A Needs Assessment of Online Courses in Blackboard for Undergraduate Students

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Abstract: The purpose of this research study was to measure the gap between the current state of online classes in Blackboard and the needs of undergraduate students enrolled in online courses at a major western university, and to find possible improvements to Blackboard that will help meet the needs of students. The condition of online courses in Blackboard at the university was determined based on the analysis of data collected from a survey, interviews, and a literature review. The final results of the research address student perceptions of Blackboard in terms of its ease of use, presentation of instruction based on a variety of learning styles, and student suggestions for possible improvements.

Keywords: online, course, Blackboard, undergraduate, needs assessment, satisfaction

Introduction

Perspectives on online distance education are universally expanding, without time and space limitations, with the assistance of not only advancements in technologies and learning environments, but also the growing acceptance and popularity of online course offerings (Eom, Wen & Ashill, 2006). Rates of enrollments in online education have far exceeded the increases of higher education students in the US (Allen & Seaman, 2010).

According to Allen and Seaman (2010), as of fall 2009, the estimated number of online enrollments in degree-granting post-secondary institutions showed a consecutive increase of twenty-one percent by the fall semester of 2008, to a total of 5.6 million online students. The importance of online courses in higher education is steadily increasing, with nearly thirty percent of higher education students enrolled in online courses. Moreover, Allen and Seaman reported that, in a survey of academic leaders from more than 2,500 colleges and universities nationwide, those who felt online education had a critical role in their long-term strategy had risen to 63.1% in 2010, from 50% in 2002.

However, online courses may not be meeting the needs of the diverse learners in higher educational settings. A number of indicators of user satisfaction for online courses, in higher education, have shown that learners found their experiences with online education dissatisfying (Eom, Wen & Ashill, 2006). Online learning has been criticized as a passive learning environment, equal to sitting in the back of the classroom (Sharp & Huett, 2005). Furthermore, designers and instructors of online classes may not always consider the diversity of students' learning styles, which encompass the four types of the physiological dimensions of learning styles, such as visual, aural, read/write, and kinesthetic (Drago & Wagner, 2004).

The purpose of this study was to analyze the gap between the present online learning systems in Blackboard and the needs for online education of undergraduate students at one major western university.

The performance gap was analyzed in four areas: motivation, learning styles, course structure, and interaction. Based on the analysis we suggest specific, acceptable, and executable alternatives to the current state of online education systems in higher education, as exemplified at this university.

Literature Review

Motivation

The motivation of the online learner has been defined as the intrinsic desire to achieve a goal or an end (Eom, Wen & Ashill 2006). This is a critical concept when researching and examining the future success of students in online learning environments. Motivation of the online student can be separated into three categories: Intrinsic, Extrinsic, and Self (Kim & Frick, 2011). The intrinsic desire to achieve is central to the success of any student participating in online education (Sahin & Shelley, 2008). Extrinsic motivation can be fostered by how the online classroom is set up in terms of student perception of material covered and the interactions between participants (Sharp & Huett, 2005). Self-motivation is how the students see their ability in terms of confidence and ability to succeed (Lim, 2004). All three concepts play an important role when students sign up and participate in online or distance education.

Kim and Frick (2011) argue that participating in an online class takes self-discipline and motivation. A student taking a class online needs to have the drive and desire to be educated. Learners who are motivated tend to have more positive results with both online classes and the material learned (Kim & Frick, 2011). Intrinsic motivation can be increased when the subject matter the student is learning is relevant, and has a purpose.

When examining extrinsic factors of student motivation in online education, characteristics of the online learning, reasonable workload requirements, and academic support are essential for a successful learner. Workload issues can decrease the motivation of the student in an online environment (Kim & Frick, 2011). Instructors can foster student engagement by requiring a reasonable amount of relevant work. If instructors require too much work, as perceived by students, they may not become engaged to get the work done. Conversely not requiring enough relevant work may make students see assignments as busy work, with little to no relevance.

The instructor can provide positive, constructive feedback as one method of supporting the student (Lim, 2004). Students taking online classes can improve the quality of their work by applying their instructor's feedback. Online instructors should endeavor to create a climate of positive learning for the student (Kim & Frick, 2011). Positive interactions between the instructor and the learner will foster greater motivation to complete work, and create a positive experience for students in an online learning environment (Sharp & Huett, 2005).

The perception of a learner plays a vital role in motivating learning in an online class. Student motivation may decrease if the learning style of the student does not match well with the teaching style of the teacher (Kim & Frick, 2011).

In summary, many factors affect a learner's motivation when taking an online class. Intrinsic motivation, extrinsic motivation, and self-motivation all may be influenced by the structure of the class, the communication of the instructor and the learners' own confidence in being successful in an online class.

Learning Styles

The diverse learning styles of individuals encompass many different ideas, but the idea at the core is that learners are not homogeneous, but are diverse individuals, with a variety of instructional needs and approaches to learning The various models of learning styles attempt to identify significant learner characteristics so that instruction can be optimized by adapting it to each learner's unique needs. Coffield, Mosely, Hall, and Ecclestone (2004), for instance, categorized learning styles into five major groups: constitutional, cognitive, personality type, learning preferences, and learning approaches. Hawk and Shah (2007) described the VARK model, which defines learning styles by sensory input, (visual, auditory, read/write, and kinesthetic). These researchers hypothesize that individuals have preferences for processing and communicating information through one or a specific combination of these channels. The implication of this theory is that students will learn best when instruction is delivered through channels that the learner prefers. The beauty of the theory is that it is very easy to adapt the type of instruction provided, based on a given student's learning style. Peter, Bacon, and Dastbaz (2010) have argued that one of the most significant problems associated with learning styles is that no one has produced a "proven recipe" for adapting learning based on learning styles. They cite this as one reason for the appeal of the VARK model. Zajac (2009) proposed that one approach is to create multiple learning resources for the same instructional objective in a variety of formats. She explained that these learning resources, known as Reusable Learning Objects, (RLO), can be reused and recombined to meet the needs of learners with specific learning profiles.

Although there is thus disagreement about the best way to define and measure the differences of learners, one of the implications of the learning style

research is that students can benefit from learning in a variety of ways to process information. The VARK model may provide a map for diagnosing and delivering content specific to student preferences.

Course Structure

As with other factors in online education, such as motivation, learning style, and interaction, course structure may affect not only student satisfaction, but also the extent of skills and knowledge that learners obtain from online courses. The course structure plays a significant role in determining student satisfaction and the quality of online education systems, and is a decisive element that affects the successful outcome of online distance education (Eom, Wen, & Ashill, 2006).

According to Moore (1991), course structure represents the firmness and flexibility of online education systems. That is, the educational objectives, teaching strategies, and evaluation methods of online courses all fall under course structure. Moreover, Moore (1991) argues that the design of online instructional courses determines the extent to which online courses can adapt to or comply with diverse learners' needs in order to employ diverse teaching strategies, effective environments, and rich instructional media.

Eom, Wen, and Ashill (2006) have postulated that course structure has two essentials, course objectives and course infrastructure. Course objectives include particular information related to an online course, such as topical issues to be addressed, expected workload, desired types of class participation, assignments, projects, and the like. Course infrastructure, according to these researchers, is related to the overall ease of using the web site in an online course and the organization of course materials. In other words, learners should be able to not only interactively and contextually use the web environment of an online course, but also utilize various course materials efficiently and effectively.

Arvan, Ory, Bullock, Burnaska, and Hanson (1998) examined a number of studies in which improvements were made to online course structure. They found that a number of simple redesigns of the course structure resulted in increasing the number of students enrolled in an online course. Improving grading systems and counting on peer support resulted in improved learner engagement.

On the other hand, Eom, Wen, and Ashill (2006) contended that changes to an online course structure only resulted in a favorable degree of students' satisfaction with the online course. This may be interpreted to mean that a better measure of the quality of learning activities are other learning factors, such as interaction, feedback, and the like, rather than the usability of the online course. In other words, meaningful feedback that occurs among students or from an instructor may have a greater impact on perceived learning outcomes than does course structure.

Interaction

Participating in an online course requires 21st century skills that are rapidly and constantly changeable. One of the most enlightening successes of online education is that dialogue and learning can incorporate collaborative models of learning and decrease instructor-dependency. Of note, however, are the drawbacks that may be involved in interacting online. Technology may not compensate for the superiority of face-to-face communication. However, the inconvenience of traveling to campus has been replaced by anytime, anywhere online accessibility and affordability (King, 2002).

Landry, Griffeth, and Hartman (2006), in their study indicated that students found the elements associated with course content, such as the class documents, lectures, announcements and quizzes were viewed as more useful than the tools for interaction and support, i.e. discussion boards, emails, faculty information and external sites.

"Students often report that their favorite features of the Blackboard system are around-the-clock access to course materials (especially when they have misplaced something) and ready access to their grades in a private, secure medium" (Loubert, 2004, p. 99). In 2011, Blackboard upgraded a component package called Blackboard Collaborate™. This conferencing platform enables both students and instructors to experience a virtual classroom directly in the Blackboard course structure. Students have access to live virtual sessions and recordings with a single click, and greater opportunity to interact in real time in social learning opportunities with peers and instructors. They benefit from live, dynamic interaction in the online learning environment.

In May of 2007, for example, Blackboard enabled students to more actively engage in their academic lives by providing notifications and course updates sent via Facebook. This is an elective application and when enabled, students can receive class information on new assignments, discussion board postings, course materials, and even new grades while logged in to their Facebook accounts. Additionally students can connect with their classmates via Facebook, giving them more opportunity to turn social interactions into collaborative student-to-student learning efforts.

After a thorough review of the literature, the researchers designed the present study in order to

measure the gap between the current state of online classes in Blackboard and the needs of undergraduate students enrolled in online courses at this major western university, and to determine possible improvements to Blackboard and the online courses in an effort to better meet the needs of students at the university. The researchers employed a student survey, as well as interviews with two faculty members and an online expert, to collect the primary data. The study, therefore, was designed to examine student perceptions of Blackboard in terms of its ease of use, presentation of instruction based on a variety of learning styles, and student suggestions for possible improvements.

Method

Participants

The participants in this study were 56 undergraduate students who were enrolled in at least one online class at a major western university in 2011. These 56 participants were those who responded, of 100 students enrolled in two undergraduate online courses at the university. The two instructors from the same online courses as the survey participants, as well as one expert from the department of information management and technology at the university, also participated in focus group interviews.

Measures

The primary data were collected through the use of an online survey. The survey, developed by the researchers, included 44 questions; 34 of these questions employed a Likert-type scale that measured students' perceptions of the online courses they had taken in 2011. In order to gain a broader picture of students' experiences with online courses, ten additional questions were used that asked students about their preferences, and for their suggestions for improving the online education environments at the university. Nine of these questions consisted of checklists and one was an open-ended question. (See Appendix A).

In addition to the data gathered using the student survey and results of the literature review, interviews with the two course instructors and one online education expert from the university were also employed in order to gather deeper data, with the goal of enabling the researchers to suggest recommendations for developing more satisfactory online education systems and courses at this university, ultimately, with implications for higher education in general (See Appendix B).

Procedures

The researchers administered the student perception survey to students in two undergraduate online classes at the   university. The classes were chosen because they met two criteria: they consisted of more than forty students, and more than eighty percent of the class was online. The survey was given to approximately 100 students taking at least one online course and 56 participants out of 100 responded to the survey. The selected students completed the online survey within a one-week window.

The two course instructors and one additional online education expert at the university were also interviewed to gain their perspectives on online education and their recommendations for possible changes to the system in order for them to be able to create and deliver more satisfactory online courses. The two faculty members were selected as interviewees because they have been managing quite a few online courses at the university. The expert on online education systems at the university was selected to be interviewed as his primarily responsibility is to maintain the university's online education systems and gather feedback from students and faculty members at the university. These three individuals were asked about their perceptions and ideas about online education systems at the university, and about such issues as students' feedback and complaints about online courses.

Data Analysis

All data were used to describe the current state of online education systems in Blackboard at the university. By examining the needs assessment survey data, students' perceptions and levels of satisfaction could be described, yielding a potential gap between students' expected satisfactory online class experiences and the observed perceptions of their online courses. Frequencies of students' responses and participants' preferences were determined. In addition, the outcomes of the interviews with the two faculty members and one online education expert were employed to develop recommendations for more satisfactory online education systems at the university.

Reliability

To determine the internal consistency of the survey questions, Cronbach's Alpha analysis was conducted on the 34 multiple-choice questions out of all 44 questions in the survey. The value of Cronbach's Alpha on these questions was 0.844, which can be interpreted to mean that the 34 Likert-scale type survey questions have strong internal consistency.

Student Motivation

The findings of the literature review indicate that there is a noticeable gap between students who succeed and students who do not. One of the aspects of greater motivation is the student's perception of the class and the class work requirements (Sahin & Shelley, 2008). Results on the survey questions related to motivation indicated that students were confused about the format and objectives of most of the classes. Students reported that they had a difficult time navigating through links and communications; as a result they became unmotivated to continue working. One participant in the survey stated that he or she did more work in the online classes for the same amount of credit than in a face-to-face class. Online classes need to meet the students' assigned work expectation in relationship to a comparable traditional class.

Motivation was also decreased due to the confusion caused by unclear course objectives. One participant stated that the class did not follow the posted guidelines. The survey results indicated that over 78% of students felt more motivated when taking a face-to-face class than when they are taking an online class. (See Figure 1). This can be compared to the 52.6% of students who indicated that they felt that online classes

were less important than offline courses. Because students did not find value in the classes they took online they were less motivated to take the classes and found participating in online classes more difficult. From the literature review, Kim and Frick (2011) indicated that if the workload is not relevant to the student, motivation decreases. The present survey results support those of Kim and Frick (2011), who reported that students did not find value in the online learning environment, and that the size of the workload during the class will increase or decrease the motivation of the student.

Results of the present survey tend to support this position; 61.4% of students reported having a difficult time staying updated on the course work demands. In the open response section of the survey one student stated: "I found myself being very confused with the online class and received a lot of email from other confused classmates trying to figure out what exactly the assignment was or how to do it". Time spent navigating through the purpose or requirements of an assignment can add to the overall workload of a class. Without clear, well written, workload lists, students can be left trying to figure out what is required of them. This confusion can add to a lower personal confidence level in the students' own ability to complete or accomplish tasks. These factors are evident in the survey, as 63% of students stated that they found taking
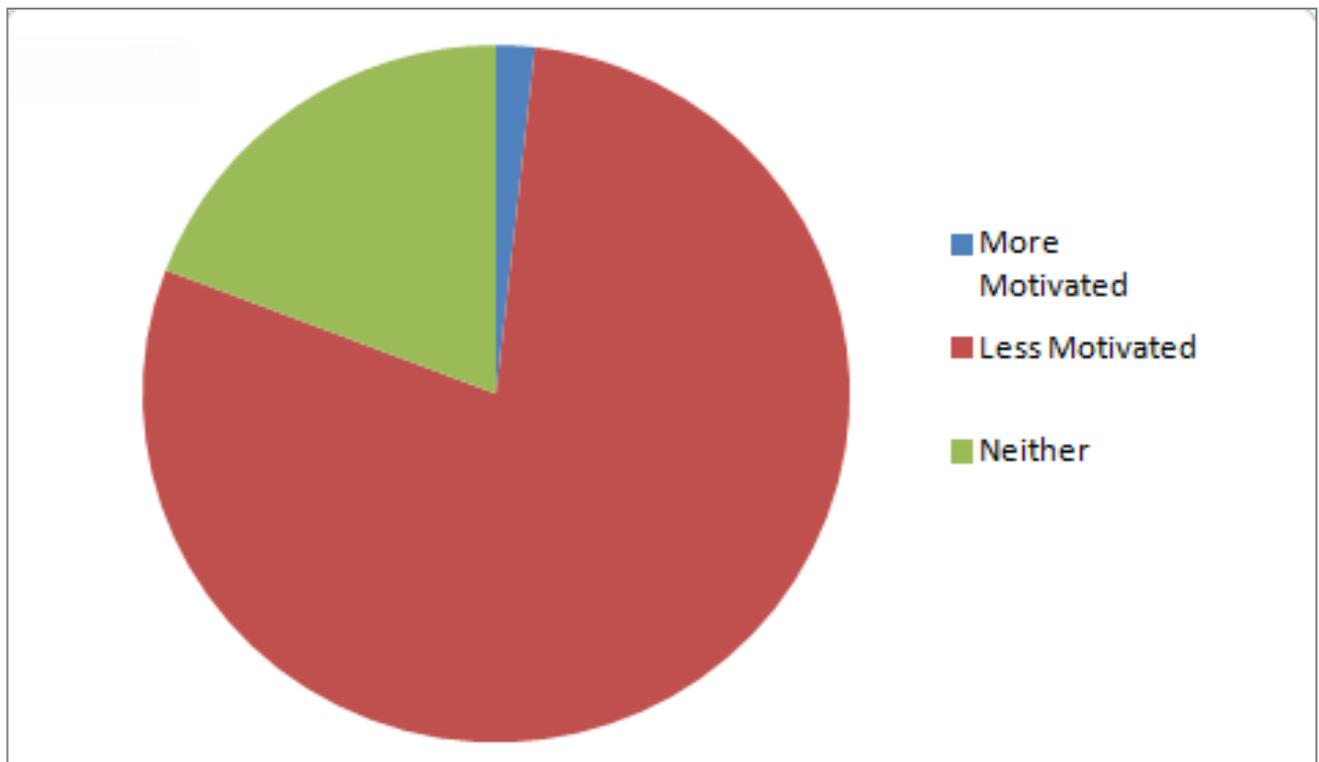

Figure 1. Percentage of students' motivation in online compared with face to face classes
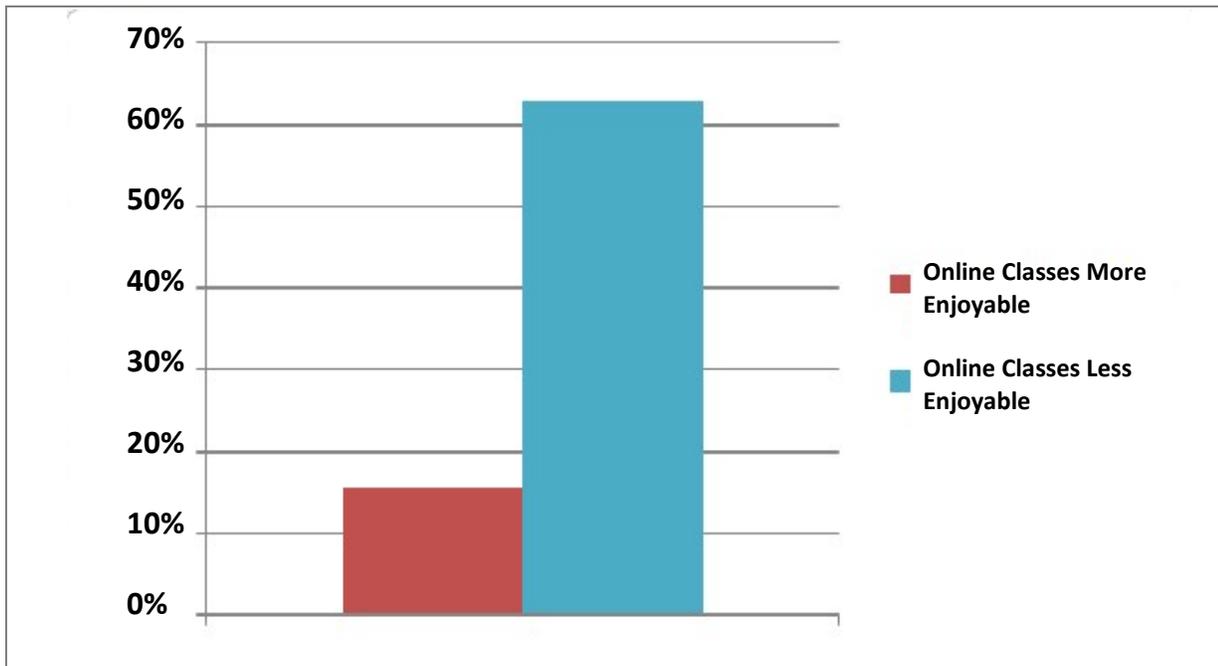
Figure 2. Percentage of students' enjoyment

an online class to be less enjoyable than taking a traditional class. (See Figure 2).

The results of the present online course survey suggest some of the factors that may cause students' motivation to decrease when they are enrolled in online classes through Blackboard. Two factors are the students' expectation of a reasonable workload and their perceptions about a clear course structure. Students indicated they had a difficult time navigating the requirements for the classes, adding to the already substantial workload required by the classes. Both of these issues are avoidable and can be corrected.

The survey results were mixed when students were asked about their overall learning satisfaction toward the online courses. Thirty-three percent of the students reported that they were satisfied, 38.5 % reported being unsatisfied, and 28% of the respondents indicated that they were neither satisfied nor unsatisfied. Making changes to how students take online classes may lead to an increase in the overall level of student motivation. (See Figure 3).

Learning Style

In this section is examined the gap between the perceived learning needs of online students and the instructional resources currently available. The pattern of responses to the question, "Does Blackboard meet the needs of students with diverse learning needs?" is complicated. The results of the survey indicated students' learning preferences did not significantly affect student satisfaction. Students acknowledged that Blackboard courses were heavily biased toward text-

based instruction; however, the majority of students were comfortable with that medium, even though it was not their preferred learning style. The majority of students felt that, despite a lack of variety in the content on Blackboard, their needs for learning were adequately addressed by the current form of Blackboard at the university.

When asked about their learning preferences, a large majority of students identified themselves as having visual and kinesthetic learning styles. In response to the question, "What type of learning style are you most comfortable with," the visual learning style was identified 39% of the time, kinesthetic learning was selected 31% of the time, auditory learning was chosen 18% of the time, and read/write learning was chosen only 12% of the time. The read/write learning style was only chosen approximately 1 out of every ten times, making it the least popular learning style by a large margin.

Consistent with findings in the literature review, the students identified read/write as the learning style that dominates course content on Blackboard. When asked, "Based on your experiences, which learning styles are most commonly addressed in Blackboard," the read/write category was selected 52% of the time, visual was picked 35% of the time, auditory was identified 16% of the time, and kinesthetic was chosen just 3% of the time. This represents a large gap between student preferences and how the content is typically delivered. It would seem to follow that students might be deeply dissatisfied with the instructional materials used on Blackboard; however, our research indicates
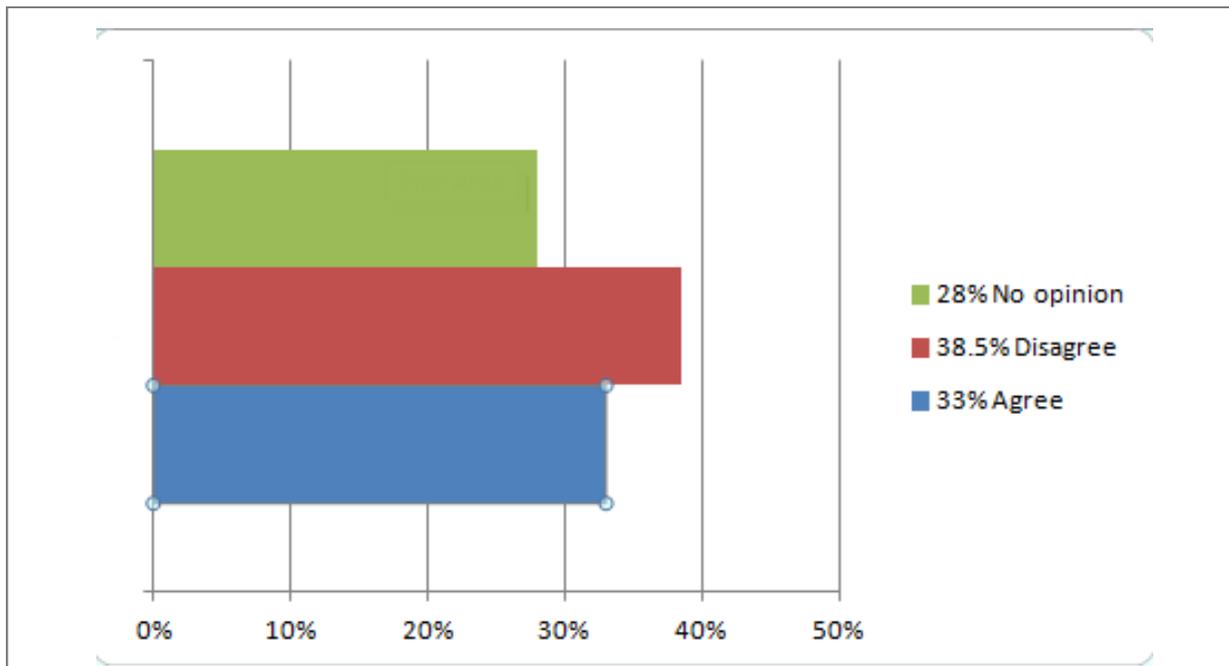
Figure 3. Percentage of overall students' satisfaction

this was not the case.

One of the most puzzling results of the survey was the relatively positive student assessment of Blackboard in relationship to learning styles. Of the students surveyed, 64% agreed that, "Blackboard adequately facilitates learning in the style that is most effective for me." Only 5% disagreed and no one disagreed strongly. This is an interesting paradox. Why would a group of students who largely identify themselves as visual and kinesthetic learners report that their learning needs are being met by courses that are heavily biased toward the read/write learning style? One possible explanation is that online students have different learning needs than do traditional students.

In their research, Drago and Wagner (2004) speculated that, based on the learning profiles they compiled of online students, those who have the option of choosing between traditional and online classes may choose based on their learning preferences. While few students in our survey chose the read/write learning style as their preference, their answers indicated that they were very comfortable with learning from text-based instructional materials. Students who were uncomfortable with the read/write learning style would be less likely to take an online course. (In order to more fully assess this question it would be necessary to survey students who have opted out of the online course work and determine their motivation.) In addition, Diaz and Cartnal (1999) reported that students who enroll in online classes were not as "dependent" on their learning style to be able to learn, (as cited in Drago and Wagner, 2004). This could explain why students, who clearly

preferred visual and kinesthetic learning, reported that Blackboard met their learning needs. It is possible that these students are better able than are traditional students to learn from materials that do not match their preferred learning style.

A commonly cited reason for taking online classes is the convenience of the flexible schedule and the ability to work from home. Students may expect to make some trade-offs for these benefits, such as doing work that involves more reading and writing. This would mean that while students may not enjoy or prefer to learn in the read/write style, they accept it as the price of taking online classes.

The survey results indicate that while Blackboard courses are delivered in a way that heavily favors the "read/write" learning style, the platform is meeting student needs and expectations. Based on the survey answers and a review of the literature it is proposed that this is probably because of the type of student who takes online classes. As the number of students who take online classes continues to increase, it is likely that online classes will attract students with more heterogeneous learning needs, that is, learners who will require more diverse learning materials in order to be successful. It also likely that as learning materials improve, student expectations will rise accordingly, and they may no longer find classes dominated by reading and writing to be acceptable. Therefore, despite current student satisfaction with the way Blackboard addresses learning styles, diversifying the types of learning materials used is likely to become increasingly important.

Course Structure

Regarding course structure, including objectives and infrastructure, student were asked to respond to six questions about how they think of course structure in terms of adequate flexibility and consistent follow-up throughout an online course. Overall, students were satisfied with the online course structures provided by their instructors, with a mean score of 3.37 out of 5.00. In addition, the median and mode of course structure were 3.50 and 4.00 respectively. This shows that a majority of students were inclined to rate course structure as satisfactory in their online classes. However, student satisfaction with course structure in online education may not be the best way to determine the quality of course structure. In this study, the mean score on the question asking students' overall satisfaction of their online courses in Blackboard was 2.98, which is below the mean of all six questions about course structure, which was at 3.38. In addition, the difference was a margin of only two participants between positive responses (29) and negative answers (27) from the mean value, 3.37. (See Figure 4).

As shown in Figure 4, results on only two questions yielded a mean score below the total mean on course structure, and on the rest of the four questions the mean scores were more positive than was the total mean regarding course objectives and infrastructure. For the question about the overall satisfaction with the online course structure (Figure 5), 18 (32.15%) students responded that they were not satisfied with the overall online course structure. On the other hand, 20 (35.7%) students answered that the flexibility and consistent follow-up of online courses were satisfactory. The remaining 18 participants were neutral in their stances toward online course structure in Blackboard, representing 32.15% of the 56 survey participants.

Furthermore, on the other questions regarding accessibility, feedback easily found, consistent feedback, and course materials, participants responded positively, yielding mean scores at 3.66, 3.50, 3.48, and 3.71 respectively, all of which are above the mean score on the online course structure, 3.37. These mean values can be interpreted to indicate that students were satisfied with the accessibility of online courses, feedback from instructors, and course materials.

The final question related to course structure asked students about the level of reflection of students' needs in the online course structure. In Figure 6 it can
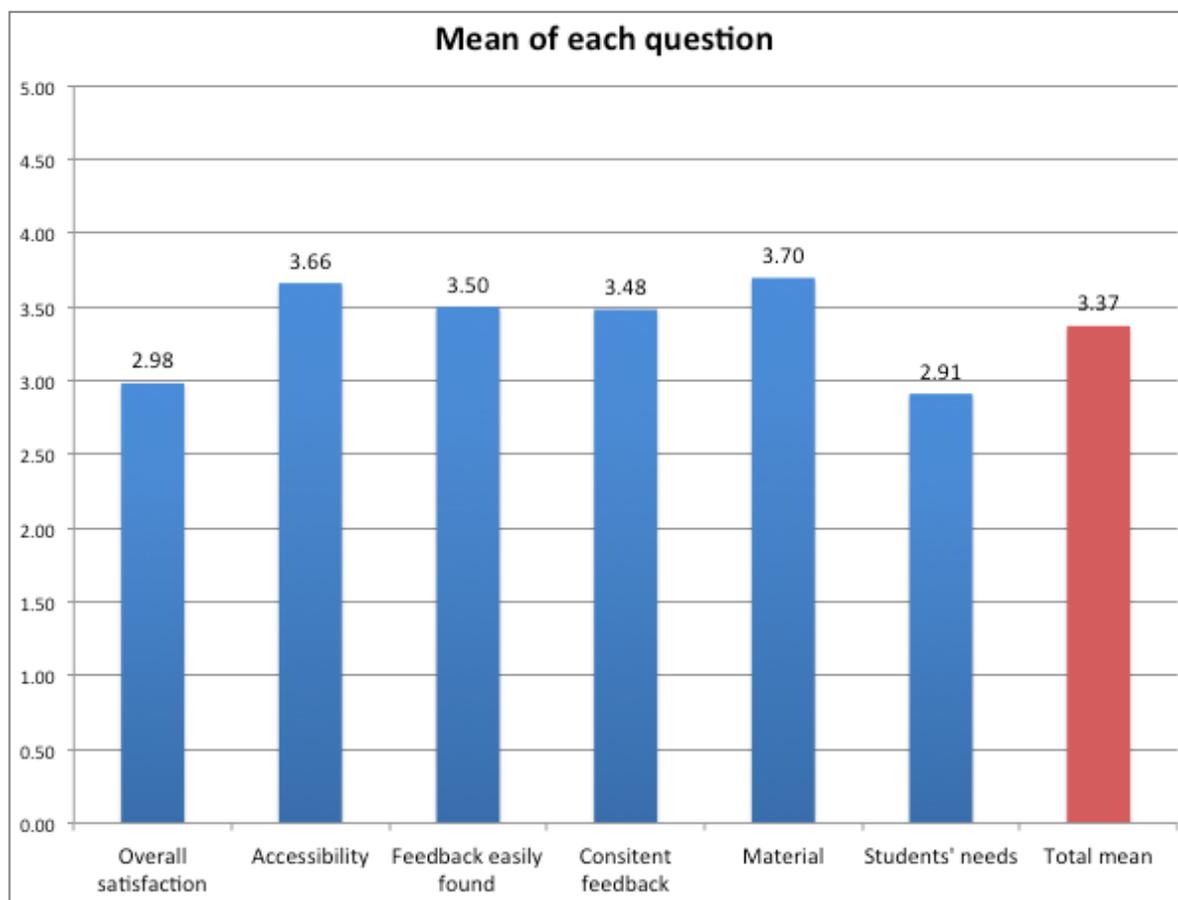

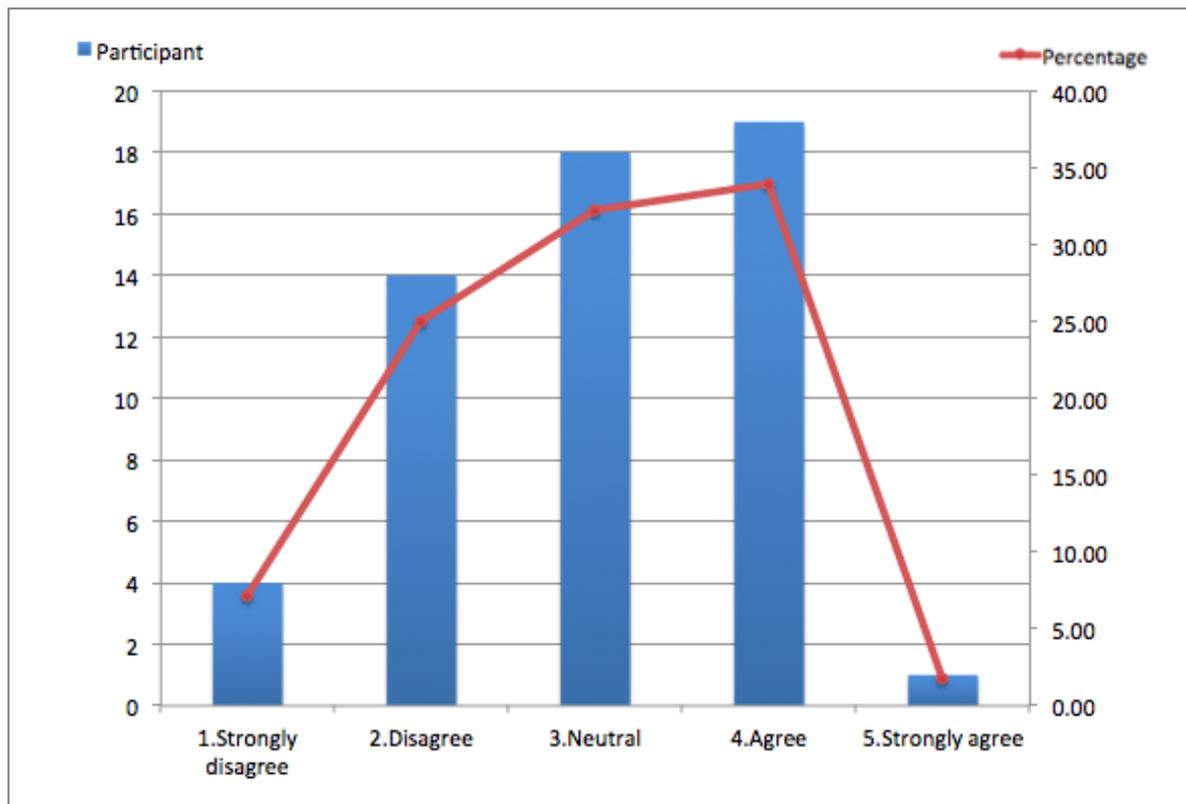*Figure 4.* Mean scores on course structure questions

Figure 5. Participants and percentage about overall satisfaction

be seen that students' showed the highest rate of dissatisfaction with this question, with a mean value of 2.91, within the context of the six questions concerning the online course structure. Specifically, 21 students (37.5%) responded that they were not satisfied with the reflection of students' needs in the course structures. On the contrary, 19 participants (33.9%) answered that students' feedback and comments on the online course structure were well reflected by instructors or online education experts. The rest of the 16 students were neutral in their stances toward reflecting students' needs in the online course structure, representing 28.6% of the 56 survey participants.

To sum up the results of students' attitudes toward online course structure, students were satisfied with the overall online course structure, with a total mean score of 3.37 out of 5. However, some questions about course structure indicated students' dissatisfaction in the reflection of students' needs into the course structure. This result can be interpreted to mean that online course structure does not significantly affect the students' overall satisfaction of online education systems. This finding supports those of Eom, Wen, and Ashill's (2006) that what matters more as a measure of the quality of learning activities were other learning factors, such as active interaction and timely and sincere feedback, rather than the ease of use of the online course structure.

Interaction

The purpose of this research was to measure the gap between the current state of online classes in Blackboard and the needs of undergraduate students enrolled in online courses, and to recommend possible improvements to Blackboard and online systems at the university. The students' responses regarding interaction yielded interesting results. The interaction questions were grouped into three categories: student-to-instructor, student-to-student, and student-to-content. Not only did the questions reveal the level of student dissatisfaction/satisfaction, but also what interaction tools they used most, and found most valuable.

In the student-to-instructor category, the mean score for all questions ranged from 3.23 to 3.76, with a score of 3 representing neutrality, 1 as Strongly Dissatisfied and 5 Strongly Satisfied. Of note was that there were very few instances of a response of "Strongly Disagree" to any of these questions, suggesting that only a small minority of students were extremely dissatisfied with their instructor interaction. At the other end of the spectrum, there was a multitude of "Strongly Agree" responses to student-to-teacher interaction. Of those that responded that they were satisfied, the types of interactions that they reported using indicated that over 84% relied on email. Nearly six percent used collaboration, and only a small percentage, four percent, used the phone or texting.
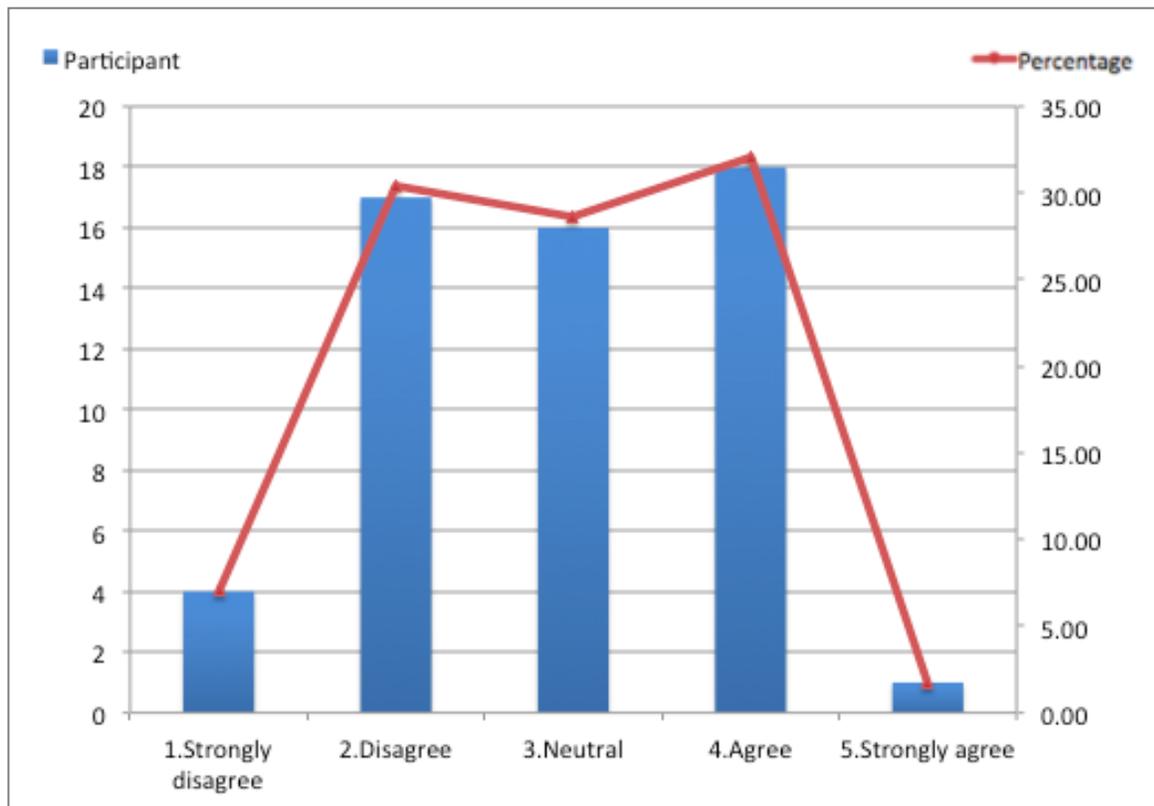
Figure 6. Participants and percentage about students' needs reflected in course

These results somewhat conflict with those of Landry, Griffeth, and Hartman (2006), who reported that students viewed course content tools to be more useful than interaction tools like email. In the current study, for those respondents that were not generally satisfied with their instructor interactions, what they reported needing more of was as follows: Email 20.29%, Phone 11.59%, Texting 10.14%, Social Networking. 11.59%, Chat 21.74%, Video 13.04% and Blogs at 4.35%. The request for more instructor interaction via Social Networking (12%) plus Chat (22%) could be satisfied by the implementation of Blackboard Sync™ (Blackboard, 2008).

Looking at the student-to-student interaction data, there appears to be a higher reported level of dissatisfaction. Specific survey questions asked about satisfaction with the overall interactions with my classmates, interaction and/or communication of more than three times a week with classmates, more communications than in a face-to-face class, and overall student-to-student interaction tool satisfaction. Overall, classmate interaction revealed a mean score of 3.2, just slightly higher than neutral, with the mode at 4.0. When asked about interactions of more than 3 times a week, students responded quite unfavorably, with the mean at 2.0, Disagree, with the mode at 1.0, Strongly Disagree. What this reveals is that overall student interaction is low in this Blackboard environment. As a result,

collaboration may be being compromised. Respondents also reported disagreement with having more interactions in the online Blackboard environment than in a face-to-face class, with the mean at 1.64, and the mode at 1.0. What is extremely noteworthy is the response to overall satisfaction with student-to-student interaction tools. The mean score on this item was 4.8 (Strongly Agree), and the mode was 4.0. These results reveal that students are not interacting (or at least as much as they would in a face-to-face class), but that they are reporting very high satisfaction with the tools available. The open-ended questions showed what tools satisfied students are using: Email 37.82%, Texting, 16.81%, Phone 12.61%, Social Networking 5.88%, Chat 5.04% and Blogs at 3.36%. Dissatisfied students reported needing more Email 19.2%, Chat 16.18%, Video 14.71%, Phone and Social Networking 11.76%, Texting 8.82% and Blogs 5.88%. Email appears to be the tool used most and indicated as most desirable by these students for student-to-student interaction. In regard to dissatisfied students, we may speculate that this is an individual learner problem and not a problem with Blackboard, because the tool depends on the student initiating its use.

The last category of interaction was student-to-content interaction. The survey questions asked the degree to which students were satisfied with the content, used the content at least three times a week,

and if the content facilitated their learning more than in a face-to face class. The data showed that most were satisfied, with a mean score of 3.12, and a mode of 4.0. Responses to the question about interactions with the content of at least three times a week revealed a mean of 2.69 and a mode of 4.0. The most dissatisfaction occurred when comparing the online course to a face-to-face class. The mean response to this question was 2.23, with a mode of 2.0. Most disagreed that the online course was a better facilitator of learning. For those satisfied with student-to-content interactions, students reported utilizing: Attachments 31.18%, Sharing 21.51%, Importing 10.75%, Embedded 7.53, Conversion 4.30% and Blogging 3.3%. For dis-satisfied students, the data revealed that they wanted more Sharing 22.08%, Collaboration 18.18%, Social Networking 14.29%, Blogging 12.99%, Conversion 10.39%, Attachments and Embedded 7.79% and Importing 6.49%. The implementation of Blackboard Sync™ (Blackboard, 2008) again would satisfy most of the students' concerns in this area.

Based on these interaction results, some of the conflicts between student dissatisfaction and needs may be due to the effects of the Technology Acceptance Model (Landry, Griffeth, and Hartman, 2006). This model, created by Fred Davis in 1989 (cited in Landry, Griffeth, and Hartman, 2006), states that a person's attitudes and perceptions towards technology can affect his or her behavior. If Blackboard student users do not perceive the interaction technology as "useful" or "easy", then they may not utilize it. Perceived ease of use is defined by Davis (1989) as "the degree to which a person believes that using a particular technology would be free from effort" (cited in Landry, Griffeth, and Hartman, 2006, p. 88). The fact that the data in the current study reveal that dissatisfied students want more interaction with tools that already exist, may support this model.

One of the professors interviewed for this research study proposed that a simple solution to close this performance gap would be to offer an introductory course on how to use the interaction tools in Blackboard and what the level of expected student interaction is. Stating that students should have at least one instructor interaction every two weeks, five student-to-student interactions each week and interact with Blackboard content at least three times a week would also provide some framework for acceptable interaction levels. Exposing students to the chat room, virtual classrooms, group tools, etc., would familiarize them with each tool type and provide them with experience about what each tool can do. In essence, these measures could change their perceptions of the online class environment.

Instructor Interviews

Two online instructors who use Blackboard at the university, and who taught the courses in which the student respondents were enrolled, were interviewed. Both were well-seasoned instructors in Blackboard, with a combined total of over 60 semesters of instructing online in this environment. The interviews revealed that one of the biggest challenges for instructors was reading and assessing the discussion boards. They described this process as "cumbersome", and the grade book as "challenging". Also, these instructors would like better and easier ways to interact with students. One interviewee expressed her desire to develop an introductory video for the first week of class, especially due to the number of non-native English students enrolled. She also noted that courses in Blackboard are too heavily text-based and that she wanted to see more incorporation and utilization of visuals, reducing cognitive load, not only for the student, but for the instructor as well. (See Appendix B for complete results.)

Conclusion and Recommendations

Clark and Estes (2008) propose that there are only three kinds of organizational performance gaps, that is: gaps related to skills, gaps related to motivation, and gaps related to organizational conditions. They also assert that there are only three solutions to organizational performance gaps, improving skills, motivation, and organizational conditions. The purpose of this study was to analyze the performance gaps between the needs of students enrolled in online classes at one major western university and the current resources available in Blackboard to them. We evaluated the performance gaps related to meeting students' needs in four areas: motivation, learning styles, course structure, and interaction. In this section we will discuss our recommendations based on the literature review and our analysis of the study's findings.

It was determined that there is a skills gap related to student competence in using Blackboard to interact online. There is evidence that this gap is related to the Technology Acceptance Model (Davis, 1989, cited in Landry, Griffeth, & Hartman, 2006), because the tools needed to close this gap already exist. We recommend a week-long introductory course to familiarize students with the tools available in Blackboard and facilitate their uses for interaction. This short course would provide students the skills they need to interact more effectively through Blackboard.

Results of this study revealed that many students view online classes to be less important than face-to-

face classes. This attitude creates a motivation gap, because students who do not perceive online classes as important may not be motivated to produce quality work. The best way to improve the image of online education is to improve online education; each positive student experience, and each quality online graduate will build the brand of online education. That is the overarching goal of this paper and the other discussions and recommendations reported here will be part of that process.

Many students feel that the workload for online courses is greater than for comparable face-to-face classes. The disproportionate workload is an organizational condition performance gap that appears to create a motivational performance gap. Research by Kim and Frick (2011) has demonstrated that excessive workloads depress student motivation. We recommend that the workload for each online class be evaluated in terms of the actual amount of time required to do the work and that the workload be consistent with the credit hours received for the class, as well as with comparable face-to-face classes. Addressing this on an organizational level should address it on a motivational level as well.

Another organizational condition performance gap that results in a motivational gap is the course organization. Many students were frustrated by the amount of time consumed navigating the system to obtain basic course information. Time spent navigating the system added to the workload of students who already felt overworked. We recommend that the format of online classes at the university be standardized as much as possible. A consistent format would increase the student ease of use, reduce time spent navigating the system, and reduce student frustration. Again addressing this gap on an organizational level should close it on the motivational level.

With regard to learning styles, it was determined that Blackboard is meeting the needs of the current students enrolled in online classes at this university. However, it is recommended that, as the scope of online education expands and more diverse learners enroll in online classes, instructional materials should likewise expand in terms of accommodating student needs.

In relation to course structure, it was found that improvements to the organization and usability of Blackboard could be made to increase student achievement. However, the research indicated that the most important criteria for a successful online experience were active interaction and feedback from the instructor.

In conclusion, we have analyzed the performance of online courses using Blackboard at one major university, and identified significant gaps related to student skills, and the efficiency of user interactions. We have made recommendations to address these gaps on the skills, motivation, and organizational level. As online education continues to grow in scope and importance we hope these recommendations will be of use to those who develop online learning courses and materials at this university and others.

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1. Motivation

These questions below ask you about what you think of learning motivation in Blackboard.

(SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree)

Questions	Rating Scale	1. SD	2. D	3. N	4. A	5. SA
1. I am satisfied with the overall learning motivation of the online courses in Blackboard.						
2. I am more motivated in the online course than in the face-to-face class.						
3. It is harder to get assignments done on time in the online course than in the face-to-face class.						
4. I find the online course just as enjoyable as the face-to-face class.						
5. The online course seems less important than the face-to-face class.						
6. I find it easier to keep on top of the online course than the face-to-face class.						
7. I find it difficult participating in the online course.						

2. Learning style

These questions below ask you about what you think of the reflection of students' learning style in Blackboard.

(SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree)

Rating Scale Questions	1. SD	2. D	3. N	4. A	5. SA
1. I am satisfied with the reflection of the overall learning styles in the online courses of Blackboard.					
2. The online courses in Blackboard meet the needs of students with different learning styles.					
3. What type of the learning styles are you most comfortable with? Visual ____; Auditory ____; Read/Write ____; Kinesthetic ____; Others (_____) * *Kinesthetic: Kinesthetic learners learn best by doing. They are often high energy and like to make use of touching, moving and interacting with their environment.*					
4. Based on your experiences, which learning styles are most commonly addressed in the online courses in Blackboard? Visual ____; Auditory ____; Read/Write ____; Kinesthetic ____; Others (_____)					
5. The online courses in Blackboard favor particular learning styles.					
5-1. **If 4 (A) or 5 (SA) are chosen**, which learning styles are they? Visual ____; Auditory ____; Read/Write ____; Kinesthetic ____; Others (_____)					
6. The online courses in Blackboard do an adequate job of presenting instructions in a visual way.					
7. The online courses in Blackboard do an adequate job of presenting instructions in an auditory way.					
8. The online courses in Blackboard present adequate written instructions.					
9. The online courses in Blackboard are good media for kinesthetic learning style.					
10. The online courses in Blackboard adequately facilitate me in the learning style that is the most effective for me.					
11. My experiences in the online courses in Blackboard include a variety of instructional media that fit my learning style.					

3. Course Structure

These questions below ask you about what you think of the online course structure of Blackboard regarding their objectives, organization, and materials.

(SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree)

Questions Rating Scale	1. SD	2. D	3. N	4. A	5. SA
1. I am satisfied with the overall online course structure.					
2. The objectives of the online course are easily accessible.					
3. The instructor's feedback is easy to find.					
4. The feedback given in a consistent format and location.					
5. The course materials are well organized and delivered.					
6. The structure of the online course adequately reflects students' diversity and needs.					
7. What improvements do you think the online course structure is needed in terms of their objectives, organization, and materials?					

4. Interaction

These questions below ask you of how you feel about interactions among students, instructors, and content made and incorporated in online courses.

(SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree)

<Student to Instructor>

Rating Scale Questions	1. SD	2. D	3. N	4. A	5. SA
1. I am satisfied with the overall interactions with the instructor throughout the online course.					
2. I have received adequate feedback from the instructor.					
3. I am satisfied with the response time for the instructor feedback that I have received.					
4. I am satisfied with communications with my instructor regarding assignments, exams, and due dates.					
5. I am satisfied with the types of the interaction with the instructor.					

5-1. **If 3 (N), 4 (A), or 5 (SA) are chosen**, what interactions with the instructor do you have in the online

    course?

    Email __; Phone __; Texting __; Social Networking __; if checked (_____)

    Online Chat __; Video Conference __; Blog __; Collaborating work __

    * If checked, the checked items are positive to be used as a means of interactions between instructors and students throughout online course.

5-2. **If 1 (SD) or 2 (D) are chosen**, what interactions with the instructor do you need more in the online course?

    Email __; Phone __; Texting __; Social Networking __; if checked (_____)

    Online Chat __; Video Conference __; Blog __; Collaborating work __

    * If checked, the checked items are what students want to have more as a means of interactions between instructors and students throughout online course.

<Student to Student>

Questions Rating Scale	1. SD	2. D	3. N	4. A	5. SA
1. I am satisfied with the overall interactions with my classmates throughout the online course.					
2. I interact with my classmates in the online course at least three times a week.					
3. I communicate with my classmates in the online course more than in the face-to-face class.					
4. I am satisfied with the student interaction tools provided in the online course.					

4-1. **If 3 (N), 4 (A), or 5 (SA) are chosen**, what interactions with the classmates do you have in the online

    course?

  Email __; Phone __; Texting __; Social Networking __; if checked (_____)

  Online Chat __; Video Conference __; Blog __; Collaborating work __

   * If checked, the checked items are positive to be used as a means of interactions among students throughout online course.

4-2. **If 1 (SD) or 2 (D) are chosen**, what interactions with the classmates do you need more in the online

    course?

  Email __; Phone __; Texting __; Social Networking __; if checked (_____)

  Online Chat __; Video Conference __; Blog __; Collaborating work __

   * If checked, the checked items are what students want to have more as a means of interactions among students throughout online course.

<Student to Content>

Questions	Rating Scale	1. SD	2. D	3. N	4. A	5. SA
1. I am satisfied with the overall interactions with the course content throughout the online course.						
2. I use the content/context in the online course at least three times a week.						
3. The interactions with the content in the online course more facilitate my learning more than in the face-to-face class.						
4. I am satisfied with the interactions of the content/context in the online course.						

4-1. **If 3 (N), 4 (A), or 5 (SA) are chosen**, what interactions with content or context do you have in the online

   course?

   Attachment __; Embedding __; Sharing __; Importing/Exporting __;

   Converting __; Blogging __; Collaborating __; Social Networking __

   * *If checked, the checked items are positive to be used as a means of interactions between students and content throughout online course.*

4-2. **If 1 (SD) or 2 (D) are chosen**, what interactions with content or context do you need more in the online

   course?

   Attachment __; Embedding __; Sharing __; Importing/Exporting __;

   Converting __; Blogging __; Collaborating __; Social Networking __

   * *If checked, the checked items are what students want to have more as a means of interactions between students and content throughout online course.*

Instructor A, University of Northern Colorado
Professor of Educational Technology
Interview Date 11/8/11
Interviewer: 1

Instructor

How many online courses do you teach in a semester, on average?

    2

How long (semesters) have you been using Blackboard for your instructional method?

    10 years, about 30 semesters, Fall, Spring and Summer

What difficulties have you experienced using Blackboard as a course management system?

    How disjointed things are.

What do your online students want more from you as an online instructor and from online education environments in UNC?

    Things are a layer or two away. It is hard to get a message across. Short term memory as there are too many steps (clicks). STM is compromised. There is also little to no imagery used.

What improvements can be made for more satisfactory online teaching experiences?

    There should be an easier way to video tape yourself or a lesson. The international students have a better time with verbal on video rather than just text in Blackboard. They handle a course introduction better via a taped introduction. It should be more engaging. They did add feedback to new blackboard version, but it needs to be more pronounced to the student. Some don't know when you give them feedback. Too much cognitive overload in general.

Instructor B, University of Northern Colorado, Associate Professor, Educational Technology and Social Foundations

Interview Date 11/15/11
Interviewer: 1

Instructor

How many online courses do you teach in a semester, on average?

    Too many. 1 or 2 by myself, but 4 additional with GA assistants

How long (semesters) have you been using Blackboard for your instructional method?

    Since 1999, about 11 years * 3 about 33 semesters

What difficulties have you experienced using Blackboard as a course management system?

    Biggest challenges reading and assessing the discussion board, it is cumbersome. Also, the gradebook is a challenge but it mostly works. More students glitch with the timed release repercussions of assignments and exams. Duplicate questions from the students. The same question(s) get asked over and over.

What do your online students want more from you as an online instructor and from online education environments in UNC?

    Based on teacher evaluations, clear directions and more feedback.

What improvements can be made for more satisfactory online teaching experiences?

    Better ways to interact. There should be less complicated and easier ways to interact with each other (student to teacher, and student to student).

<center>**Blackboard Expert Interview with Online Expert**</center>

Note: University A is the current university; University B is referred to by the expert, as another university with which he has experience

Q1. What kinds of requests from faculty members and students

A1.

Blackboard technical support department mostly get some requests of improvement from faculty members and students such as browser compatibility, upgrade timeline, technical issues, training items, and so on.

Based on faculty survey results (from the 2009 Faculty Task Force Review), faculty members are mostly concerned about issues below.

The inefficiency of the grade book

Lack of Printed Manuals/Classes Inconvenient/More information on advanced tools/Tip Sheets

Provide more detailed training for new faculty the week before classes

Concern about how System Announcements override instructor announcements

Blackboard doesn't integrate well with newer applications (Facebook, twitter) or allow outside applications (simulations etc.) or have the ability to show videos that are shown in class

More personal communication, not just emails from "LMS team"

Supported browsers issues

Q2. Differences between Blackboard at University A and others

A2.

The main differences between Blackboard at **University A** and other LMS like Canvas will be interface and social integration. That is, Blackboard at **University A** mostly uses traditional modules such as course sites. On the other hand, other LMSs such as Canvas has more social-friendly interfaces that Blackboard at **University A** right now doesn't have.

Q3. Improvements on Blackboard at University A that can be made

A3.

Blackboard technical support has been continuously trying to improve Blackboard services and supports in ways that Blackboard should be well functional, reliable, and stable. In addition to that, one more aspect of Blackboard to be taken into account as an improvement may be socially enhanced and integrated features including inserting social networking services, easy sharing, and efficient communications among instructors, students, and content.

Q4. Thoughts on transferring Blackboard into Canvas of LMS of University B

A4.

Since Canvas is a newer LMS found in 2008 than Blackboard, transferring into Canvas is a great opportunity for **University B** to make their LMS improved and socially enhanced. Other universities were most likely reviewing newer LMS' and had different criterion and rational for the selection of one LMS over another. I have not yet had the opportunity to review Canvas and could only suggest that the last time a review was completed at **University A**, that Canvas was not an available option.

University A has been gradually upgrading its LMS, Blackboard, in various ways that faculty members and students are satisfied with including increasing functionality, reliability, and stability of Blackboard by supporting items and administering trainings. Our team of instructional designers and information technology continues to learn about and

evaluate our current LMS and alternative LMS' to ensure that we address the changing needs and expectations of the campus community.

Q5. Future plans for LMS at University A

A5.

Right now, **University A** doesn't have a major change of its LMS, Blackboard, but has a upgrade schedule of Blackboard within a month or so. Blackboard version 9.1 provides a number of enhancements which we had discussed could be found within the context of the website. The specifics the IDIT (Instructional Design and Information Technology) group provided are included here:

New Features: Blackboard 9.1 includes the following new features that will be beneficial for UNC faculty and students:

- Wikis

- Graded Blogs, Wikis, Journals

- Audio and Visual content integration (direct link to YouTube to insert video)

- Advanced Accessibility Features (Gold Level certified by National Federation for the Blind)

- File Management (streamline upload of revised course documents)

- Direct link from control panel to items that Need Grading.

- Learning Modules and Lesson Plans

In terms of socially enhanced LMS like Canvas an evaluation conducted by Faculty, Staff and Students of all LMS options would need to be conducted to identify an appropriate LMS solution for our LMS. However, **University A** definitely benchmarks best practices of LMS from other organizations in order to reflect current trends of LMS to its LMS, Blackboard, for providing faculty members and students with better functionality, reliability, and stability of LMS.