Enhancing Blended Courses to Facilitate Student Achievement of Learning Outcomes

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Abstract: Blended learning is a student centered flexible, self-paced multi model approach to learning. WebCT provides a secured location where faculty can place course materials, including syllabus, assignments, lectures, and presentations. The aim of this study was to compare between students achievement & satisfaction in classical and blended course format. The participants in this study were 158 Saudi female Students who enrolled in information technology for nurses' course. Six tools were used in this study: 1) 2 quizzes included 30 multiple-choice questions each, 2) midterm exam included 40 multiple-choice questions, 3) final exam included 60 multiple-choice questions, 4) assignments included different assignments related to the course, 5) Student Satisfaction Survey, 6) Teacher/Course Evaluations, University of Dammam. The results of this study indicated that students in blended course format have a higher achievement and satisfaction than student in classical course format.
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1.Introduction

Teaching-learning process is the heart of education. It depends on the fulfillment of the aims & objectives of education. It is the most powerful instrument of education to bring about desired changes in the students. Learning is the relatively permanent change in an individual's behavior or behavior capability as a result of experience or practice. Teaching is not only giving knowledge or skills to students but also providing opportunities for them to produce relatively permanent change through the engagement in experiences provided by the teacher (TLP, 2012). However, teaching and learning are no longer limited by place or time. Large numbers of educational institutions are now using blended course with WebCT or Blackboard. WebCT provides a secured location where faculty can place course materials, including syllabi, assignments, lectures, and presentations (Kanti, 2011).

Traditional or classical teaching approach is mostly teacher centered. In Classical teaching approach, instruction occurs frequently with the whole class (face-to-face class), teacher talk exceeds student talk and use of class time is largely determined by the teacher (Chan, 2011).

Blended learning is a student centered flexible, self-paced multi model approach to learning. Blended learning is becoming widespread in use and its alternative names are mixed learning, hybrid learning, blended e-learning. Blended learning combines online with face-to-face learning. The goal of blended learning is to provide the most efficient and effective instruction experience by combining delivery modalities (Shibley, 2009). Blended course combines Classical delivery with online teaching resources to enhance the quality of the learning experienced by its students. It has been argued that, on the pedagogical level, blended learning allows faculty to integrate the best of the online learning environment with the best of the face-to-face learning environment (US Department of Education, 2009).

WebCT is a course management system that enables the delivery of online education. With a complete set of teaching and learning tools for course development, course delivery and course management, WebCT provides a system for student learning and an efficient solution for faculty of all experience levels (Reeves *et al.,* 2002). WebCT is a tool that facilitates the creation of sophisticated World Wide Web-based educational environments. It provides instructional tools to support course content such as a glossary, references, self-test, and quiz module. WebCT gives faculty the course management tools for grading, tracking student interaction and monitoring class progress (Zapalska, 2003). These tools are only available to the students and the professor of a given course. This means that the intellectual property of the staff and the privacy of the student, as well as the course content, are protected from external parties (Kanti, 2011). It integrates communication tools, including a Discussion board, Chat room, private e-mail, and calendar in one place (a course website), to facilitate interaction between faculty and students.

Discussion board can be a great way improve student learning in a blended learning environment. Discussion topic online, asynchronously, can be just as

beneficial as classical, synchronous, in class discussion (Discussion Board, 2012). Discussion Boards give student's time to research an idea and time to respond. In WebCT the Discussion Board can be customized for topics and discussion groups. For students working on projects the Discussion Board can be a central communication station for their group and students do not have to worry about other groups seeing their communication (Berner, 2003).

Chat is an online environment which allows participants to have real time discussions. A few students dominate; the chat environment gives all students equal opportunity to express themselves uninterrupted. Chat can be used to discuss a topic, students' understanding of project requirements, students' concerns, or anything else for that matter. WebCT provides a log of Chat discussions. Students are able to put this log, highlighting their participation, into their end of semester portfolios (Discussion Board, 2012).

A glossary which provided through WebCT allows student to click on words they don't know. Teacher can use a link to many online dictionaries for this purpose. Students have to read through the definitions and decide which one applies in the given context (Berner, 2003). Quizzes are not just for marks. Teacher can use them all the time to review vocabulary and other content. Students answer the quiz and then check their answers and their comments. Students are able to include their quizzes in their end-of-semester portfolio (Discussion board, 2012). Websites / Weblogs / Wikis, are all options to allow students to publish on the web or conduct discussions with a larger audience than is available through WebCT or an Intranet site. Students can develop their own websites and post them on either internal or external servers, which give them access through e-mail or feedback forms to an audience far beyond their classroom walls (Potter *et al.,* 2006).

Blended learning is thus a flexible approach to course design that supports the merger of different times and places of learning, offering some of the convenience of fully on-line courses without the complete loss of face-to-face contact. This is one of the reasons that blended learning courses have been well-received (Sikora, 2002).

Many studies have centered on student satisfaction with this type of learning as well as the grade earned for the course (Marino, 2000, Sikora, 2002, & Gibson, 2008). In their study comparing courses entirely on-line with traditional face-to-face, Sikora and Carrol (2002) reported lower satisfaction ratings with the fully on-line course(s) compared to the traditional course(s) (Sikora, 2002). While Marino (2000) noted that, to be successful in fully on-line courses, the student needs to be an independent and self regulated learner, which is not always the case (Gibson, 2008). Although there are negative attributes to fully on-line courses, the blended learning format attempts to limit negative attributes by having some face-to-face interaction in the course. Certain courses naturally lend themselves to this type of design (Marino, 2000).

Significance of the study:

WebCT is a new web course tool at University of Dammam and it was a new step for the instructors to challenge a new course tool in College of Nursing. Instructors were brave to know whether or not there a difference in learning outcomes and/or a difference in student satisfaction arising from delivery of a course in a Classical classroom setting or blended course. Thus, the aim of this study was to compare students' outcomes & satisfaction between classical and blended courses.

2. Material and Methods

Research Design: A descriptive research design was used in this study.

Setting: This study was conducted on:

1. Computer labs, College of Nursing, university of Dammam.
2. Class rooms, College of Nursing, university of Dammam.

Subjects: The sample of this study consisted of 158 undergraduate students' enrolled Information Technology course offered in the two groups of first year, second semester, and academic year 2009/10. The two groups participating in this study comprised all of the sections offered during the academic term studied. Group one divided into 2 sections each section contains 40 students and taught through blended course format using WebCT. Group two contains 78 students were taught through classical-based course.

Instruments: Six tools used in this study:

Tool one – 2 quizzes included 30 multiple-choice questions each.

Tool two – midterm exam included 40 multiple-choice questions.

Tool three – final exam included 60 multiple-choice questions.

Tool four – assignments included different assignments related to the course.

All questions used in three exams selected by the instructors from the prepared test bank. The exams themselves contained a different mix of topics, as well as assignments to measures student knowledge, cognitive, and effective interaction.

Tool five – included Student Satisfaction Survey (Centra, 1993). It consisted of a modified Students'

Evaluation of Educational Quality (SEEQ). The SEEQ variables: strongly agree (SA) 5, agree (A) 4, neutral (N) 3, disagree (D) 2, and strongly disagree (SD) 1. All students in both groups completed this portion of the survey upon termination of the course after completing the final exam.

Tool ool six – Teacher/Course Evaluations, University of Dammam. At the end of semester Teacher/Course Evaluations, standardized across all disciplines and departments at the University, were complete by all students. The Teacher/Course evaluations form uses a five-point scale: very good (5), good (4), satisfactory (3), poor (2), and very poor (1).

2. Method and procedures

The course offered was an undergraduate introductory course in Information Technology. The nature of the course was students using different applications and software on the computer via different assignments. The instructors prepared the assignments, text, web materials, and a broad examination test bank manually then transferred to course formats computerized and electronically through WebCT. Four instructors taught three sections, the classical section covered by two instructors, and two blended WebCT sections covered by the other two qualified instructors. Three sections covered substantially similar material, completed similar assignments, and applied the same quizzes, assignments, & exams.

Classical section: its format included one face-to-face lecture given weekly assisted by the use of PowerPoint slides. The course was offered in a lecture/discussion format with hands-on individual and group assignments. Testing was accomplished through multiple-choice exams using questions developed by the instructors, and administered in class. The instructors served as disseminators of knowledge in a lecture format, delivering the information and answering questions asked by the students.

Blended WebCT sections: Classes met briefly once a week for each group to go over hands-on assignments similar to the ones in the classical format, as well as for testing purposes. Course materials in the form of lectures on streaming media, lecture notes, text based supplementary materials, discussion groups, and quizzes were offered through WebCT. Test questions were drawn from the same test bank used for the classical section. The blended course met once a week and was limited to a maximum of 40 students per section. Each in-class meeting included a brief lecture, no more than 10 minutes, plus 40 minutes of in-class "active learning" activities: discussions, debates, worksheets, group projects, and group presentations. There were many chatting and communication via discussion board in student learning environment. uses a 5-point Likert scale with the following Discussion topics online were asynchronously, and synchronous in class discussion. The instructor served as the guide to learning and not as a disseminator of knowledge. Four exams were given were not identical, they covered the same content materials and the questions were from the prepared test bank. The blended section focused on content delivery, course management and extension of the in-class discussion to the web. The on-line components consisted of PowerPoint presentations with a corresponding note sheet, homework assignments. The same scope and sequence was followed by both the Classical and blended sections.

Statistical analyses

At the end of semester all data were ready to be analyzed. Blended and classical sections were compared for acquisition of knowledge and mastery of material content. Descriptive statistics, mean and standard deviation were reported for assignments, 2 quizzes, midterm, final exam and final course grade. Independent T-tests determined statistical significant differences between groups. All statistical tests were performed using $p < 0.05$ and 0.01 as the level of significance. All data were analyzed using the statistical software package SPSS (Version 19.0).

3. Results

Table 1 shows Independent T-Tests considered to determine significant differences between the blended and Classical students. There is no significant differences were noted in the quiz 1 and assignment score difference between blended and classical group. While blended sections significantly correlated to the classical section in quiz 2, midterm, and final exam with p=0.003, 0.042, and 0.028. Final course grade was significantly higher for blended students than classical students, with the former mean score of 77.56 and the later of 76.82 (p = 0.021).

Table 1: Classical and Blended Sections for Overall Students Performance (n=158)

Source of Variation	Blended Mean (SD)	Classical Mean (SD)	T Value	Sign.
Quiz1	66.51 (2.07)	74.26 (0.95)	-0.684	0.494
Quiz2	77.99 (1.06)	68.76 (2.04)	3.011	0.003*
Midterm	82.84 (1.24)	82.12 (1.36)	1.665	0.042*
Final Exam	79.63 (1.90)	78.15 (1.08)	-2.211	0.028*
Assignments	85.54 (0.84)	86.56 (0.95)	0.112	0.814
Final course grade	77.56 (1.52)	76.82 (1.04)	1.066	0.021*

Table 2 illustrates students' satisfaction at the end of the course. From 12 questions that comprised the SEEQ, nine were rated higher means and standard deviations for the blended sections design as follow; class size is appropriate 4.23 (0.652), the class activities were attractive 3.38 (0.947), the class environment was inviting 4.68 (1.087), the class was fun4.18 (0.703), students enjoyed going to class 4.42 (0.632), students felt comfortable to voice my opinion in class 3.90 (0.950), students learned from my peer experiences 3.63 (0.898), students felt comfortable approaching the instructor 4.18 (0.703), students would recommend this class to a friend 4.85 (0.96). Table also show that a composite score for the SEEQ was calculated, and found overall mean was higher for the blended sections (55.27) than the classical section (50.04).

Table 2: Students' Evaluation of Educational Quality for Blended versus Classical sections (n=158)

	Blended Mean (SD)	Classical Mean (SD)
Class size is appropriate.	4.23 (0.652)	3.63 (0.898)
The class activities were attractive.	3.38 (0.947)	2.99 (1.164)
The class environment was inviting.	4.68 (1.087)	3.69 (0.904)
The class was fun.	4.18 (0.703)	3.10 (1.074)
I was bored in class.	3.54 (1.056)	3.94 (0.939)
I enjoyed going to class.	4.42 (0.632)	3.80 (1.018)
I felt comfortable to voice my opinion in class.	3.90 (0.950)	3.39 (0.963)
I learned from my peer experiences.	3.63 (0.898)	2.86 (1.032)
I felt my presence was valued in the class.	2.99 (1.164)	3.13 (0.985)
I felt comfortable approaching the instructor.	4.18 (0.703)	2.77 (1.146)
The instructor encouraged class discussion.	3.54 (1.056)	3.83 (0.941)
I would recommend this class to a friend.	4.85 (0.96)	3.52 (1.241)
*Composite Teacher Evaluation Score (Q1-Q12)	55.27 (6.853)	50.04(9.15)

Figure 1: demonstrate significant differences for total mean scores of Students' Evaluation of Educational Quality (SEEQ). The total scores between the blended (55.057) and classical (51.945) were significantly different between two group formats with (p<0.005) which indicating that students applied blended course format judged the quality of education to be higher than students applied classical course format.

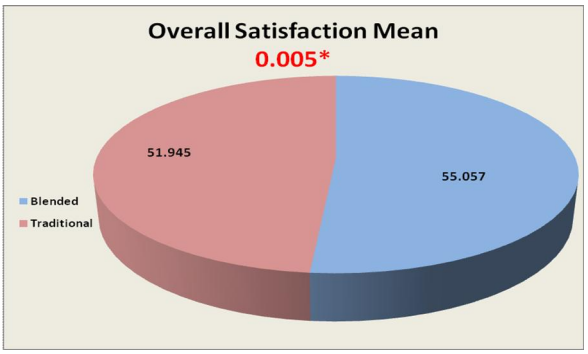

Fig. 1: Overall Course Satisfaction between Classical and Blended sections (n=158) Standardized Teacher /Course Evaluations

As part of university protocol, standardized teacher/ course evaluations were administered at the end of the semester for each course. Overall means and standard deviations are reported for each question, divided between blended and classical course designs. Table 3 shows combination of teacher/course score as the aggregated total of the individual questions. Students in the blended course consistently rated the teacher and course higher. It demonstrates tests for statistical differences of individual questions as well as the composite scores. Interestingly, blended group of students rated the course significantly higher than the classical group of students (with p=0.002) and felt the course focused more on course objectives (with 0.024). Furthermore, blended group of students felt the instructors encouraged class participation and discussion (with p=0.003), was more available to students (with p=0.018), was more helpful to students (with 0.030), and was more interested in the material (with p=0.041). In addition, blended group of students rated the instructors significantly higher than the classical group of students (with p=0.003) and their level of interest in subject after taking this course (with p=0.050). Finally, the composite teacher evaluation score was significantly differences between blended group of students and classical group of students (with p=0.013).

Table 3: Course and Instructors Evaluations between Classical and Blended sections (n=158)

	Blended Mean (SD)	Classical Mean (SD)	T Value	Sign.
Overall, how would you rate this course?	3.78 (0.872)	3.03 (1.242)	3.976	0.002*
Degree to which important points were stressed?	3.62 (0.925)	3.67 (0.998)	0.288	0.774
Instructors' preparation for this course?	3.94 (0.938)	3.72 (0.940)	1.284	0.201
Instructor's encouragement class participation, discussion?	4.01 (0.931)	3.45 (1.157)	3.055	0.003*
Organization of course material was?	3.93 (0.863)	3.67 (1.049)	1.504	0.145
Clarity of presentation of course material?	3.94 (1.056)	3.79 (1.022)	0.804	0.413
Degree to which tests/graded activities reflected content?	3.78 (1.123)	3.55 (1.187)	1.124	0.321
Instructor's availability to students?	3.93 (0.810)	3.53 (1.158)	2.242	0.018*
Instructor's helpfulness to students?	3.90 (0.942)	3.50 (1.128)	2.171	0.030*
Degree to which class focused on course objectives?	3.96 (0.945)	3.52 (1.173)	2.370	0.024*
Instructor's interest in content/material of course?	4.10 (0.860)	3.76 (1.031)	2.043	0.041*
Overall, how would you rate the instructor?	4.12 (1.008)	3.53 (1.188)	2.985	0.003*
Level of interest in subject before taking this course?	2.84 (1.052)	2.60 (1.091)	1.244	0.314
Level of interest in subject after taking this course?	3.23 (1.250)	2.81 (1.131)	1.976	0.050*
Composite Teacher Evaluation Score (Q1 – Q14)	53.09 (9.964)	48.16 (12.151)	2.513	0.013*

4.Discussion

Blended Learning is widely promoted in higher education worldwide. The use of online resources is one of the key components in blended learning. The present findings indicated that both the blended and Classical course formats effectively presented materials and enhanced knowledge levels of students enrolled in a course. However, significant differences were found in achievement and satisfaction between the blended and Classical groups.

Significant differences were noted also between achievement scores in the quiz two, mid-term, and final exams scores between the blended and Classical courses. It may reflect the effective use of online resources in blended learning that assist students in achieving specific learning outcomes. Moreover with the facilitation and guidance of teachers and a well-designed course learning mode, most students were able to use relevant online resources effectively and efficiently among the overwhelming information on the web.

Thus, it can be suggested that the blended course format provided the higher degree of knowledge achievement. This is somewhat predictable with the online and World Wide Web course format. This finding has been somewhat controversial in the literature, as some studies have found that there is no difference (Rivera, 2002), while others have found that either online or Classical courses perform better than the other. It may be that certain courses cannot effectively present materials in an online format (Allen *et al.,* 2004). On the other hand, Faux study 2000 found that there was a significant difference between the Classical and online groups, where the Classical group scored significantly higher than the online group on posttest.

There are, however, more studies that look at on-line learning compared to Classical course formats, for which researchers have found similar results of no differences between the groups (Allen *et al.,* 2004 & Block *et al.,*2008). Thus, findings originate from the present study fluctuate with most previous studies. However, it indicates that student performance in blended sections significantly higher than the classical section. This finding provides an influential argument to the classicalists that effective learning can take place in non-classical learning environments. Our finding confirm that the learning resources in blended learning settings provide the content and course materials that learners access appropriate to achieve the planned learning outcomes.

Satisfaction has been widely used as one of the important parameter to evaluate learning effectiveness in academic institution (Block *et al.,*2008). Higher

student satisfaction is the results of good learning. In addition the present study found significant differences in course satisfaction between the blended learning sections and the classical section, with blended learners reporting a higher level of class satisfaction. The blended learning design focused on active learning in the classroom portion of the course; the students might have rated higher satisfaction due to the enjoyment of the blended design.

There is very limited research on satisfaction in the blended course format. However, the current study found that the mean satisfaction scores were significantly different between the blended and Classical courses. This may due to consideration when providing educational alternatives is whether students enjoy the alternative forms. Rovai & Jordan (2004) looked at the course satisfaction as it relates to the classroom community: connectedness and learning community. They found a higher rating of satisfaction in the blended learning course compared to Classical and online formats. Furthermore, Rivera (2002) found only a lower satisfaction level in on-line compared to Classical and blended learning courses, and no difference between Classical and blended courses. Several studies have looked at class satisfaction of exclusively on-line course compared to Classical with mixed findings.

Allen *et al.* (2002) found that students in web-based format appear to be as satisfied as those in Classical formats. Furthermore, Pereira et al., 2007, found no significant difference in satisfaction of blended learning compared to Classical formats; yet, they found a significant difference in achievements scores, with higher achievement scores found in the blended learners. With this mixed support in the literature, the authors believe the achievement and satisfaction is dependent on the quality of the online and classroom design. Interpersonal skills and communication between students via WebCT may encourage and motivate them for using blended learning. In addition, online learning via discussion board was facilitating cognitive learning outcome.

It is important to preface the following observations by stating that this was the first time a blended class using WebCT was offered in college of nursing, University of Dammam. Instructors had experiences with the web previously to enhance classical class formats there and in another country. This was therefore a learning experience, and although efforts were made to follow recommendations, mistakes were made. Several areas that adversely affected the conduct of the blended class were consistent instructional support, and course material delivery difficulties.

Conclusions and Recommendations

The current study on student achievement and satisfaction scores presents interesting findings, and challenges the educator to question teaching strategies, methodologies and content delivery. The blended model offers to the more classical educator a merger between classroom contact and advanced technology. The student, with their proficiency and use of technology, is comfortable with this academic structure as well. As student ways and means of knowledge acquisition transform, leaning more toward technology for rapid information dissemination and self-paced intrinsic attainment, educational structures and instructors must adapt as well.

This research represents an initial attempt in Saudi Arabia to measure student achievement and satisfaction in blended versus Classical course formats. Results purporting higher learning achievement and satisfaction by the students most likely were impacted by the more active classroom teaching approach utilized in the blended course format. This phenomena needs to be investigated more fully. A blended course format may actually lend itself to more active teaching due to students becoming more responsible for learning content on their own time, while classroom time is spent with application of newly acquired knowledge. Active learning may also account for the student higher grades in the blended course format.
Recommendations originating from the study include repeated research on achievement and satisfaction among different course formats accompanied by longitudinal studies to determine any long-term effectiveness.

- An important consideration will be whether students can continue to have acceptable achievement and satisfaction scores when blended course formats are applied to upper level courses of nursing program with more specialized content material.
- One may find that initial documented success of the blended format may be limited to lower level undergraduate courses.
- As future research studies continue to document effectiveness of the blended articles, educators will be challenged to embrace new teaching practices and methodologies.

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