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Using the Voice of the Student to Evaluate Learning Management Systems

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Dr. Elizabeth Cudney is an Associate Professor in the Engineering Management and Systems Engineering Department at Missouri University of Science and Technology. She received her B.S. in Industrial Engineering from North Carolina State University, Master of Engineering in Mechanical Engineering and Master of Business Administration from the University of Hartford, and her doctorate in Engineering Management from the University of Missouri – Rolla. In 2013, Dr. Cudney was elected as an ASQ Fellow. In 2010, Dr. Cudney was inducted into the International Academy for Quality. She received the 2008 ASQ A.V. Feigenbaum Medal and the 2006 SME Outstanding Young Manufacturing Engineering Award. She has published four books and over 40 journal papers. She is an ASQ Certified Quality Engineer, Manager of Quality/Operational Excellence, and Certified Six Sigma Black Belt. She is a member of the ASEE, ASEM, ASQ, IIE, and the Japan Quality Engineering Society (JQES).

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Miss Katie M. Kaczmarek, Missouri University of Science & Technology

I am a student at Missouri University of Science and Technology where I am earning a Bachelor's of Science in Engineering Management. I have work experience in Project Management and Lean Six Sigma. I am also Six Sigma Green Belt Certified.

Bonnie Wilt, Missouri University of Science & Technology

Bonnie Wilt is an undergraduate student in the Engineering Management department at Missouri University of Science and Technology. She will graduate with honors in December 2016.

Kamaria Blaney, Missouri University of Science & Technology

I am an Engineering Management student emphasizing in Industrial Engineering and minoring in marketing. Capturing the voice of the student was a blast & worth all the feedback we received.

Ms. Julie Phelps, Missouri University of Science & Technology

Julie Phelps has been an instructional designer at Missouri University of Science and Technology since 2010. She supports faculty in the effective use of technology in the classroom as well as blended/online course development. She holds an M.A. in Information and Learning Technologies from The University of Colorado-Denver and a B.S. Ed. from The University of Missouri, Columbia.

From 2001-2010, Julie was an instructional specialist for the eMINTS National Center providing professional development to K-12 teachers throughout Missouri. Prior to eMINTS, Julie taught elementary grades in Missouri, Texas, and Colorado over a span of 17 years.

Using the Voice of the Student to Evaluate Learning Management Systems

Abstract

A learning management system is an educational tool employed in higher education to organize, document, track, report, and deliver courses. Selecting the appropriate learning management system is a critical decision for a university. This study explores the usability of two leading systems, Blackboard and Canvas, from the students' perspective. The goal is to gather and analyze user preferences in order to select an appropriate learning management system. Data was collected through surveys of student's experience with the two learning management systems. The survey evaluated the ease of the following tasks: finding course documents, viewing grades, ease of navigation, intuitiveness, and communicating with professors. A usability study was also conducted on both learning management systems. The information was combined to provide an overall ranking of the learning management systems.

Keywords: Learning Management System, Voice of the Student, Canvas, Blackboard

Introduction

At the time of this study, Missouri University of Science and Technology (S&T) was using two different learning management systems (LMS) to organize administration, documentation, tracking, reporting, and delivery of students' academic information (Lonn and Teasley, 2009). Blackboard is the existing LMS in use; however, Canvas is currently undergoing a trial on campus. Three students in undergraduate courses on Quality and Human Factors worked with their course instructors and members of the campus educational technology department to evaluate the two learning management systems. This project was part of their undergraduate research. The goal of the research was to collect user data, analyze performance, and develop conclusions regarding the two LMS for the campus. Based on the analysis, recommendations were made for an LMS after the comparison period, which lasted two years.

LMS have been defined as an avenue for classroom materials to be easily shared between instructors and students. It enables interactions outside the classroom (Adzharuddin and Ling, 2013). Research by Phelps and Michea (2003) showed that most of the evaluations of LMS focused on the evaluation of the technology, not on the educational outcome. Many interactive features available in LMS have been used limitedly because of time and effort required by instructors and students (Almarashdeh, Noraidah, Nor Azan, and Alsmadi, 2010). Mtebe (2015) suggests strategies that can help institutions make more effective use of their LMS. This undergraduate research focused on the usability of two LMS.

Research Methodology

To compare the performance of two LMS, Canvas and Blackboard, it was important for the evaluation to occur in the same setting. For the campus involved, Blackboard was the original LMS; therefore, the majority of students were most familiar with this LMS. Canvas was used in a very extensive evaluation study over a two-year period in select classes. The undergraduate course on Quality was part of the evaluation study.

There were three different sources of data for the project. In the fall of 2015, a survey was sent out to the university student community and approximately 700 usable responses were obtained. This study was conducted by the university's educational technology department. Another survey was conducted in the spring of 2016 that focused on students' preferences for Blackboard or Canvas as part of the undergraduate research effort, which resulted in 137 responses. In addition, a usability study was conducted to gain qualitative usability data. Among other questions, the student preference survey asked students to rank the two systems for the following tasks:

1. Finding course documents
2. Finding grades
3. Having accurate and updated grades
4. Ease of navigation
5. Intuitiveness
6. Communicating with professors

Volunteers were recruited from the 2016 online survey for a usability study. During the study, students performed a set of five tasks in both Blackboard and Canvas. Each task was timed and the number of clicks to complete each task was recorded. The tasks performed were:

1. Download a syllabus
2. Find an assignment
3. Find an assignment submission
4. Look up a grade
5. Logout

Data Analysis

The first portion of the survey asked students to rate how well user expectations were met by each LMS on a scale from 1-5. Table 1 provides the average ratings from students for Blackboard and Canvas. Through the data, it was observed that users preferred Canvas to Blackboard (overall average of 3.23).

Table 1: Student Scores for Meeting User Expectations

	Finding Course Documents	Finding Grades	Having accurate and updated grades	Ease of Navigation	Intuitiveness	Communicating issues with professor
Blackboard Average	3.73	3.71	3.05	3.28	3.05	2.54
Canvas Average	3.85	4.00	3.67	3.80	3.65	3.61

The results show that 83 out of the 137 survey respondents (61%) preferred Canvas to Blackboard. Further, the average ratings for meeting student expectations was higher for Canvas. When asked why they preferred a certain LMS to the other, 72% of users that preferred Blackboard said it was due to familiarity. Of the users who preferred Canvas, 78% liked it better because of its ease of navigation. These results are shown in Figure 1.

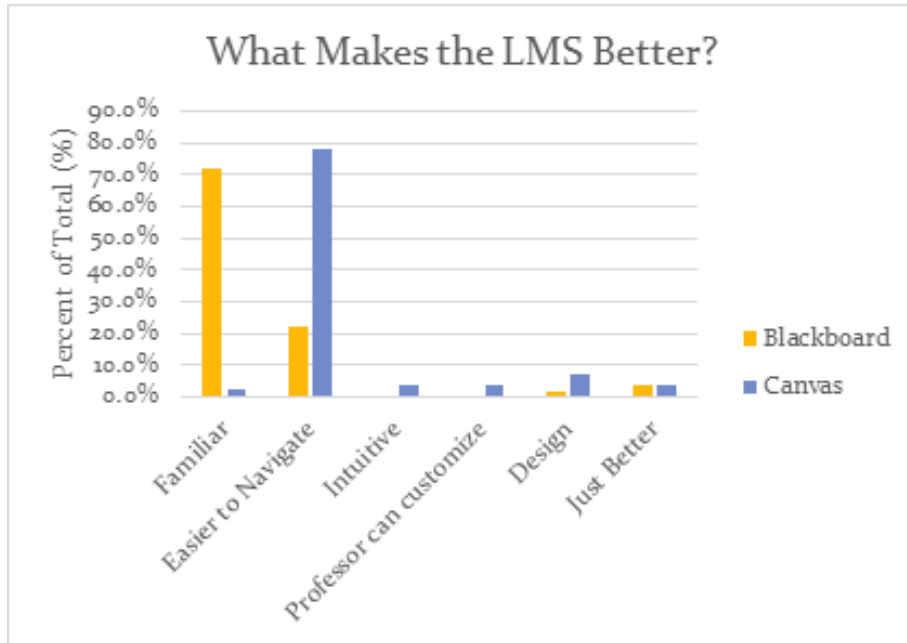


Figure 1: Comparison of Learning Management Systems

Histograms were created using Minitab 17 to show the distribution of the overall rankings for Canvas (Figure 2) and Blackboard (Figure 3) from the student survey. A Likert scale was used with 5 as strongly positive, 3 as neutral, and 1 as strongly negative. The distribution for Canvas is skewed to the right, while the distribution of Blackboard data is a normal distribution. This shows that overall more people ranked Canvas with rankings of 3, 4 and 5, while Blackboard mainly received rankings of 3 and 4.

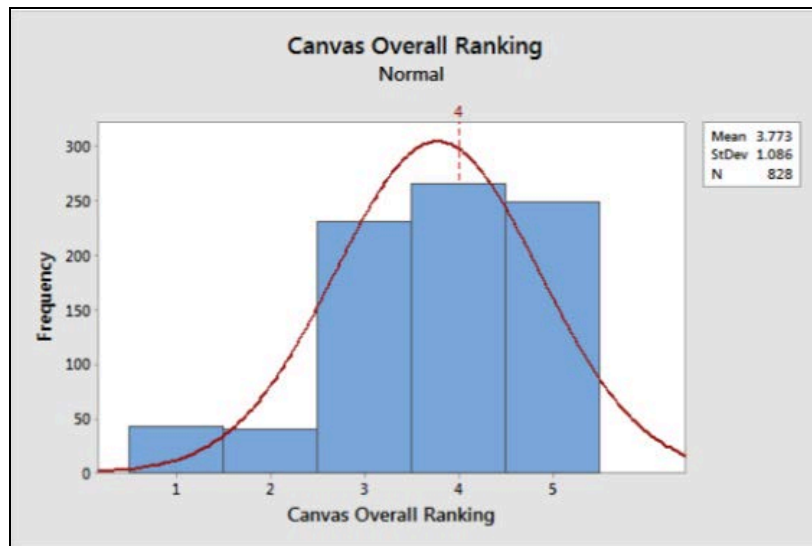


Figure 2: Histogram for Canvas LMS Overall Ranking

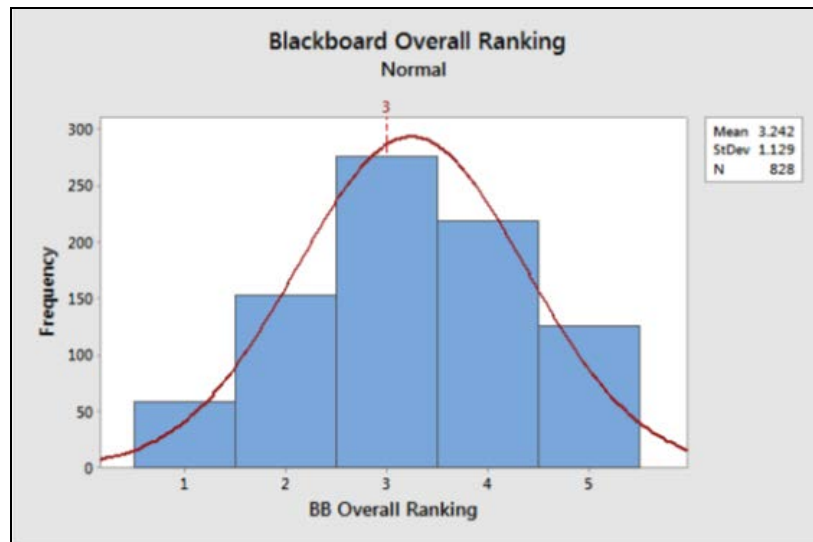


Figure 3: Histogram for Blackboard LMS Overall Ranking

Usability Study Analysis

Data was obtained on the actual ease of use for each LMS. Overall, the number of clicks required was better for Canvas. Although the time it took to complete tasks was typically faster in Blackboard. The usability data for the five tasks is summarized in Table 2.

Table 2: Usability Results for Each LMS

Task	Average # of clicks Blackboard	Average Time(s) Blackboard	Average Clicks/Sec Blackboard	Average # of clicks Canvas	Average Time(s) Canvas	Average Clicks/Sec Canvas
1 Download Syllabus	3.25	13.75	0.24	2.75	17.00	0.16
2 Find Assignment	3.25	21.38	0.15	3.13	22.88	0.14
3 Find Assignment Submission	2.38	19.63	0.12	2.25	16.63	0.14
4 Find Grade	3.38	27.50	0.12	2.25	12.13	0.19
5 Logout	2.00	7.50	0.27	3.00	12.88	0.23

The usability study also uncovered an issue with variability in the systems. The interface with the LMS differed for each class based how the professor sets up the course. This was an issue for the student users. From a student's perspective, it would be beneficial to implement standardization between courses in an LMS.

The 2015 survey explored users' preferences between Blackboard and Canvas. Table 3 shows which LMS was preferred for given tasks. Canvas had the highest preference than Blackboard on every task among users with a preference. However, many users stated no preference between the two learning management systems for all of the tasks evaluated.

Table 3: Survey Results

Task	Blackboard	Canvas	No Preference	Preferred
Completing Assignments	69	192	52	Canvas
Receive/Asses Announcements	78	203	31	Canvas
Taking Quizzes	90	150	69	Canvas
Finding Content	96	188	26	Canvas
Participate in Discussion Boards	47	154	107	Canvas
Send Emails	42	126	140	Neither
Participate in Group Activities	34	137	137	Neither
Video Conferencing	25	72	211	Neither
Viewing Lecture Capture Recordings	43	104	159	Neither
Viewing Kaltura Streaming Video	22	65	219	Neither
Other (specify)	10	33	120	Neither
Total Preferred	17.1%	43.8%	39.1%	

Discussion

Based on the feedback from users during the usability study and the surveys, several of the common problems and sources for variability for the two learning management systems on were identified. Figure 4 is a tree diagram to illustrate the proposed methods of improvement for both LMS.

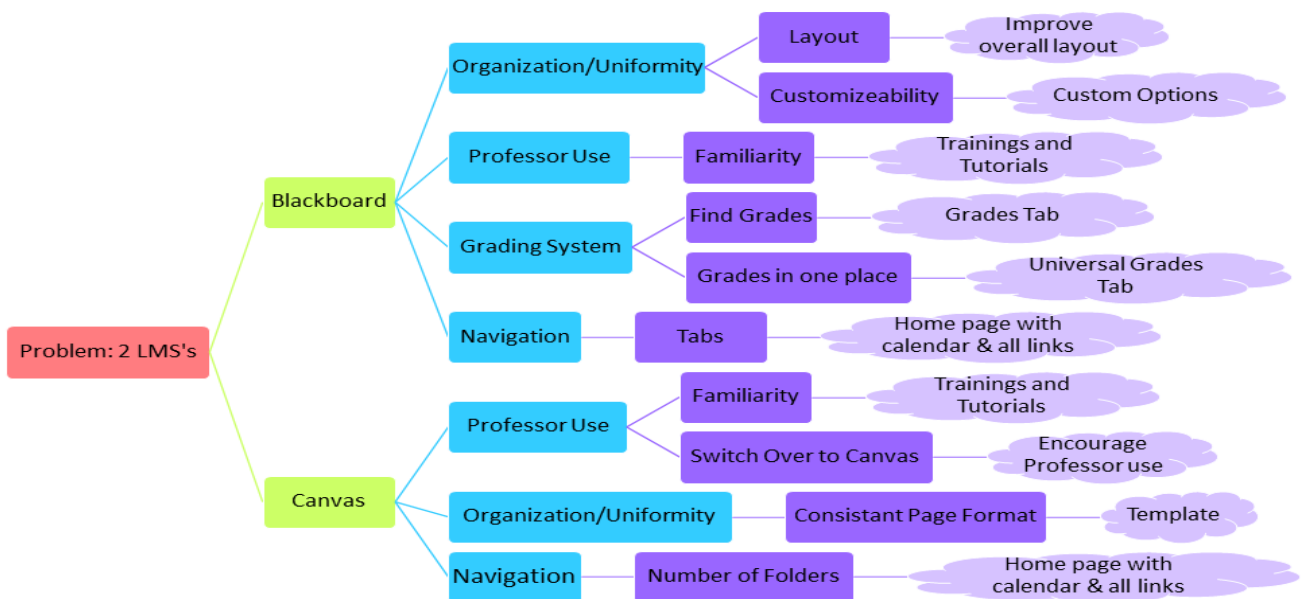


Figure 4: Problems and Suggested Solutions

The data leads to the conclusion that Canvas is the preferred LMS by the users at the university. It had the best usability click-rates, the best ratings on the survey, and the least suggested improvements. However, the students' experience with any LMS is very dependent on the instructor. Frequent comments from the students stated that many of the advanced features of both LMS were not used by some instructors. Perhaps the most common frustration among students is the variability of how instructors formatted and used the LMS. Common items such as the class syllabus and assignments are located in different place in different classes. The will be an ongoing challenge for students and educational designers regardless of the LMS package that is selected. The university has completed its evaluation process and Canvas was selected as the LMS to be used.

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