-education institutions.

Translation Policy

The third finding of the study was that no policy or practice translating asynchronous learning into credit hour values was found. Documentation and responses from interviews indicated that online education followed the same process as classroom instruction. More specifically, online courses used classroom curricula and standards to promote the same rigor and content as traditional learning.

Accreditation standards of the Middle States required that all instructional modalities were "comparable to those offered in more traditional formats" (Middle States Commission on Higher Education 2002, 44). Other documents indicated that institutions were solely responsible to ensure all educational formats met the same standards found with traditional classroom learning (Middle States Commission on Higher Education 2009c; 2011a; 2011b). The Northwest commission required schools to maintain the same academic standards regardless of delivery format and that institution could equate its course work to commonly held praxis (Northwest Commission on Colleges and Universities 2003) ensuring "both the rigor of the programs and the quality of instruction" (p. 45). Additionally, the learning time would be equitable to three hours of student work (Northwest Commission on Colleges and Universities 2010).

How credit hours were not appropriate as a metric for learning was discussed during the exchange with P15. Instead, the commission, regardless of the instructional format, would focus on learning outcomes, course content, and rigor. Similar statements were found in documents by Manning (2009; 2011a; 2011b) representing the North Central Association and Wheelan (2009) from the Southern Association. Proposed North Central Association standards changes included that all educational modalities would maintain the "substance, rigor, and relevance appropriate to its mission and to higher education" (North Central Association of Colleges and Schools—Higher Learning Commission 2011a, 5). P11 and the related association documents also required institutions to ensure online courses were comparable to traditional classroom instruction (Council of Regional Accrediting Commissions 2009; Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities 2010c). Institutions were required to demonstrate for all learning formats that content and rigor were comparable with standards and commonly held higher-education practices (P11).

Discussion and Conclusion

The purpose of this study was to learn what national and regional policies exist to translate asynchronous online education into credit hour values. Knowledge of the credit hour meaning and use was required in order to understand what is stated in policies and how credit hour determinations are made. Data collected from documents and during interviews indicate three factors: (a) credit hours measure time and not what is learned; (b) responsibility for choosing credit hour values is at the local institution level; and (c) no policy exists that translate asynchronous online education into credit hours. During data analysis a theme emerged in documentation and discussed greatly during interviews that indicate an alternative metric is possible.

The credit hour measures the amount of learning time involved. This is learning traditionally based on one hour of classroom instruction plus two student study hours per credit per week each term. This has remained static since the introduction of the credit hour and continues through the most recent definition published by the U.S. DOE's *Program Integrity Issues* (2010), which did not alter the time element within the U.S. education system. Instead, the

ruling indicated the amount of learning involved in three learning hours (one instructional hour plus two student study hours) would be the basis for one credit hour. Criteria for a credit hour must now be quantified by "intended learning outcomes and verified by evidence of student achievement" (Program Integrity Issues 2010). Ochoa (2011) explained in a *Dear Colleague Letter* that the ruling did not drastically change existing practices. Rather, the ruling emphasized the importance of learning content, outcomes, and assessment, but continued to use the credit hour as metric that "is a proxy measure of a quantity of student learning" (Ochoa 2011, 2).

Greatest responsibility for credit hours is on the local institution: faculty, committees, and administration. The DOE reaffirmed local duty in the *Program Integrity Issues* (2010). Also, the DOE reiterated that accrediting commissions were obligated to ensure member institutions were meeting standards. The DOE's ruling also requires institutions and commissions to have procedures in place indicating how consistent credit hour choices are made. Within commissions' policies, institutions were required to have policies for their credit hour decisions and proof that demonstrated their values were acceptable to higher-education practices. Information was not found in data that would equate how much learning should occur within the time associated with credit hours. Instead, continued propagation of arbitrary measures of rigor, robust, appropriate content, and consistent with higher education praxis were assigned to learning and related credit values. Commissions and the DOE expect that choices made about course work and credits assigned would vary, as persons would make judgments based on perception of academic offerings. In fact, this same point was made by Manning (2009; 2011a; 2011b) and Wheelan (2009) when giving response to the DOE's assessment of commission policies and determinations.

Actual translation policies were not found. Instead, institutions were required to ensure that any instructional format met the standard of classroom learning. This practice is the foundation of the DOE's *Program Integrity Issues* (2010). All learning, as defined in the ruling, must be equivalent to the learning that would occur within one instructional hour and two student study hours. This is the same parameters of the traditional credit hour and is set as a benchmark for measuring U.S. education. Therefore, the credit hour, as historically defined and used, continues to be the metric of the U.S. educational system.

A prevalent theme occurred during the course of the study that may provide an alternative to the credit hour metric. The subject was found in commissions' documents, but became prevalent during interviews. Data indicate that using outcomes or competencies based metric is being voiced and is a theoretical element of accreditation review and credit hour definition. The challenge, however, is for institutions and agencies to concretely associate competencies to credit hour values. No benchmarks were found, nor how much learning should occur within credit hour parameters.

The Middle States commission included in its standards that student learning was measurable by "learning goals and objectives, including knowledge and skills" (Middle States Commission on Higher Education 2002, 39). Other data found that appropriate higher-education knowledge, skills, and competencies were assessed to ensure quality education (Middle States Commission on Higher Education 2002; 2011a). In a similar manner the Northwest commission required members to ensure that rigor and content were acceptable for academic level and followed common higher education practices (Northwest Commission on Colleges and Universities 2003). During the interview, P21 discussed how student learning and outcomes were important factors of higher education and accreditation. The Southern Association also relied on outcomes as an important basis of standards. This was most evident in the communication

between DOE and Wheelen (Scott 2009c) discussed previously. In response to a DOE report, Wheelen (2009) stated that the region placed emphasis on learning and that institutions were held accountable for their academic offerings. An institution's course work and learning outcomes were evaluated during peer review processes.

Two regions clearly indicated the importance of learning over credit hours. The North Central and Western Associations incorporated review of student learning, course objectives, and assessments as part of accreditation reviews. The North Central commission proposed a standard change to specifically address course substance and rigor. The new standard would require institutions to demonstrate appropriate academic caliber and level through stated core competencies and proven by student assessments (North Central Association of Colleges and Schools—Higher Learning Commission 2011a). During the interview, P13 elaborated that the commission was focused on student learning and that the amount of time spent "learning" was not a true indicator students' gained knowledge and skills. Simply put by P13, "we are more interested in learning than in seat time." Further discussion indicated the need for a new metric that used stated objectives and competencies. The credit hour created a challenge on "how to decide when a 3 credit course has substance and rigor" (P13). Discussing more, P13 referenced the commission's standards indicating that regardless of the format learning takes place, student learning and outcomes were important for quality education. Learning methods may change, but standards provide the foundation for quality education (North Central Association of Colleges and Schools—Higher Learning Commission 2011a; 2011b; n.d.). Due to the nature of current accreditation practices and credit hour methods, the commission relied on learning outcomes when reviewing institutions. As indicated by P13, common learning standards and competencies provide instructors the foundation for courses, but allowed freedom to use multiple methods and tailor curriculum to learners. Similar discussion occurred with P11. Even though the Western Association did use the credit hour as a basic metric, according to P11, the commission focused on student learning and outcomes as an element of review. P11 referenced *How to Become Accredited: Procedures Manual for Eligibility, Candidacy, and Initial Accreditation* (Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities 2010b) during the discussion associating points made with regional policies. During this process, program goals and objectives, methodologies, course goals and objectives, and assessment that aligned with outcomes were examined closely to ensure the region's membership met accreditation standards.

The credit hour is part of the U.S. education system genetic code and has been a useful tool as the American educational structure developed and grew. Application and continued use of the credit hour may not be in the best interest of learning with the many instructional formats now available. The challenge for the U.S. education system is to make a change for a metric that is based on learning. Information gathered during this study indicates that an alternative metric based on competencies is possible. As indicated in the data, the credit hour is relied on greatly. Historically, any proposed changes and any practices were ultimately forced into the credit hour metric. Thus, perpetuating a system that has been proven as inappropriate.

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References

Abel, R. 2005. "Implementing Best Practices in Online Learning: A Recent Study Reveals Common Denominators for Success in Internet-supported Learning". *EDUCASE Quarterly* 28 (3): 75-77.

Allen, I.E., and J. Seaman. 2010. "Learning on Demand: Online Education in the United States", 2009. http://www.sloan-c.org/publications/survey/pdf/learningondemand.pdf.

Bogdan, R.C., and S.K. Biklen. 2007. *Qualitative Research for Education: An Introduction to Theories and Methods,* Fifth Edition. Boston, MA: Allyn and Bacon.

Carnegie Foundation. 2008. "The Carnegie Unit: What is it?" http://www.carnegiefoundation.org/general/sub.asp?key=17&subkey=1874&topkey=17.

Council of Regional Accrediting Commissions. 2009. *Guidelines for the Evaluation of Distance Education (On-Line Learning)*. Alameda, CA: Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities as part of Council of Regional Accrediting Commissions. http://www.wascsenior.org/findit/files/forms /C_RAC_Distance_ed_guidelines_7_31_2009.doc.

Denzin, N.K., and Y.S. Lincoln. 1994. "Introduction: Entering the Field of Qualitative Research". In *Handbook of Qualitative Research,* eds. N.K. Denzin and Y.S. Lincoln. Thousand Oaks, CA: SAGE Publications, 1-17.

Distance Learning Task Force. 1999. *Distance Learning Task Force Report*. Paper presented at the American Mathematical Association of Two-Year Colleges, Pittsburgh, PA.

Eaton, J.S. 2002. "Maintaining the Delicate Balance: Distance Learning, Higher Education Accreditation, and the Politics of Self-regulation". In *Distributed Education: Challenges, Choices, and a New Environment*. Washington, DC: Center for Policy Analysis, American Council on Education.

Heffernan, J.M. 1973. "The Credibility of the Credit Hour: The History, Use, and Shortcomings of the Credit System". *The Journal of Higher Education* 44 (1): 61-72.

Hesse-Biber, S.H., and P. Leavy. 2006. *The Practice of Qualitative Research*. Thousand Oaks, CA: SAGE Publications.

Hrastinski, S. 2008. "Asynchronous and Synchronous e-Learning: A Study of Asynchronous and Synchronous e-Learning Methods Discovered that Each Supports Different Purposes". *EDUCASE Quarterly* 31 (4): 51-55.

Larreamendy-Joerns, J., and G. Leinhardt. 2006. "Going the Distance with Online Education". *Review of Educational Research* 76 (4): 567-605.

Lim, D.H., M.L. Morris, and V.W. Kupritz. 2006. *Online vs. Blended Learning: Differences in Instructional Outcomes and Learner Satisfaction*. Paper presented at the Academy of Human Resource Development International Conference, Columbus, OH. http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED492755&site=ehost-live.

Lorimer, M.F. 1962. "How Much Is a Credit Hour?: A Plea for Clarification". *The Journal of Higher Education* 33 (6): 302-306.

Maeroff, G.I. 1994. "The Assault on the Carnegie Unit". *NCA Quarterly* 68 (3): 408-411.

Manning, S. 2009. *Letter from President*. Chicago, IL: The Higher Learning Commission. http://www.ncahlc.org/download/LettertoPresident.pdf.

Manning, S. 2011a. *Dear Colleagues*. Chicago, IL: Higher Learning Commission. https://content.springcm.com/content/DownloadDocuments.ashx?Selection=Document%2C804f71ac-fe5e-e011-bf75-001cc448da6a%3B&accountId=5968.

Manning, S. 2011b. *Testimony by Sylvia Manning, President, Higher Learning Commission, North Central Association of Colleges and Schools, before Senate Committee on Health, Education, Labor, and Pensions*. Chicago, IL: Higher Learning Commission of the North Central Association. https://content.springcm.com/content/DownloadDocuments.ashx?Selection=Document%2C9aab2893-b15f-e011-bf75-001cc448da6a%3B&accountId=5968.

Martindale, T., and T.C. Ahern. 2001. "The Effects of Three Web-based Delivery Models on Undergraduate College Student Achievement". *International Journal of Educational Telecommunications* 7 (4): 379-392.

Martyn, M. 2003. "The Hybrid Online Model: Good Practice". *Educause Quarterly* 26 (1): 18-23.

McCulloch, G. 2004. *Documentary Research in Education, History, and the Social Sciences*. New York, NY: Routledge Falmer.

Merriam, S.B., and E.L. Simpson. 2000. *A Guide to Research for Educators and Trainers of Adults*, Second Edition. Malabar, FL: Krieger Publishing Company.

Meyer, P. 1975. *Awarding College Credit for Non-college Learning: A Guide to Current Practice*. San Francisco, CA: Jossey-Bass Publishers.

Middle States Commission on Higher Education. 2002. *Designs for Excellence: Handbook for Institutional Self-Study*, Eight Edition. Philadelphia, PA: Middle States Commission on Higher Education.

Middle States Commission on Higher Education. 2009a. *ALO Newsletter: Fall 2009*. Philadelphia, PA: Middle States Commission on Higher Education. http://www.msche.org/newsletters/Fall-2009-ALO-Newsletter090911094756.doc.

Middle States Commission on Higher Education. 2009b. *Becoming Accredited: Handbook for Applicants and Candidates for Accreditation*. Philidelphia, PA: Middle States Commission on Higher Education. http://www.msche.org/publications/Becoming_Accredited_090203.pdf.

Middle States Commission on Higher Education. 2009c. *Characteristics of Excellence in Higher Educaton: Requirements of Affiliation and Standards for Accreditation*, 12th Edition. Philidelphia, PA: Middle States Commission on Higher Education.

Middle States Commission on Higher Education. 2009d. *Definitions of Higher Education and Accreditation Terms*. Philadelphia, PA: Middle States Commission on Higher Education. http://www.msche.org/documents/Glossary.doc.

Middle States Commission on Higher Education. 2009e. *Guidelines: Degree and Credits*. Philadelphia, PA: Middle States Commission on Higher Education,. http://www.msche.org/documents/Degree-and-Credit-Guidelines-062209-FINAL%5B1%5DDec09.pdf.

Middle States Commission on Higher Education. 2011a. *Distance Education Programs: Interregional Guidelines for the Evaluation of Distance Education (Online Learning)*. Philidelphia, PA: Middle States Commission on Higher Education.

http://www.msche.org/publications/Guidelines-for-the-Evaluation-of-Distance-Education.pdf.

Middle States Commission on Higher Education. 2011b. *Handbook for Periodic Review Reports*, 12th Edition. Philidelphia, PA: Middle States Commission on Higher Education.

Mullin, R. 2001. "The Undergraduate Revolution: Change the System or Give Incrementalism Another 30 Years?" *Change* (September/October): 54-58.

Musick, D.W. 1998. "Policy analysis in medical education: A structured approach". *Medical Education Online* 3 (2).

New England Association of Schools and Colleges Commission on Institutions of Higher Education. 2005. *Statement on Credits and Degrees*. Beford, MA: New England Association of Schools and Colleges Commission on Institutions of Higher Education. http://cihe.neasc.org/downloads/POLICIES/Pp110_StatementonCreditsandDegrees.pdf.

New England Association of Schools and Colleges Commission on Institutions of Higher Education. 2009a. *Evaluation Manual*. Bedford, MA: New England Association of Schools and Colleges Commission on Institutions of Higher Education.

New England Association of Schools and Colleges Commission on Institutions of Higher Education. 2009b. *Guidelines for the Evaluation of Distance Education (On-Line Learning)*. Beford, MA: New England Association of Schools and Colleges Commission on Institutions of Higher Education. http://cihe.neasc.org/downloads/Pp90_Guidelines_for_the_Evaluation_of_Distance_Education.pdf.

North Central Association of Colleges and Schools—Higher Learning Commission. 2011a. *Commission Launches Criteria Revision Initiative: Welcomes Participation in Shaping the Outcome*. Chicago, IL: Higher Learning Commission. https://content.springcm.com/content/DownloadDocuments.ashx?Selection=Document%2Ce8ab5408-b845-e011-bf75-001cc448da6a%3B&accountId=5968.

North Central Association of Colleges and Schools—Higher Learning Commission. 2011b. *Higher Learning Commission Statement to the U.S. Senate Committee on Health, Education, Labor, and Pensions*. Chicago, IL: Higher Learning Commission of the North Central Association. https://content.springcm.com/content/DownloadDocuments.ashx?Selection=Document%2C9dab2893-b15f-e011-bf75-001cc448da6a%3B&accountId=5968.

North Central Association of Colleges and Schools—The Higher Learning Commission. n.d. *Best Practices for Electronically Offered Degree and Certificate Programs*. Chicago, IL: North Central Association of Colleges and Schools—The Higher Learning Commission. https://content.springcm.com/content/DownloadDocuments.ashx?Selection=Document%2C10708011%3B&accountId=5968.

Northwest Commission on Colleges and Universities. 2003. *Accreditation Handbook*, 2003 Edition. Redmond, WA: Northwest Commission on Colleges and Universities.

Northwest Commission on Colleges and Universities. 2010. *Glossary*. http://www.nwccu.org/Glossary%20and%20FAQs/Glossary/Glossary.htm.

Ochoa, E.M. 2011. *Dear Colleague Letter*. (GEN-11-06). Washington, DC: U.S. Department of Education. http://ifap.ed.gov/dpcletters/attachments/GEN1106.pdf.

Parsad, B., L. Lewis, and P. Tice. 2008. *Distance Education at Degree-granting Postsecondary Institutions: 2006–07*. Washington, DC: National Center for Education Statistics, Institute of Education Sciences.

Pittman, V. 1991. "Academic Credibility and the 'Image Problem': The Quality Issue in Collegiate Independent Study". In *The Foundations of American Distance Education: A Century of Collegiate Correspondence Study*, eds. B.L. Watkins and S.J. Wright. Dubuque, IA: Kendall/Hunt Publishing Company, 109-134.

Rose, R. 2002. "Policy Analysis as an Academic Vocation". In *Policy Evaluation: Beyond the Cutting Edge*, ed. S. Nagel. New York, NY: Nova Science Publishers, Inc., 9-23.

Scott, W.A. 2009a. *Alert Memorandum*. (ED-OIG/L13J0006). Washington, DC: Department of Education. http://www.ed.gov/about/offices/list/oig/auditreports/AlertMemorandums/l13j0006.pdf.

Scott, W.A. 2009b. *Review of the Middle States Commission on Higher Education's Standards for Program Length* (ED-OIG/I13J0005). Washington, DC: Department of Education. www.ed.gov/about/offices/list/oig/aireports/i13j0005.pdf

Scott, W.A. 2009c. *U.S. Department of Education's Inspector General Credit Hour 2009*. Washington, DC: Office of Inspector General. http://www2.ed.gov/about/offices/list/oig/aireports/i13j0004.pdf.

Shale, D. 2002. "The Hybridisation of Higher Education in Canada". *International Review of Open and Distance Learning* 2 (2): 1-11.

Shaw, R. 1993. "A Backward Glance: To a Time Before there was Accreditation". *North Central Association Quarterly* 68 (2): 323-335.

Shedd, J.M. 2003a. "The History of the Student Credit Hour". *New Directions for Higher Education* (122): 5-12.

Shedd, J.M. 2003b. "Policies and Practices in Enforcing the Credit Hour". *New Directions for Higher Education* 122(Summer): 13-30.

Smith, N. 2002. "Policy Evaluation and Analysis: A Response". In *Policy Evaluation: Beyond the Cutting Edge*, ed. S. Nagel. New York, NY: Nova Science Publishers, Inc., 39-41.

Snyder, T.D., S.A. Dillow, and C.M. Hoffman. 2008. Digest of Education Statistics 2007. Washington, DC: National Center for Education Statistices, Institute of Education Sciences.

Southern Association of Colleges and Schools Commission on Colleges. 2009. *Principles of Accreditation: Foundations for Quality Enhancement*, Fourth Edition. Decatur, GA: Southern Association of Colleges and Schools Commission on Colleges.

Morrill Act, 7 U.S.C. U.S. Congress §301 (1862.). http://www.ourdocuments.gov/doc.php?doc=33&page=transcript.

U.S. Department of Education. 2009. "Regional and National Institutional Accrediting Agencies." http://www.ed.gov/admins/finaid/accred/accreditation_pg7.html.

U.S. Department of Education. 2010a, 7 January. "An Overview of the U.S. Department of Education." http://www2.ed.gov/about/overview/focus/what_pg3.html#doesnot.

Program Integrity Issues. 2010. Program Integrity Issues: Final Rule, 75 Fed. Reg. U.S. Department of Education, 34 C.F.R. §600.2, §602.24, §603.24, and §668.8. pp. 66832-66975. http://www2.ed.gov/legislation/FedRegister/finrule/2010-4/102910a.html.

U.S. Network for Education Information. 2008a. "Recognition of Foreign Qualifications." http://www2.ed.gov/about/offices/list/ous/international/usnei/us/edlite-visitus-forrecog.html.

U.S. Network for Education Information. 2008b. *Structure of the U.S. Education System: Comparing U.S. and Other Credit Systems*. Washington, DC: U.S. Department of Education. http://www.ed.gov/international/usnei/us/comparecredit.doc.

U.S. Network for Education Information. 2008c. *Structure of the U.S. Education System: Credit Systems*. Washington, DC: U.S. Department of Education. http://www2.ed.gov/about/offices/list/ous/international/usnei/us/credits.doc.

U.S. Network for Education Information. 2008d. *Structure of the U.S. Education System: Experiential Credit Conversion*. Washington, DC: U.S. Department of Education. http://www.ed.gov/international/usnei/us/expcredit.doc.

VanKekerix, M., and J. Andrews. 1991. "Electronic media and independent study". In *The Foundations of American Distance Education: A Century of Collegiate Correspondence Study*, eds. B.L. Watkins and S.J. Wright. Dubuque, IA: Kendall/Hunt Publishing Company, 135-158.

Watkins, B.L. 1991. "A quite radical idea: The intervention and elaboration of collegiate correspondence study". In *The Foundations of American Distance Education: A Century of Collegiate Correspondence Study*, eds. B.L. Watkins and S.J. Wright. Dubuque, IA: Kendall/Hunt Publishing Company, 1-36.

Web-Based Education Commission. 2000. *The Power of the Internet for Learning: Moving from Promise to Practice*. Washington, DC: U. S. Department of Education.

Wellman, J.V., and T. Ehrlich. 2003a. "The Credit Hour: The Tie That Binds". *New Directions for Higher Education* 122(Summer): 119-122.

Wellman, J.V., and T. Ehrlich. 2003b. "Re-examining the Sacrosanct Credit Hour". *The Chronicle of Higher Education*, September 26. http://chronicle.com/article/Re-Examining-the-Sacrosanct/29120/?key=ST0gIFxtZyBINntmciEefnFfaHN7dUN9b3ZEMisabF5R.

Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities. 2010a. "Eligibility Review Panel Scoresheet." http://www.wascsenior.org/findit/files/forms/ERC_081118.Evaluation_Scoresheet.doc.

Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities. 2010b. *How to Become Accredited: Procedures Manual for Eligibility, Candidacy, and Initial Accreditation*. Alameda, CA: Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities. http://www.wascsenior.org/findit/files/forms/How_to_Become_Accredited__Jan_10.pdf.

Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities. 2010c. *Protocol for the Review of Distance Education Programs*. Alameda, CA: Western Association of Schools and Colleges Accrediting Commission for Senior Colleges and Universities. http://www.wascsenior.org/findit/files/forms/Protocol_for_Review_of_Dist_Ed_Progs_with_Wiche_Guidelines__Mar_2010_.pdf.

Wheelan, B.S. 2009. *Mr. W. Christian Vierling*. Decatur Georgia: Southern Association of Colleges and Schools Commission on Colleges. www2.ed.gov/about/offices/list/oig/aireports/i13j0004.doc

Wingard, R.G. 2004. "Classroom Teaching Changes in Web-enhanced Courses: A Multi-Institutional Study". *EDUCASE Quarterly* 27 (1): 26-35.

Wolanin, T.R. 2003. "The Student Credit Hour: An International Exploration". *New Directions for Higher Education* 122 (Summer): 99-117.