Innovation in Higher Education:

How public universities demonstrate innovative course delivery options

Stephen K. Callaway

The University of Toledo

2801 W. Bancroft, Toledo, OH

USA

Innovation in Higher Education:

How public universities demonstrate innovative course delivery options

Stephen K. Callaway

ABSTRACT

This study examines innovative ways that traditional public universities deliver online and hybrid web-enabled courses. The study finds which actual course features (lectures, readings, discussions, examinations, tutoring, and group work) are more likely found in pure online courses and which in hybrid courses. Results also reveal which of these course features students are likely to prefer to be online for purely online courses and for hybrid courses. Finally, results find which course features are associated with student satisfaction and student achievement. This in-depth study should help traditional public universities to develop more innovative (meaning creating new effective means to improve student satisfaction and achievement) online and partially online programs and courses, as they face competition from newer private online-only universities.

Keywords: Online education, web-enabled courses, student achievement, public universities

Introduction

Online education is increasing in popularity, and has been the topic of a substantial amount of research (Dykman & Davis, 2008a). Research by the Sloan Consortium indicates that the number of students in the United States taking at least one online course per year reached 3.2 million in 2005 (Allen & Seaman, 2003, 2004, 2005, 2006; Allen, Seaman, & Garrett, 2007; Sloan-C, 2007; see Dykman & Davis, 2008a). More students expect the convenience of online courses and programs. Traditional public universities, facing increasing competition from newer private online-only universities, must innovate their course offerings and programs. In response, many public universities are using technology to develop their own innovative curricula.

Therefore, besides online-only universities, many traditional public universities also now offer varying degrees of online education. Online education formats range from a portion of a course to offering entire degree programs (Holstrum & Lloyd-Jones, 1998). A small online segment may be integrated into a traditional course. For example, a professor may elect to use certain course management tools in order to facilitate out-of-class online discussion boards to complement in-class discussions. These tools can also be used to facilitate small group interaction through group chatting and file sharing, that is, to enhance classroom team projects. Moreover, traditional universities may offer entire courses or majors online (Bryant et al., 2005). As such, traditional universities may offer in the online environment entire programs, entire courses, or just specific features inside of a traditional course.

Many studies and reports, focusing predominantly on purely online and purely traditional courses, have shown mixed results regarding student satisfaction and achievement (refer to Hara & Kling, 1999; Hirschheim, 2005; Jackson & Helms, 2008; Klesius, Homan, & Thompson, 1997; Ponzurick, France, & Logar, 2000; Storck & Sproull, 1995, as examples). Therefore, it is important to research this entire range of online education formats offered at traditional universities. To do so, it is important to examine the role and effectiveness of offering specific course features or activities (e.g., lectures, readings and assignments, examinations, participation threats, etc.) This in-depth detail is required to truly understand the nature of this innovation to higher education.

Therefore, the current study will attempt to address these issues. This study will address the impact on student satisfaction and achievement of online-only courses and hybrid courses (those using web-enabled technologies) for traditional public universities. Specifically, this study looks at the course features that students would prefer to receive online, and what they actually do receive online. By looking more closely at specific course features, those that students prefer (perhaps because they are convenient), and those that students actually receive in various course formats, we should be better able to understand student satisfaction and student achievement. Indeed, the private online universities truly offer convenience for today's busy college students. Traditional public universities must compete with the private universities on this level of convenience, but without sacrificing the quality of the traditional four-year educational experience. Doing so may require substantial innovation to their curricula. Innovation refers to creating new effective means to improve student satisfaction and achievement.

The paper is organized as follows: First, a literature review of prior studies of online education is given, followed by development of hypotheses. Next, the methodology is described. Then, the hypotheses are tested in the results and analysis section. Finally, a discussion concludes the paper.

Literature Review

Online Education

According to Dykman & Davis (2008a), online education is increasing in popularity, and is the topic of much research. For example, the Sloan Consortium (by The Alfred P. Sloan Foundation) conducts research dealing with contemporary online education (Allen & Seaman, 2003, 2004, 2005, 2006; Allen, Seaman, & Garrett, 2007). Their research indicates that the number of students in the United States taking at least one online course per year is increasing by more than 20% in recent years, reaching more than 3.2 million in 2005 (Sloan-C, 2007). The organization defines an online course as one with at least 80% of the course delivered online without face-to-face meetings (Dykman & Davis, 2008a).

Many students at traditional universities may take entire programs online. Top institutions of higher education, such as the University of Texas, and other major traditional public universities, are all starting to offer degrees mostly or entirely online (Dykman & Davis,

2008a). Students are increasingly turning to online education to supplement, or even replace, traditional approaches to the classroom experience (Alavi & Leidner, 2001; Altbach, Gumport, & Johnstone, 2001; Hanna, Glowacki-Dudka, & Conceicao-Runlee, 2000; Palloff & Pratt, 2001). Even when enrolled in traditional programs, students may elect to take certain specific classes online.

The fundamental question, then, is whether a pure online course, a pure traditional face-to-face course, or a hybrid of the two, constitutes the most effective delivery format. When is the hybrid most effective? Because this is a fundamental question relating to the effectiveness of online education, this study addresses the issues of specific course features offered online versus in a traditional manner, for pure online classes as well as web-enabled classes. That is, while the convenience of these new online-only private universities may appeal to many students, just how traditional public universities should compete with these new universities is a critical question for the administrators.

Specific Course Features

In order to assess which classroom functions and activities are best offered traditionally and which online, important specific features were selected largely from Dykman & Davis (2008c). Their study was thorough, but was theoretical. While arguments can be made both for and against online classes, according to Farrington & Bronack (2001), too few are backed by empirical research. There may be some anecdotal accounts of successful online courses. Also, there are reports positing plenty of theories as to why certain approaches are most effective. While these insights are valuable, they do not offer the kind of understanding needed to make truly informed decisions about the value of online education (Farrington & Bronack, 2001; see Dykman & Davis, 2008c). Therefore, this study will test these features empirically.

Based on a thorough review of prior literature on such possible functions and activities, six specific features were selected for measurement in this study. The six general features of a classroom experience include lectures / presentation of new material, assigned readings and material, class discussions / participation, examinations, individualized tutoring, and working in teams. Many of the descriptions on these features came from Dykman & Davis (2008c); others also came from Bryant et al. (2005), Dereshiwsky (2001), Hirschheim (2005), Levin (1999), and Littleton, Phil, & Whitelock (2004). A discussion of each feature follows.

As posed in Dykman & Davis (2008c), the first two features of courses relate to students being exposed to new material; specifically the lecture on new material (usually recorded by the professor), and the assigned readings and other subject related material (e.g., books, articles). For example, a new module or unit usually begins with a "lecture" which summarizes the critical issues to be found in the readings for a given unit (Dykman & Davis, 2008c; Levin, 1999). The assigned readings and other material should also be reviewed by students. This new material may comprise chapters in a textbook, information from websites, supplemental readings, as well as additional lectures or video clips. These formats (lectures or readings) may be offered in audio form or text form (Dykman & Davis, 2008c). Indeed many of the new private online-only universities emphasize the convenience of their course offerings utilizing these features.

The third feature is class discussions and participation. According to Dykman & Davis (2008c), professors should prepare unit discussion questions related to the new material (lectures and assigned readings), which students should consider and post the answer in the online course's discussion board thread. These answers could be critical thinking essays that integrate various issues from the readings. This feature is an integral part of an online course and is as close to the traditional classroom setting as possible. This feature is where much of the actual learning occurs, and offers substantial opportunity for professor-student feedback and interaction (Dykman & Davis, 2008c).

A fourth feature for courses relates to testing the students' comprehension of the material – the examination. Exams can easily be created and taken entirely online, and may comprise multiple choice, short answer, or even essay question formats. However, there is a problem with this feature in online education. One does not really know the identity of the person doing the work in an online course, including taking the test (Dykman & Davis, 2008c). Therefore many professors hesitate to utilize this feature in an online environment. According to Dereshiwsky (2001), some traditional methods of assessment such as in-class timed examinations are not feasible in the online environment. Therefore, many professors and program administrators require students taking online courses to attend face-to-face examinations.

The fifth feature for courses is individualized tutorials. Students often need tutoring, or extra help, beyond the basic structure of courses. This tutoring can be one-on-one, and may be offered online or face-to-face. According to Littleton, Phil, & Whitelock (2004), this "individualized tutorial model" is what really helps students to learn in the electronic classroom. In fact, a skilled online professor will utilize the online course to create an organized framework for multiple individual tutorials involving the teacher and each student in the class. Students can even tutor other students. This individual attention is integral to online education (Dykman & Davis, 2008c; Littleton, Phil, & Whitelock (2004). This feature may be difficult and expensive to establish, and while valuable, may not be convenient for the student either; however traditional universities probably should emphasize this feature regardless.

Finally, the sixth feature for coursework relates to group work; that is, working in teams to complete a particular major project for the course. Group work can and probably should be done for online courses as well as traditional courses, however according to Hirschheim (2005), students in online courses often express surprise that they had to do group work given that they were enrolled in an online class. That is, offering more and more online programs and courses may lead many students to focus predominantly on individual effort. Professors must question whether they should let group work disappear as many online course students may expect (Hirschheim, 2005). That is, while this feature too is not particularly convenient, and may not necessarily be popular among some online students; its value should be appreciated.

Ultimately, while students taking online courses will actually receive more online course features, it is not necessarily the case that they will receive each of these features equally. Some features may be more common than others. Some course features may be common to all online courses, still others just some online courses. In particular some programs have elements that are offered online and elements that are offered traditionally. Certain online course features may be fully utilized by nearly all professors, such as lectures, readings, and discussions, while other

features are selected by relatively fewer professors. That is, students in online courses may actually receive lectures, assigned readings, and discussion threads, as those are the most typical online features, as they are the easiest to coordinate in courses. Lectures, readings and discussions will be somewhat less common. In sum,

Hypothesis 1: More online courses will be positively associated with more online actual course features. However, lectures, readings, and discussions will be more strongly associated with online courses than will examinations, tutoring, and group work.

However, much research questions the suitability of certain courses being offered online (Hara & Kling, 1999). Some courses are best served if taught in the traditional, face-to-face manner, while others can be effectively delivered online. Even within some classes taught in the traditional manner, some particular features (specific classroom activities, administrative functions, etc.) can be offered online, using a web-assisted component. As such, instructors may be able to effectively create the 'best of both worlds', integrating online with traditional teaching. For example, Chamberlin (2001) did suggest that such a hybrid course (some features traditional, others online) can take advantage of the strengths both of face-to-face and online teaching. If so, such an approach may be truly innovative.

Because many students have different preferences for which course features should be online, and because some of these features may be rather more easily integrated into any kind of class than others, designing a course which is a mix of the online and the traditional for some of those features may be fruitful. As such, the use of "blended learning" (mixing traditional and online) is expanding, and debate continues on what the impact on student achievement and satisfaction is (Jackson & Helms, 2008; Noble, 2003).

Chamberlin (2001) did suggest that such a blended course can take advantage of the strengths both of traditional and online teaching. Moreover, other prior research argued that this hybrid format offers a way to minimize the weaknesses of online education (Bersin, 2004; Mackay & Stockport, 2006; Noble, 2003). On the other hand, according to Jackson & Helms (2008), such a format possesses an equal number of strengths and weaknesses, which suggests that there are trade-offs with this approach. Further, according to Jackson & Helms (2008), some researchers argue that the hybrid delivery corresponds to the 'stuck-in-the-middle' strategy, an organizational strategy that is neither low-cost nor differentiated, which Porter (1990) criticized as being ineffective (i.e., not truly innovative). Clearly further studies are warranted.

Overall, then, students who take a greater number of web-enabled courses (traditional classes that utilize some of the course features listed above to supplement the in-class portion) are expected to actually receive a greater number of online features. In particular they may receive lectures, readings and discussion, through online threads to supplement in-class participation. However, students probably would prefer to take exams online, though professors may be unlikely to offer such a feature because of the aforementioned anonymity.

Hypothesis 2: More hybrid courses will be positively associated with some actual online course features. Specifically, hybrid courses will be positively associated with lectures, readings, and discussions; while no relationship is expected for examinations, tutoring, and group work.

Of course, it is expected that students who select a greater number of online courses prefer to receive these same features in an online manner, assuming that they are actually able to choose whether to take a course online or traditionally. However, some students may choose certain classes based upon other administrative issues (availability, convenience, program requirements, recommendation of advisors, etc.), which says nothing about what specific features they would like to see online more often, and which they would like to see more often traditionally. Also, some students who take traditional classes may desire to see certain features online, but it is the professors' discretion whether to offer such features in the course. Finally, some students enrolled in online courses may actually prefer to see some specific features offered traditionally, as opposed to other features.

Thus, students selecting online courses will prefer some specific course features to be online, more so than some other course features. Students will prefer the conveniences of online courses particularly for those features that are well-suited to individual effort, and less so for features that rely on group effort or where substantial communication makes speaking more convenient than typing. That is, preferred course features relate to student convenience. Students likely prefer to receive lectures, assigned readings, and examinations, because those items reflect individual effort rather than group effort.

Hypothesis 3: More online courses will be positively associated with online preferred course features. However, lectures, readings, and examinations will be more strongly associated with online courses than will discussions, tutoring, and group work.

This relationship (a preference for individual effort and less required team communication) likely is even more apparent for hybrid, web-enabled courses. For example, students may see online lectures and readings as a partial substitute for actual in-class attendance, or a way to make up for absences. Also, as mentioned above, students probably would prefer to take exams online, though professors may be unlikely to offer such a feature because of the aforementioned anonymity.

Hypothesis 4: More hybrid courses will be positively associated with some online preferred course features. Specifically, hybrid courses will be positively associated with lectures, readings, and examinations; while no relationship is expected for discussions, tutoring, and group work.

Impact on Satisfaction

Once we examine what particular features students in online and hybrid classes prefer to receive and actually do receive, it is important to understand that impact on student satisfaction and achievement. Some students signing up for online coursework may be motivated by its convenience, however the quality of course instruction is still paramount (Hirschheim, 2005). Some actual course features will relate to satisfaction with convenience while others relate more to satisfaction with quality.

For example, Muirhead (2002) and Kearsley (1996) both indicated that flexibility in particular is an important determinant of student satisfaction for online classes. Their research argues that students want to maintain some autonomy over when and how they complete assignments and participate in the online course (Bryant et al., 2005; Kearsley, 1996; Muirhead,

2002). As such, the course features lectures, readings and examinations (those associated with individual effort) likely will be associated with satisfaction with convenience. In this case, satisfaction with convenience entails satisfaction with the speed to degree (frequently online programs may be seen as a quicker way to obtain a degree), satisfaction with time convenience (completing the coursework whenever), and satisfaction with place convenience (completing the coursework wherever). Indeed many private online universities emphasize such attributes.

Moreover, Bryant et al. (2005), argues that quality classroom interaction (such as student-instructor or between students) is critical for successful online education (Fulford & Zhang 1993; Vrasidas & McIsaac 1999). Online class discussion and participation provide the basis for this virtual classroom interaction. Also, group work and tutoring are essential for quality learning in any educational program. Prior research points to a high correlation between classroom interaction and student satisfaction (Bryant et al., 2005; Roblyer & Wiencke, 2003). In this case, satisfaction with quality entails satisfaction with the quality of course and instructor, satisfaction with interaction with faculty, and satisfaction with peer (student) interaction. Indeed these attributes have typically been emphasized by traditional public universities. Thus,

Hypothesis 5: Certain actual course features will be positively associated with student satisfaction with quality while other actual course features will be positively associated with student satisfaction with convenience. Specifically, lectures, readings, and examinations will be associated with satisfaction with speed to degree, time convenience and place convenience; while discussions, tutoring, and group work will be associated with satisfaction with course and instructor, faculty interaction and peer interaction.

Impact on student achievement

Finally, it is important to ascertain the effect of each of the six course features on student achievement, when these features are offered via an online course or a hybrid web-enabled course. For example, one study showed that online students believed they received a lower quality of education, but in fact their grades indicated there was no difference (Hirschheim, 2005). In particular, those features that best serve to supplement traditional course instruction may be most effective in improving student achievement. Specifically, classes where students had higher levels of interaction with instructor and classmates reported greater motivation and higher levels of learning (Eom et al., 2006; Swan, 2001). As such, one could expect a greater amount of actual online class discussions, individualized tutoring, and group work to have the greatest effect on student achievement, because those features bring about the best interaction and opportunity for professor feedback, which is so essential for student achievement. Moreover those three features complement traditional course instruction rather than compete with it. Note that this is not arguing that online tutoring or discussions is superior to traditional tutoring or discussions. This is arguing that given a level of online courses or hybrid courses, greater usage of these three actual course features will be associated with greater achievement. Student achievement is represented by GPA. Therefore,

Hypothesis 6: For both online courses and hybrid courses, some actual online course features will be positively associated with GPA. Specifically, discussions, tutoring, and group work will be positively associated with GPA.

Methodology

The current study examined online course offerings versus traditional courses for traditional public four-year universities. Therefore, two large-sized public universities located in the Midwestern United States were targeted for this study. These universities offered a good mix of courses that were entirely online, entirely traditional, or a hybrid format (using web-enabled technology).

The study involved collecting primary data using a student questionnaire. The questionnaire was developed using previous theoretical studies and reports with anecdotal evidence. After selecting possible constructs and operationalizations for the questionnaire, interviews with administration officials at one of those universities (e.g., student admissions office) were conducted to further develop the questionnaire. This step was performed to help ensure that this research did not repeat what has already been established from other studies, and to help direct the research toward what are critical issues for public university administration. The first question asked what portion of classes taken were taught in a face-to-face physical classroom setting – from 1 'none' through 5 'all the classes'. The next question asked what portion of classes taken were online–from 1 'none' through 5 'all the classes'.

Then, six specific course features were selected based on a thorough review of prior literature, largely from Dykman & Davis (2008c), as stated above. The six features are lectures, readings, discussions, examinations, tutoring, and group work. Besides Dykman & Davis (2008c), information on these features also came from Bryant et al. (2005), Dereshiwsky (2001), Hirschheim (2005), Levin (19999), and Littleton, Phil, & Whitelock (2004). For each course feature, students were asked to assess how they current receive them, from 1 'entirely in person' through 5 'entirely online'. Then they were asked to assess how they would prefer to receive each of these features, from 1 'entirely in person' through 5 'entirely online'.

Next, satisfaction factors were selected, based on Dykman & Davis (2008a, 2008b, 2008c) and Herschheim (2005), related to both convenience and quality. Factors related to convenience include time convenience and place convenience as well as speed to degree completion. Quality factors include satisfaction with course and instructor as well as classroom interaction (instructor-student and between students). Finally, to represent student achievement, students were asked to report their GPA in the survey. GPA is supported by some empirical research as an objective measure of student achievement (e.g., Kan & Cheung, 2007).

Results and Analysis

The above questionnaire was posted online, and emails were sent to students at the two universities. 363 responses were received, with 357 usable responses. So the hypotheses were tested using SPSS. The first hypothesis argued that greater online courses would be positively associated with greater online actual course features; and that lectures, readings, and discussions would be more strongly associated with online courses than examinations, tutoring, and group work. This was partly supported; indeed online courses were associated with online features. However, readings was somewhat weaker than expected, while examinations and group work were somewhat stronger than expected (looking at adjusted R-squared; that is, how much variance was explained). Hypothesis 2 argued that greater hybrid courses would be positively

associated with lectures, readings, and discussions; while no relationship was expected for examinations, tutoring, and group work. However, results indicated that actually none of the course features were associated with hybrid courses. Refer to Table 1 which shows the results for Hypotheses 1 and 2.

Table 1. Results of Linear Regression Analysis for Hypotheses 1 and 2

	Dependent Variables - Actual Online Features					
	Lectures	**Readings**	**Discussions**	**Exams**	**Tutoring**	**GroupWork**
(Full Online)$^\Delta$	.886 (.064)	.560 (.064)	.872 (.061)	.868 (.064)	.750 (.115)	.829 (.074)
Constant	0.424	1.473	0.752	0.692	1.976	0.818
R^2	0.359	0.187	0.328	0.357	0.112	0.273
Adj. R^2	0.357	0.185	0.326	0.356	0.109	0.271
F-test	189.078***	77.721***	163.954***	186.913***	42.47***	126.307***
	Dependent Variables - Actual Online Features					
	Lectures	**Readings**	**Discussions**	**Exams**	**Tutoring**	**GroupWork**
(Hybrid Online)$^\Delta$	-.030 (.066)	.054 (.058)	-.005 (.061)	.011 (.066)	-.164 (.101)	-.120 (.071)
Constant	2.137	2.380	2.322	2.302	3.748	2.635
R^2	0.001	0.003	0.002	0.000	0.008	0.008
Adj. R^2	-0.002	0.000	-0.001	-0.003	0.005	0.005
F-test	0.203	0.882	0.663	0.029	2.599	2.838

$^\Delta$ Unstandardized coefficient (Std. Error)

*** Significant at 0.001 level

The third hypothesis stated that greater online courses would be positively associated with online preferred course features, and that lectures, readings, and examinations would be more strongly associated with online courses than would discussions, tutoring, and group work. This was partly supported, except that readings was weaker than expected and discussions was stronger than expected. Hypothesis 4 stated that hybrid courses would be associated with lectures, readings, and examinations; with no relationship expected for discussions, tutoring, and group work. However, results indicated that actually none of the preferred course features were associated with hybrid courses. Refer to Table 2 which shows the results for Hypotheses 3 and 4.

Hypothesis 5 argued that lectures, readings, and examinations would be associated with satisfaction with speed to degree, time convenience and place convenience; while discussions, tutoring, and group work would be associated with satisfaction with course and instructor, faculty interaction and peer interaction. This hypothesis was partially supported (with some of the items). Lectures was indeed associated with satisfaction with speed and with place convenience, but was also unexpectedly associated with satisfaction with course / instructor as well. Likewise, readings was unexpectedly associated with satisfaction with course and instructor. Examinations were also associated with satisfaction with speed, time and place convenience, as expected. Refer to Table 3 for a summary of these results.

Finally, Hypothesis 6 argued that for both online courses and hybrid courses, discussions, tutoring, and group work would be positively associated with GPA. After controlling for pure online courses, results indicated that tutoring was associated with GPA. However, lectures was also unexpectedly significant. Tutoring was also associated with GPA when controlling for hybrid courses, as expected. So Hypothesis 6 was partly supported. Refer to Table 4.

Table 2: Results of Linear Regression Analysis for Hypotheses 3 and 4

	Dependent Variables - Preferred Online Features					
	Lectures	**Readings**	**Discussions**	**Exams**	**Tutoring**	**TeamWork**
(Full Online)$^\Delta$	.802 (.066)	.530 (.074)	.736 (.069)	.677 (.078)	.676 (.102)	.531 (.075)
Constant	0.680	1.723	0.851	1.637	1.265	1.302
R^2	0.308	0.134	0.256	0.184	0.118	0.132
Adj. R^2	0.306	0.131	0.254	0.182	0.115	0.129
F-test	147.008***	51.079***	113.898***	74.334***	43.982***	50.457***
	Dependent Variables - Preferred Online Features					
	Lectures	**Readings**	**Discussions**	**Exams**	**Tutoring**	**TeamWork**
Ind. Var.						
(Hybrid Online)$^\Delta$	-.050 (.063)	-.019 (.064)	-.039 (.064)	.041 (.070)	-.091 (.087)	-.023 (.064)
Constant	2.268	2.732	2.308	2.800	2.727	2.317
R^2	0.002	0.000	0.001	0.001	0.003	0.000
Adj. R^2	-0.001	-0.003	-0.002	-0.002	0.000	-0.003
F-test	0.621	0.92	0.377	0.34	1.094	0.127

$^\Delta$ Unstandardized coefficient (Std. Error)

*** Significant at 0.001 level

Table 3. Results of Linear Regression Analysis for Hypothesis 5

| | Dependent Variables - Measures of Satisfaction. Satisfaction with… | | | | | |
	Course & Instructor	Faculty Interaction	Peer Interaction	Speed to Degree	Time Convenience	Place Convenience
Lectures						
Adj. R^2	0.013	0.004	0.005	0.019	0.000	0.021
F-test	5.641*	2.337	2.868	7.736**	0.995	8.59**
Readings						
Adj. R^2	0.012	-0.001	-0.003	0.004	-0.001	0.000
F-test	5.320*	0.608	0.008	2.403	0.541	1.173
Discussions						
Adj. R^2	-0.002	-0.003	-0.002	0.002	-0.001	0.003
F-test	0.153	0.032	0.344	1.752	0.671	2.184
Exams						
Adj. R^2	0.002	-0.002	-0.002	0.015	0.019	0.019
F-test	1.796	0.286	0.203	6.452*	7.767**	7.719**
Tutoring						
Adj. R^2	-0.003	-0.003	0.005	0.000	-0.003	-0.001
F-test	0.028	0.097	2.923	1.058	0.013	0.721
GroupWork						
Adj. R^2	-0.003	-0.002	-0.002	0.002	-0.003	-0.003
F-test	0.003	0.125	0.173	1.552	0.003	0.072

** Significant at 0.01 level

* Significant at 0.05 level

Table 4. Results of Linear Regression Analysis for Hypothesis 6

Independent Variables - Actual Online Course Features, controlling for full online courses

Dep. Var - GPA)	Lectures	Readings	Discussions	Exams	Tutoring	Groups
Coeff.	.095 (.039)	.046 (.033)	.073 (.036)	.083 (.037)	.022 (.031)	.061 (.035)
Constant	3.361	3.303	3.356	3.356	3.234	3.341
R^2	0.019	0.018	0.015	0.017	0.064	0.015
Adj. R2	0.013	0.012	0.009	0.011	0.058	0.009
F-test	3.118*	3.003	2.475	2.771	11.073***	2.407

Δ Unstandardized coefficient (Std. Error)

*** Significant at 0.001 level

** Significant at 0.01 level

* Significant at 0.05 level

Independent Variables - Actual Online Course Features, controlling for hybrid online courses

Dep. Var - GPA)	Lectures	Readings	Discussions	Exams	Tutoring	Groups
Coeff.	.003 (.025)	.001 (.025)	.002 (.025)	.004 (.025)	.013 (.024)	.006 (.025)
Constant	3.447	3.354	3.421	3.420	3.222	3.395
R^2	0.000	0.010	0.002	0.001	0.067	0.004
Adj. R^2	-0.006	0.004	-0.004	-0.005	0.061	-0.002
F-test	0.031	1.590	0.300	0.232	11.42***	0.719

Δ Unstandardized coefficient (Std. Error)

*** Significant at 0.001 level

Conclusion

This study has contributed to studies of online education by examining not only purely online courses, but hybrid web-enabled courses as well, for public universities. The study has examined what specific course features students prefer to receive, what they actually receive, and the impact on student satisfaction and achievement. Results showed that students selecting online courses did indeed prefer online features, slightly less so for online tutoring and online group work. However, students taking web-enabled courses did not show any more likelihood to prefer or to actually receive any specific course features. There would appear to be no consistency among either the students or the faculty as to what is the most effective and innovative way to design hybrid courses; a revelation which is unfortunate. Finally, online tutoring was found to be positively associated with GPA. Implications are that while web-enabled courses offer substantial opportunities for greater satisfaction and achievement, those specific course features that might work best seem to not yet have been identified or implemented. Students have scattered preferences and professors utilize these features inconsistently. One item that has been shown to lead to higher GPA, online tutoring, actually was slightly less common. Therefore, finding out what specific course features are most innovative (finding new effective means to generate student satisfaction and achievement) should be the aim of continued research.

This study only targeted two similar traditional public schools. Indeed public universities vary greatly as to their approach toward online courses and programs. As such, the small number of schools selected, with little variety in the type of online course and program offerings, could have affected the results of this study. Therefore, future studies should examine not only a greater number and variety of colleges and universities, but colleges with limited online education offerings. Most importantly, the concept of course features needs to be further developed, with more features included, specific features most used in certain programs or classes tabulated, and how those features are utilized (not just what the features are) elaborated. Ultimately, though, this study has identified the need for researchers to better explain which specific web-enabled technologies (hybrid courses) impact student satisfaction and achievement the best, and in what context. It is important for traditional public universities, while competing with the conveniences of the newer private online universities, to not lose sight of their own traditional strengths and mission.

About the Author

Stephen K. Callaway is an Assistant Professor in the College of Business and Innovation at the University of Toledo, where he teaches courses in entrepreneurship and strategic management. His research interest is technology management, in particular e-commerce, online education and alternative energy. He has 17 publications or acceptances including journals such as the *Information Resources Management Journal* and *The Journal of High Technology Management Research*. Email: Stephen.Callaway@utoledo.edu.

References

Alavi, M., & D. E. Leidner. 2001. "Research commentary: Technology-mediated learning--a call for greater depth and breadth of research." *Information Systems Research*, 12(1): 1-10.

Allen, I. E., & J. Seaman. 2003. *Sizing the opportunity: The quality and extent of online education in the United States*. Needham, Massachusetts: The Sloan Consortium.

Allen, I. E., & J. Seaman. 2004. *Entering the mainstream: The quality and extent of online education in the United States*. Needham, Massachusetts: The Sloan Consortium.

Allen, I. E., & J. Seaman. 2005. *Growing by degrees: Online education in the United States*. Needham, Massachusetts: The Sloan Consortium.

Allen, I. E., & J. Seaman. 2006. *Making the grade: Online education in the United States*. Needham, Massachusetts: The Sloan Consortium.

Allen, I. E., J. Seaman, & R. Garrett. 2007. *Blending in: The extent and promise of blended education in the United States*. Needham, Massachusetts: The Sloan Consortium.

Altbach, P.G., P. J. Gumport, & D. B. Johnstone. 2001. *In defense of American higher education*. Baltimore, Maryland: Johns Hopkins University Press.

Bersin, J. 2004. *The blended learning book: Best practices, proven methodologies, and lessons learned*. San Francisco, California: Pfeiffer.

Bryant, S., J. Kahle, and B. Schafer. 2005. "Distance education: A review of the contemporary literature." *Issues in Accounting Education*, 20 (3): 255–72.

Chamberlin, W. S. 2001. "Face to face vs. cyberspace: Finding the middle ground." *Syllabus*, 15: 11.

Dereshiwsky, M. 2001. ''A'' is for assessment: Identifying online assessment practices and perceptions." *Journal of United States Distance Learning Association*, 15(1): 16–26.

Dykman, C. & C. Davis. 2008a. "Online education forum: Part one -The shift toward online education." *Journal of Information Systems Education*, 19(1): 11-16.

Dykman, C. & C. Davis. 2008b. "Online education forum: Part two -Teaching online versus teaching conventionally." *Journal of Information Systems Education*, 19(2): 157-64.

Dykman, C. & C. Davis. 2008c. "Online education forum: Part three - A quality online educational experience." *Journal of Information Systems Education*, 19(2): 281-89.

Eom, S. B., H. G. Wen, & N. Ashill. 2006. "The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation." *Decision Sciences Journal of Innovative Education*, 4 (2): 215-35.

Farrington, G., & S. Bronack. 2001. "Sink or Swim?" *The Journal Online*, 05/01/01. Retrieved July 20, 2012, from http://thejournal.com

Fulford, C., & S. Zhang. 1993. "Perceptions of interaction: The critical predictor in distance education." *The American Journal of Distance Education,* 7 (3): 8–21.

Hanna, D. E., M. Glowacki-Dudka, & S. Conceicao-Runlee. 2000. *147 practical tips for teaching online groups: Essentials of web-based education*. Madison, Wisconsin: Atwood Publishing.

Hara, N., & R. Kling. 1999. "Students' frustrations with a Web-based distance education course: A taboo topic in the discourse." *First Monday*, 4: 12.

Hiltz, S. R. 1997. "Impacts of college-level courses via asynchronous learning networks: Some preliminary results." *Journal of Asynchronous Learning Networks*, 1 (2).

Hirschheim, R. 2005. "The Internet-based education bandwagon: Look before you leap." *Communications of the ACM*, 48 (7): 97-101.

Holstrum, G., & J. Lloyd-Jones. 1998. *The Internet and distance learning in accounting education: A hypertext-linked exploration of the topic*. Working paper, International Federation of Accountants, New York.

Hornby, P., & M. Anderson. 1995. "Putting the student in the driver's seat: A learner centered, self-paced, computer managed, introductory course." *Journal of Educational Technology Systems*, 24 (2): 173-79.

Jackson, M., & M. Helms. 2008. "Student perceptions of hybrid courses: Measuring and interpreting quality." *Journal of Education for Business*, 84 (1): 7-12.

Kan, A., & L. Cheung. 2007. "Relative effects of distance versus traditional course delivery on student performance in Hong Kong." *International Journal of Management*, 24 (4): 763-73.

Kearsley, G. 1996. "Structural issues in distance education." *Journal of Education for Business*, 71 (4): 191.

Klesius, J. P., S. Homan, & T. Thompson. 1997. "Distance education compared to traditional education: The students' view." *International Journal of Instructional Media*, 24: 207–22.

Levin, J. 1999. "Multiplicity in learning and teaching: A framework for developing innovative online education." *Journal of Research on Computing in Education*, 32(2): 256-70.

Littleton, K., D. Phil, & D. Whitelock. 2004. "Guiding the creation of knowledge and understanding in a virtual learning environment." *CyberPsychology and Behavior*, 7(2): 173-81.

Mackay, S. T., & G. J. Stockport. 2006. "Blended learning: Classroom and e-learning." *Business Review*, 5(1): 82–8.

Pear, J., & M. Novak. 1996. "Computer-aided personalized system of instruction: A program evaluation." *Computers in Teaching*, 25(2): 119-23.

Porter, M. E. 1990. "New global strategies for competitive advantage." *Planning Review*, 18(3): 4–14.

Muirhead, B. 2002. "Promoting online interaction in today's colleges and universities." *USDLA Journal*, 16 (7): 43–7.

Noble, D. F. 2003. *Digital diploma mills: The automation of higher education*. New York, NY: Monthly Review Press.

Nunnally, J. D. 1978. *Psychometric theory*, (2nd ed.) New York, New York: McGraw-Hill.

Palloff, R., & K. Pratt. 2001. *Lessons from the cyberspace classroom: The realities of online teaching*. San Francisco, CA: Jossey-Bass.

Ponzurick, T., K. France, & C. Logar. 2000. "Delivering graduate marketing education: An analysis of face-to-face versus distance education." *Journal of Marketing Education*, 22: 180–87.

Roblyer, M., & W. Wiencke. 2003. "Design and use of a rubric to assess and encourage interactive qualities in distance courses." *The American Journal of Distance Education*, 17 (2): 77–98.

Sloan-C. Sloan Consortium for Online Education. 2007. "Online Nation: Five Years of Growth in Online Learning." Retrieved July 20, 2012, from http://www.sloan-c.org/

Sloane, A. 1997. "Learning with the Web: Experience of using the World Wide Web in a learning environment." *Computers and Education*, 28 (4): 207-12.

Smith, G., D. Ferguson, & M. Caris. 2001. "Teaching college courses online vs. face-to-face." *The Journal Online*, 04/01/01. Retrieved July 20, 2012, from http://thejournal.com

Spooner, F., L. Jordon, B. Algozzine, & M. Spooner. 1999. "Student ratings of instruction in distance learning and on-campus learning." *The Journal of Educational Research*, 92 (3): 132-40.

Storck, J., & L. Sproull. 1995. "Though a glass darkly, what do people learn in videoconferences." *Human Communication Research*, 22 (2): 197-219.

Swan, K. 2001. "Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses." *Distance Education*, 22(2): 306–31.

Vrasidas, C., & M. McIsaac. 1999. "Factors influencing interaction in an online course." *The American Journal of Distance Education*, 13 (3): 22–36.