

Learning Management System Self-Efficacy of Online and Hybrid Learners: Using LMSES Scale

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Keywords: Learning Management System, self-efficacy, online learners

Abstract

One of the educational trends that has revolutionized the way educators teach and students learn is the development of Learning Management System (LMS) software. A LMS gives students the flexibility for “anytime” and “anywhere” learning. The purpose of this study was to develop and validate a new instrument that measures students’ confidence levels with a LMS and how it helps them become self-regulated learners. This instrument includes all the latest features in LMS software (e.g., the virtual synchronous classroom, breakout rooms, blog posting). The correlation between LMS self-efficacy and online performance in an instructional technology course was measured and differences between totally online and hybrid learners were analyzed.

Introduction

Recent advancements in technology have changed the way educators teach and students learn (Wells, Fieger, and de Lange, 2005). In the last decade, educational trends have progressed rapidly in a movement toward Web-based instruction and blended instruction. One example of this revolution is the development of Learning Management System (LMS), Course Management System (CMS), and Virtual Learning Environment (VLE) software that facilitates teaching and learning outside the physical classroom. Many universities use a LMS or a CMS to deliver their courses. These learning environments can be used to totally replace face-to-face teaching in a physical classroom, partially replace face-to-face teaching, or supplement existing face-to-face teaching (Arbaugh and Duray, 2002). The LMS facilitates learning through efficient access to learning materials, providing immediate feedback to students through online assessment (Breen, Cohen, and Chang, 2003) and improved communication between students and instructors through discussion forums and e-mail (Beard and Harper, 2002).

Learning Management Systems

A LMS enables the management and delivery of learning content and resources to students. It provides an opportunity to maintain interaction between the instructor and students and to evaluate the students by providing immediate feedback on online assessments. Most LMS software is Web-based to facilitate “anytime, anywhere” access to learning content and administration. Common LMS software used in higher education fall under two broad categories: (1) commercial systems (e.g., Blackboard, WebCT,

eCollege, Desire2Learn) and (2) open-source products (e.g., Moodle, Sakai, Segue, Coursework).

Blackboard

Blackboard is one of the leading commercial LMS (or CMS) products used in North America and Europe (Munoz and Van Duzer, 2005). Blackboard has powerful capabilities in three key areas: instruction, communication, and assessment. It is the most widely adopted learning management system among United States postsecondary institutions. Blackboard provides for a password-protected community where students access their courses in an online environment. It has the necessary administrative tools to make teaching online easier (Lowe, 2003).

Researchers have compared LMS software based on their functionality, user-friendliness, and cost. Some of the key features that are evaluated in a LMS are its usability, availability, security, stability, interoperability, and scalability (Hall, 2003).

Blackboard was the learning management system used in this study.

Self-Efficacy

Self-efficacy is students' judgment of their own capabilities for a specific learning outcome. Bandura (1997) in his self-efficacy theory, defined self-efficacy as beliefs in one's abilities to carry out a desired course of action. According to Bandura, there are four sources of self-efficacy, and the self-beliefs of students are formed from mastery experience (performance on previous similar tasks); vicarious experience (modeling, or the observation of others' performance on similar tasks); verbal persuasion (feedback from significant others); and physiological and emotional reactions (e.g., anxiety) to specific tasks. Although the informal term *confidence* is sometimes used as a synonym for self-efficacy, it fails to capture the specificity and theoretical base of the construct of self-efficacy (Bandura, 1997).

Furthermore, Bandura suggests the formation of self-efficacy beliefs is based primarily on reflection and interpretation of past performance (also referred to as *enactive mastery experiences*). Previous experiences in which a particular performance was enacted by an individual and was perceived by that individual as successful will tend to raise self-efficacy beliefs related to this performance; those experiences perceived as unsuccessful will tend to lower self-efficacy beliefs. With the technological advancement in this decade, it is important that students are successful in achieving learning and performance outcomes, which results in an increase in their self-efficacy beliefs.

Self-efficacy for technology use may be an important factor for student participation and performance. With courses being taught fully online and in hybrid settings (face-to-face and online), it has become important for students to be confident in their technology skills. According to Eachus and Cassidy (2002), self-efficacy is an important factor in understanding the frequency and success with which individuals use computers. Compeau, Higgins, and Huff (1999) tested the influence of computer self-efficacy beliefs, outcome expectations, affect, and anxiety on computer use and found that computer self-efficacy beliefs had a significant positive influence on computer use.

Purpose

LMS self-efficacy, defined as self-assessment regarding one's skills using a LMS, may be a critical factor in e-learner satisfaction (Lee and Hwang, 2007). The goal of this

study was to explore the relationship between LMS self-efficacy and course performance for fully online and hybrid learners in an instructional technology course.

Method

Participants

Study participants consisted of 69 students enrolled in one of two sections of an instructional technology course. Thirty-three students were enrolled in an online course where a LMS was used for course delivery, and 39 students were enrolled in a hybrid environment in which a LMS was used as a supplement to face-to-face instruction. The study participants were predominantly female (64%) below the age of 24 (50%). Nine (13%) students reported using a LMS in at least one course, 38 (55%) students had used a LMS in two to four courses, 9 (13%) students reported using a LMS in five or more courses, and 12 (17%) students had never used a LMS.

LMSES Survey

The Learning Management System Self-Efficacy Survey (LMSES) was divided into five LMS-related categories and contained five demographic questions. Participants were asked to rate the items on the survey on a four-point Likert scale ranging from (1) not confident at to (4) very confident. Participants completed the survey during the first week of the course.

Results

Item and category means for the LMSES are reported in **Table 1**. Student confidence for accessing the course content was ($M=2.69$), tests and grades ($M=2.73$), asynchronous communication ($M=2.02$), synchronous communication ($M=1.84$), and advanced tools ($M=1.91$).

Table 1. Mean scores for LMSES

Part I – Accessing the Course Content	Online	Hybrid	Overall Mean
I would feel confident to			
1. Log in to my course in the LMS	2.88	2.75	2.81
2. Read the text-based announcements posted by my instructor	2.94	2.72	2.83*
3. Listen to the voice-based announcements posted by my instructor	2.79	2.08	2.42*
4. View my instructor's information, such as name, office hours, and office location	2.97	2.78	2.87*
5. View the course documents online	2.97	2.78	2.87*
6. Download the course documents to my computer	2.91	2.75	2.83
7. Access the links to the Web resources	2.94	2.83	2.88

8. Access the course calendar and tasks assigned	2.88	2.83	2.85
9. Create a homepage with personal information	2.73	1.36	2.01*
10. View profiles of other participants in the course	2.76	2.22	2.48*
Mean	2.88	2.51	2.69*
Part II – Tests and Grades			
I would feel confident to			
11. Take a test/quiz online	2.67	2.47	2.57
12. View the feedback for the online test/quiz	2.79	2.75	2.77
13. Complete a survey online	2.94	2.89	2.91
14. Submit assignments online using a drop box	2.64	2.44	2.54
15. View my grades in the grade book	2.88	2.86	2.87
Mean	2.78	2.68	2.73
Part III – Asynchronous Communication			
I would feel confident to			
16. Send text-based e-mail to my instructor	3.00	2.80	2.90*
17. Send text-based e-mail to one or more students in my class	2.88	2.66	2.76*
18. Send voice e-mail to my instructor	1.64	0.89	1.25*
19. Send voice e-mail to one or more students	1.61	0.86	1.22*
20. Post text messages in the discussion group	2.97	2.63	2.79*
21. Reply to the text messages in the discussion group	2.88	2.56	2.71*
22. Create a new thread in the discussion group	2.82	2.14	2.46*
23. Download attachments from the messages in the discussion group	2.88	2.53	2.70*
24. Attach files to my messages in the discussion group	2.85	2.50	2.67*
25. Post voice messages to the voice board	1.61	0.83	1.20*
26. Reply to the voice board messages	1.67	1.03	1.33*

27. Import and export voice messages	1.55	0.83	1.17*
28. Create an audio Podcast	1.09	0.67	0.87*
29. Exchange files with my group members	2.58	2.17	2.36*
Mean	2.29	1.79	2.02*
Part IV – Synchronous Communication			
I would feel confident to			
30. Join a text-based chat session	2.58	2.31	2.43*
31. Read messages from one or more members in a synchronous text-based chat system	2.55	2.17	2.35*
32. Post or reply to a message in a synchronous text-based chat system (one-to-many interaction)	2.55	2.14	2.33*
33. Interact privately with one member of the synchronous text-based chat system (one-to-one interaction)	2.55	2.14	2.33*
34. View archived text-based chat sessions	2.27	2.00	2.13
35. Join a virtual class session, such as Horizon Wimba or Blackboard Virtual Classroom	2.15	1.56	1.84*
36. Use the Whiteboard tools in a virtual class session	1.61	1.25	1.42
37. Join a breakout room in a virtual class session	1.64	1.08	1.35*
38. Display a Web browser from within a virtual class session	1.67	1.33	1.49
39. Ask questions to the moderator of the virtual class session	2.00	1.47	1.72*
40. Direct message with the other participants in the virtual class session	1.88	1.42	1.64*
41. Post my responses by selecting different options (e.g., polling, hand raising) in the virtual class session	1.73	1.36	1.54
42. Moderate a virtual class session (e.g., load presentations, archive settings, grant user permissions)	1.33	1.22	1.28
Mean	2.04	1.65	1.84*
Part V – Advanced Tools			
I would feel confident to			
43. Post my reflection to a journal	2.18	2.14	2.16
44. Post my reflection to a blog	2.15	1.94	2.04
45. Comment on a blog posting	2.18	2.11	2.14
46. Collaborate on web pages to add, expand, and change the content (Wiki)	2.00	1.42	1.70*

47.Read news publications using RSS feeds	1.85	1.34	1.59*
48.Get context-sensitive help	2.12	1.58	1.84*
Mean	2.08	1.76	1.91*

Note. * is used to represent $p < .05$ significance between online and hybrid learner LMS self-efficacy.

Three different analyses were conducted to test for differences between the online and hybrid learners. A multivariate analysis of variance (MANOVA) conducted on the overall data indicated students enrolled in the online course reported significantly greater self-efficacy than students enrolled in the hybrid course, $F(1, 68) = 14.194$, $p < .01$. Follow-up univariate analyses for the five categories revealed significant differences at the $p < .01$ level for four of the five categories, all indicating greater self-efficacy for students in the online course. Tukey post hoc analyses revealed significant differences on 31 of the 48 items again, all favoring students in the online course. No significant differences were found for items in the Tests and Grades category.

LMS Self-Efficacy and Course Performance

Regression analysis was conducted to examine the effect of learner LMS self-efficacy on course performance. In this study, LMS self-efficacy of the hybrid learners had a positive influence on their course performance $F(5, 35) = 3.81$, $p < .05$, whereas, LMS self-efficacy of the online learners did not have a significant effect on their course performance $F(5, 32) = .642$, $p > .05$.

Discussion

Perhaps the most interesting finding is the significant positive correlation of self-efficacy course performance for the students in the hybrid course, despite reporting significantly lower self-efficacy than the students in the online course in four of the five categories measured. Neither group reported a relatively high level of self-efficacy. The highest reported self-efficacy value for either group, "Send text-based e-mail to my instructor," had a mean of 3.0 (Somewhat Confident) for online learners. This could mean there is a baseline competence with LMS use required for success, but once that level is perceived, greater self-efficacy with the system is not required.

Furthermore, it is perplexing that the significant positive correlation occurred for the hybrid learners. It would seem that the use of the LMS as a supplement to face-to-face instruction would require less confidence with the system than in a course in which all content is delivered through the LMS. Other factors that may have influenced this finding could be discrepancies in the use of various tools between the courses or other differences in the learners. Hybrid learners had the option to enroll in the fully online version of the course, but self-selected into the hybrid version. This may be due in part to their perceived lower self-efficacy with the delivery system. Clearly, more investigation is required. Future studies are needed to examine other factors influencing course format selection.

Finally, the only LMSES category that did not yield a significant difference was Tests and Grades. This was also the highest rated category ($M=2.73$). We suggest this finding is an indication of the predominant use of a LMS throughout each student's experience. As suggested by Bandura (1997), the formation of self-efficacy beliefs is based primarily on reflection and interpretation of past performance. If this is the case, it

is unfortunate that the vast array of learning support features of a contemporary LMS are not utilized.

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