Teaching Hybrid Undergraduate Classes with Online Students

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Abstract—This paper examines instructional strategies utilized to teach a class that is both hybrid and online at the same time. It addresses student’s perceptions of course technologies when used across two delivery modalities, namely hybrid and online. The courses were taught Fall semester 2009, with 30 students utilizing asynchronous and synchronous technologies, namely Blackboard and Wimba. As these courses were being taught, I knew I would be teaching the same class entirely online Spring semester 2010. Different instructional strategies were explored during these courses to accommodate both hybrid and online students. The students were given a modified survey instrument originally constructed from Davis (1989), Technology Acceptance Model. The survey examined perceived usefulness, ease of use and behavioral intention and how they may be influenced by gender, age and other variables across hybrid, and online course delivery strategies. The survey provided an important understanding of student attitudes toward courses enhanced with these technologies and how that information may encourage future professors in the use of course technologies. The problem addressed in this study is the students’ perception of, attitudes toward use, and behavioral intention to use course technologies specifically Blackboard and Wimba across the two teaching methods (hybrid and online). Understanding the use of course technologies may better understand students’ perceptions, attitudes, and behaviors toward these technologies.

Index Terms—Instructional strategies, hybrid courses, online courses, student attitudes.

I. INTRODUCTION

Technology has tremendous potential for positive impact on retention and graduation rates (Sachs, 2009). It can bridge the instructional gap that faculty and students face. Many faculty members found that technology has helped them better connect with their students (Carlson, 2004). The concern is not whether technology is used, rather, does an instructor ensure quality and achieve learning goals when teaching via a different medium (Hutchins, 2003).

The technologies described in this paper have been implemented in most of my classes dealing with both undergraduate and graduate students. I believe the use of these technologies have made me a better educator and improved the learning experience of my students. This was a hybrid class in Logic. Current literature suggests that the hybrid model supports student learning more effectively than any other format and that the hybrid format can be achieved for most courses (Reasons, Valadares, Slavkin, 2005).

This paper addresses the Mathematics course entitled “Logic” which was taught Fall semester 2009 as a hybrid course with 3 students out of the 30 undergraduate students being taught totally online. The online students were part of a program through Lansing Community College but enrolled at Lawrence Tech for the course. The software utilized for both the hybrid and totally online students involved Blackboard which is an asynchronous delivery mode and Wimba which is a synchronous format. An asynchronous learning environment is one in which students and instructors are engaged in “anytime-anyplace” learning. Students do not have to be in the same room with other students or their instructor, nor do they all have to be engaged in a learning activity at the same time (Waterhouse, 2005). The hybrid portion of the course was a combination of face-to-face instruction and synchronous online instruction utilizing Wimba. A synchronous learning environment is one in which students and instructors engage each other at the same time, but not necessarily at the same location. Traditional classroom-based learning is a common form of synchronous learning (Waterhouse, 2005).

Each week during the semester the hybrid students met face-to-face twice a week and virtually on Fridays using synchronous delivery (Wimba). During the face-to-face instruction, a wireless microphone was utilized to capture the lecture in a synchronous learning environment. Each week the online students had the option to attend the face-to-face classes synchronously on a virtual basis, or asynchronously by listening to the material at a different time. The Friday weekly synchronous online instruction session was attended by both the hybrid and online students each week.

The class was organized into weekly modules and the related materials, which included theory and practice. The theory component included readings, resource materials, recorded PowerPoint lectures, podcasts, and web links. The practice component included assignments and discussion forums. Even though the online students did not participate in face-to-face interaction, they had virtual interaction via online discussions and Wimba sessions. Participation in class discussion can be an indicator of student success in both face-to-face and online settings (Stacey & Rice, 2002). Assignments and discussion forums included individual and group work. When creating interactive assignments or activities, it is a good idea to involve a mixture of individual and group assignments or activities which involve different interactivity levels. Interactivity increases students’ interest improves cognitive processes, and develops group learning skills (Morgan & Kinross, 2002).
It does not matter whether learners are using asynchronous, synchronous, traditional, hybrid, or online. What is important is to create a comfortable learning environment for learners. Learners should feel that the instructor is approachable whether they are teaching face-to-face, hybrid, or online.

II. TECHNOLOGY ACCEPTANCE MODEL

This study examined students’ perceptions of attitudes toward use, and behavioral intention to use course technologies, specifically Blackboard and Wimba across the two teaching methods, using a modified Technology Acceptance Model Survey. The survey was administered through SurveyMonkey based on their gender, age, status (full/part-time) and hybrid/online experience.. Davis’ (1989) Technology Acceptance Model (TAM) provided the theoretical base for examining students’ perceptions and acceptance of computer-mediated communication tools, specifically Blackboard™’s Course Management System. While TAM was derived from the Theory of Reasoned Action (TRA), created by Fishbein and Azjen in 1975, each were found to satisfactorily predict intentions and usage, TAM provides a stronger basis for examining factors that contribute to student (user) acceptance of technology (Leong, 2003).

TAM measures the relationship of an individual’s belief, attitude, and behavioral intention to accept and potentially use a specific technology or feature of a technology. Davis set out to answer the question “What causes people to accept or reject information technology”. By building upon the Theory of Reasoned Action, Davis explored the prospect that beliefs influence attitudes that indicate intentions and generate behaviors relative to technology acceptance (Bush, 2006b). Therefore, the perception of the usefulness and ease of use relative to a specific technology or function shapes the attitude toward its use and behavioral intention to make use of the technology.

Perceived usefulness of a technology or function depends greatly upon the degree to which it will enhance performance (Davis, 1989). A positive perceived usefulness influences a positive attitude toward the use of the technology and therefore, is perceived as enhancing the performance of the individual.

Perceived ease of use of that technology indicates a belief that the technology is free of effort or easy to use on the part of the user (Davis, 1989; Lederer, Maupin, Sena, & Zhuang, 1998). If the technology being examined or introduced seems difficult to use then alternatives or existing systems that are easier to use will be considered over the newer technology. The relationship between perceived ease of use and attitude toward use hinges upon the users sense of efficacy and personal control regarding this ability to use the technology (Bush, 2006a). Therefore, the user will feel motivated to use the technology. Additionally the relationship between perceived ease of use and perceived usefulness indicates that technologies that are easier to use contribute to improved performance by the user (Davis, 1989; Rigopoulos, Psarras, & Askounis, 2008).

In addition to the above variables in the technology acceptance model, the study was expanded to include gender, age, status (full/part-time) and delivery method (traditional, hybrid, and online) to determine if these external variables influenced the variables of the technology acceptance model.

III. METHODS

The study used a survey constructed from Davis’s (1989) original Technology Acceptance Model survey, modified to include external variables. The survey allowed the researchers to examine perceived usefulness, ease of use and behavioral intention and how they may be influenced by gender, age, status (full/part-time) and delivery method (traditional, hybrid, or online).

Makeup of the participants in the class and survey were as follows:

- majority of the participants were female (53.2%),
- majority of the participants were architecture majors,
- 80.9% of the participants were between 18 to 24 years of age,
- freshman represented 70.2% of the students,
- 91.3% of the students were full-time,
- 70.2% were not employed,
- 44.7% lived on campus, and
- 70.3% had taken at least on hybrid course before.

IV. RESULTS

The quantitative study investigated teaching methods such as traditional, hybrid, and online learning modalities as they were perceived by the study participants. Hypotheses state expected relationships between variables or a specific statement of prediction. Data was collected during the last week of the Fall 2009 semester from my Logic class, with 30 students utilizing Blackboard and Wimba.

A. Finding: The technologies are easy to use

From the traditional portion of the hybrid class the survey results were as follows:

- majority of students found the technologies easy to use, (76.4%),
- 67.4% agree,
- 9.3% strongly agreed,
- 7% strongly disagreed, and
- 16.3% were neutral.

From the online portion of the hybrid class the survey results were as follows:

- majority of students found the technologies easy to use (69.3%),
- 59% agreed,
- 10.3% strongly agreed,
- 2.6% strongly disagreed, and
- 2.6% disagreed, and
...25.6% were neutral.

From the online course the survey results were as follows:
- majority of students found the technologies easy to use, (62.5%),
- 50% agreed, 
- 12.5% strongly agreed, 
- 4.2% strongly disagreed, 
- 4.2% disagreed, and 
- 29.2% were neutral.

B. Finding: The technologies are useful in course work

From the traditional portion of the hybrid class the survey results were as follows:
- majority of students found the technologies useful in their course work, (76.2%),
- 64.3% agreed, 
- 11.9% strongly agreed, 
- 9.5% strongly disagreed, and 
- 14.3% were neutral.

From the online portion of the hybrid class the survey results were as follows:
- majority of students found the technologies useful in their course work, (59%),
- 51.3% agreed, 
- 7.7% strongly agreed, 
- 7.7% strongly disagreed, 
- 5.1% disagreed, and 
- 28.2% were neutral.

From the online course the survey results were as follows:
- majority of students found the technologies useful in their course work, (50%) 
- 41.7% agreed, 
- 8.3% strongly agreed, 
- 4.2% strongly disagreed, 
- 16.7% disagreed, and 
- 29.2% were neutral.

C. Finding: The technologies are flexible to interact with

From the traditional portion of the hybrid class the survey results were as follows:
- majority of students found the technologies flexible to interact with (76.7%),
- 67.4% agreed, 
- 9.3% strongly agreed, 
- 4.7% disagreed, and 
- 18.6% were neutral.

From the online portion of hybrid course the survey results were as follows:
- majority of students found the technologies flexible to interact with (68.4%),
- 60.5% agreed, 
- 7.9% strongly agreed, 
- 5.3% strongly disagreed, 
- 7.9% disagree, and 7.9% were neutral.

From the online course the survey results were as follows:
- majority of students found the technologies flexible to interact with (54.2%),
- 37.5% agreed, 
- 16.7% strongly agreed, 
- 4.2% strongly disagree, 
- 8.3% disagreed, and 
- 33.3% were neutral.

D. Finding: It easy to get the technologies to do what I want them to do

From the traditional portion of the hybrid class the survey results were as follows:
- majority of students found it easy to get the technologies to do what they wanted them to do, (71.4%),
- 64.3% agreed, 
- 7.1% strongly agreed, 
- 2.4% strongly disagreed, 
- 7.1% disagreed, and 
- 19% were neutral.

From the online portion of hybrid class the survey results were as follows:
- majority of students found it easy to get the technologies to do what they wanted them to do, (56.4%),
- 53.8% agreed, 
- 2.6% strongly agreed, 
- 5.1% strongly disagreed, 
- 5.1% disagreed, and 
- 33% were neutral.

From the online course the survey results were as follows:
- majority of students found it easy to get the technologies to do what they wanted them to do, (65.2%),
- 56.5% agreed, 
- 8.7% strongly agreed, 
- 4.3% strongly disagreed, 
- 4.3% disagreed, and 
- 26.1% were neutral.

E. Finding: The technologies in my course work enabled me to accomplish tasks more quickly

From the online course the survey results were as follows:
- majority of students found the technologies flexible to interact with (68.4%),
- 60.5% agreed, 
- 7.9% strongly agreed, 
- 5.3% strongly disagreed, 
- 7.9% disagree, and 7.9% were neutral.
majority of students found the technologies in their course work enabled them to accomplish their tasks more quickly, (51.2%),
- 44.2% agreed,
- 7% strongly agreed,
- 4.7% strongly disagreed,
- 11.6% disagreed, and
- 32.6% were neutral.

From the online portion of hybrid class the survey results were as follows:
- majority of students found the technologies in their course work enabled them to accomplish their tasks more quickly, (48.7%)
- 43.6% agreed,
- 5.1% strongly agreed,
- 7.7% strongly disagreed,
- 12.8% disagreed, and
- 30.8% were neutral.

F. Finding: It easy for me to become skillful at using the technologies

From the traditional portion of the hybrid class the survey results were as follows:
- majority of students found it easy to become skillful at using the technologies (71.4%),
- 64.3% agreed,
- 7.1% strongly agreed,
- 2.4% strongly disagreed,
- 2.4% disagreed, and
- 23.8% were neutral.

From the online portion of hybrid class the survey results were as follows:
- majority of students found it easy to become skillful at using the technologies (69.2%),
- 61.5% agreed,
- 7.7% strongly agreed,
- 5.1% strongly disagreed,
- 2.6% disagreed, and
- 23.1% were neutral.

From the online course the survey results were as follows:
- majority of students found it easy to become skillful at using the technologies (70.8%),
- 62.5% agreed,
- 8.3% strongly agreed,
- 4.2% strongly disagreed, and
- 25% were neutral.

G. Finding: Using the technologies would make it easier to complete my course work

From the traditional portion of the hybrid class the survey results were as follows:
- majority of students found the technologies made it easier to complete their course work (58.5%),
- 46.3% agreed,
- 12.2% strongly agreed,
- 4.9% strongly disagreed,
- 9.8% disagreed, and
- 26.8% were neutral.

From the online portion of hybrid class the survey results were as follows:
- majority of students found the technologies made it easier to complete their course work (46.1%),
- 41% agreed,
- 5.1% strongly agreed,
- 7.7% strongly disagreed,
- 7.7% disagreed, and
- 38.5% were neutral.

From the online course the survey results were as follows:
- majority of students found the technologies made it easier to complete their course work (52.2%),
- 43.5% agreed,
- 8.7% strongly agreed,
- 4.3% strongly disagreed,
- 17.4% disagreed, and
- 26.1% were neutral.

H. Finding: Learning to operate the technologies used would be easy

From the traditional portion of the hybrid class the survey results were as follows:
- majority of students found learning to operate the technologies would be easy, (71.8%),
- 56.4% agreed,
- 15.4% strongly agreed,
- 2.6% strongly disagreed,
- 7.7% disagreed, and
- 17.9% were neutral.

From the online portion of hybrid class the survey results were as follows:
- majority of students found learning to operate the technologies would be easy, (71.8%),
- 56.4% agreed,
- 15.4% strongly agreed,
- 2.6% strongly disagreed,
- 7.7% disagreed, and
- 17.9% were neutral.

From the online course the survey results were as follows:
• majority of students found learning to operate the technologies would be easy, (78.9%),
  • 76.3% agreed,
  • 2.6% strongly agreed,
  • 2.6% strongly disagreed, and
  • 18.4% were neutral.

From the online course the survey results were as follows:
• majority of students found learning to operate the technologies would be easy, (66.7%),
  • 54.2% agreed,
  • 12.5% strongly agreed,
  • 4.2% strongly disagreed, and
  • 29.2% were neutral.

I. Finding: Using the technologies would enhance my effectiveness with course work

From the traditional portion of the hybrid class the survey results were as follows:
• Majority of students found using the technologies would enhance their effectiveness with course work, (61.9%),
  • 54.8% agreed,
  • 7.1% strongly agreed,
  • 7.1% strongly disagreed, and
  • 11.9% disagreed, and
  • 19% were neutral.

From the online portion of the hybrid class the survey results were as follows:
• majority of students found using the technologies would enhance their effectiveness with course work, (51.3%),
  • 48.6% agreed,
  • 2.7% strongly agreed,
  • 8.1% strongly disagreed, and
  • 16.2% disagreed, and
  • 24.3% were neutral.

From the online course the survey results were as follows:
• majority of students found using the technologies would enhance their effectiveness with course work, (43.4%),
  • 39.1% agreed,
  • 4.3% strongly agreed,
  • 4.3% strongly disagreed, and
  • 17.4% disagreed, and
  • 34.8% were neutral.

J. Finding: Interaction with the technologies would be clearer and understandable

From the traditional portion of the hybrid class the survey results were as follows:
• majority of students found their interaction with the technologies used clearer and understandable, (51.2%),
  • 46.3% agreed,
  • 4.9% strongly agreed,
  • 7.3% strongly disagreed, and
  • 9.8% disagreed, and
  • 31.7% were neutral.

From the online portion of hybrid class the survey results were as follows:
• majority of students found their interaction with the technologies used clearer and understandable, (52.6%),
  • 50% agreed,
  • 2.6% strongly agreed,
  • 7.9% strongly disagreed, and
  • 2.6% disagreed, and
  • 36.8% were neutral.

From the online course the survey results were as follows:
• majority of students found their interaction with the technologies used clearer and understandable, (52.1%),
  • 47.8% agreed,
  • 4.3% strongly agreed,
  • 4.3% strongly disagreed, and
  • 8.7% disagreed, and
  • 34.8% were neutral.

K. Finding: Using the technologies would improve my performance in my classes

From the traditional portion of hybrid class the survey results were as follows:
• majority of students found using the technologies would improve their performance in class, (50%),
  • 42.9% agreed,
  • 7.1% strongly agreed,
  • 7.1% strongly disagreed, and
  • 9.5% disagreed, and
  • 33.3% were neutral.

From the online portion of hybrid course the survey results were as follows:
• majority of students found using the technologies would improve their performance in class, (47.3%),
  • 44.7% agreed,
  • 2.6% strongly agreed,
  • 7.9% strongly disagreed, and
  • 10.5% disagreed, and
  • 34.2% were neutral.

From the online course the survey results were as follows:
• majority of students found using the technologies would improve their performance in class, (37.5%),
  • 33.3% agreed,
  • 4.2% strongly agreed,
  • 8.3% strongly disagreed,
  • 12.5% disagreed, and
  • 41.7% were neutral.

L. Finding: Using the technologies would make it easier to do my course work

From the traditional portion of hybrid class the survey results were as follows:
• majority of students using the technologies find it easier to do course work, (57.5%),
  • 47.5% agreed,
  • 10% strongly agreed,
  • 7.5% strongly disagreed,
  • 12.5% disagreed, and
  • 22.5% were neutral.

From the online portion of hybrid class the survey results were as follows:
• majority of students using the technologies find it easier to do course work, (42.1%),
  • 36.8% agreed,
  • 5.3% strongly agreed,
  • 7.9% strongly disagreed,
  • 15.8% disagreed, and
  • 34.2% were neutral.

M. Finding: Plan to continue using the technologies in the future

From the traditional portion of hybrid class the survey results were as follows:
• majority of students plan to continue using the technologies in the future, (57.9%),
  • 55.3% agreed,
  • 2.6% strongly agreed,
  • 7.9% strongly disagreed,
  • 5.3% disagreed, and
  • 28.9% were neutral.

From the online course the survey results were as follows:
• majority of students plan to continue using the technologies in the future, (62.5%),
  • 54.2% agreed,
  • 8.3% strongly agreed,
  • 4.2% strongly disagreed,
  • 8.3% disagreed, and
  • 25% were neutral.

N. Finding: Intend to continue using the technologies in the future

From the traditional portion of hybrid class the survey results were as follows:
• majority of students intend to continue using the technologies in the future, (60.5%),
  • 51.2% agreed,
  • 9.3% strongly agreed,
  • 7% strongly disagreed,
  • 7% disagreed, and
  • 25.6% were neutral.

From the online portion of hybrid class the survey results were as follows:
• majority of students intend to continue using the technologies in the future, (50%),
  • 47.4% agree,
  • 2.6% strongly agreed,
  • 7.9% strongly disagreed,
  • 5.3% disagreed, and
  • 36.8% were neutral.

From the online course the survey results were as follows:
• majority of students intend to continue using the technologies in the future, (50%),
  • 47.4% agree,
  • 2.6% strongly agreed,
  • 7.9% strongly disagreed,
  • 5.3% disagreed, and
  • 36.8% were neutral.

O. Finding: Expect my use of the technologies to continue in the future

From the traditional portion of hybrid class the survey results were as follows:
• majority of students expect their use of the technologies to continue in the future, (59.5%),
  • 58.3% agreed,
  • 8.3% strongly agreed,
  • 4.2% strongly disagreed,
  • 4.2% disagreed, and
  • 25% were neutral.

From the online course the survey results were as follows:
• majority of students expect their use of the technologies to continue in the future, (66.6%),
  • 58.3% agreed,
  • 8.3% strongly agreed,
  • 4.2% strongly disagreed,
  • 4.2% disagreed, and
  • 25% were neutral.
52.4% agree,  
7.1% strongly agreed,  
7.1% strongly disagreed,  
7.1% disagreed, and  
26.2% were neutral.

From the online portion of hybrid class the survey results were as follows:  
• majority of students expect their use of the technologies to continue in the future, (57.9 %),  
• 52.6% agreed,  
• 5.3% strongly agreed,  
• 7.9% strongly disagreed,  
• 7.9% disagreed, and  
• 26.3% were neutral.

From the online course the survey results were as follows:  
• majority of students expect their use of the technologies to continue in the future, (66.7%),  
• 54.2% agreed,  
• 12.5% strongly agreed,  
• 4.2% strongly disagreed,  
• 8.3% disagreed, and  
• 20.8% were neutral.

V. CONCLUSIONS
Technologies can bridge the instructional gap that faculty and students face. It is important for faculty to embrace technology in teaching. In all cases 75% or more of all participants either strongly agree, agree, or were neutral on the following concerning technology in the classroom:  
• Easy to use,  
• Useful in course work,  
• Flexible to interact with,  
• Easy to get technology to do what you want,  
• Easy to become skillful using technology,  
• Learning to operate is easy,  
• Makes interaction clearer and understandable, and  
• Plan/intent/expect to continue to use in future.

Educators need to be mindful which technologies will be effective and which will not when designing courses. Incorporating new technologies, recognizing differences in learners, and making revisions to curriculum can enhance the learning process. New trend setting technologies are leading to significant changes in teacher-student relationships as well as relationships between students themselves.

If technology is utilized in a course, it is important for the instructor to build confidence in the learner’s use of technology. If interactive assignments or activities are used for a course it could involve utilizing an asynchronous and/or synchronous environment. As perceived ease of use and perceived usefulness increases so does productivity. It also suggests a positive attitude toward the use or integration of CMC’s into the classroom, regardless of modality.

As students are exposed to more technology, hopefully their attitude towards technology will improve, which is perceived as enhancing their performance. They will view technology as easy to use and be willing to explore new technologies in the future.

VI. REFERENCES

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