

Migrating Learning Management Systems in Higher Education: Faculty Members' Perceptions of System Usage and Training When Transitioning From Blackboard Vista to Desire2Learn

Journal of Educational Technology

Systems

2017, Vol. 46(2) 259–277

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DOI: 10.1177/0047239517711954

journals.sagepub.com/home/ets



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Abstract

This study examined a migration from Blackboard Vista to Desire2Learn (D2L) within a multiuniversity system. Faculty members' perceptions from two of the systems' colleges were evaluated using a questionnaire based on Davis' technology acceptance model. Researchers analyzed responses for differences in system usage experience of faculty and in faculty usage of training and support services. Overall, faculty had positive experiences (or experienced few issues) with use of D2L and seemed to use fewer training and support resources during the migration. Although no statistically significant difference was found, recommendations were made to inform future migrations' success.

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Keywords

learning management system (LMS) migration, faculty support, instructional technology and design, faculty professional development, technology acceptance, LMS usage

In today's universities and colleges, administrators and information technology (IT) professionals are investigating the best instructional technologies and systems to implement within the face-to-face, hybrid, and online teaching environments. Some of the biggest issues with any new technology implementation are providing adequate training and support to assist users with learning these new technologies, in addition to identifying what common challenges are faced when using these technologies.

One instructional system that institutions sometimes decide to change is a learning management system (LMS). An LMS, sometimes referred to as a course management system or a virtual learning environment, is a system which many faculty members adopt across an entire university or college to improve student learning and overall course management (McGill & Klobas, 2009). When an LMS migration occurs, faculty members not only have to adapt their teaching patterns (e.g., new LMS tools/features) but also have to learn how to use the system, often in a very short period of time. By investigating LMS migrations at other institutions, administrators and IT professionals can determine the best type of training and support to provide faculty members. In addition, by determining the common issues faced during the migration (e.g., browser issues), further training and support around these problems can be developed.

Many studies within the last decade have been conducted on faculty use and adoption of an LMS (Al-Busaidi, 2009; Avgeriou, Papasalouros, Retalis, & Skordalakis, 2003; Black, Beck, Dawson, Jinks, & DiPietro, 2007; Little-Wiles & Naimi, 2011). While some studies presented common issues that faculty faced while learning to use the LMS, these studies did not investigate issues faced or the level of support used during an LMS migration. While very few studies have been conducted to determine the challenges and level of technical support used by faculty members during a migration, the authors do explore this area within the literature review section, "Faculty Challenges with LMS Migrations."

Purpose and Framework

The purpose of this research study was to determine the common challenges faculty members faced during an LMS migration and what technical support and training options faculty used to learn the new LMS in multiple institutions of higher learning in a system-wide migration. The intent was also to provide information to administrators who may be responsible for migrating systems,

so they can learn from other schools that have accomplished this move. Factors that were expected to influence the study included how many years of experience each faculty member had using an LMS, the number of years he or she had taught online or hybrid courses, and gender.

The problems described in the earlier section were examined closely by comparing the old LMS (i.e., Blackboard Vista) to the new LMS (i.e., Desire2Learn). The two main research questions guiding this study were as follows: (a) What were the challenges faculty members encountered during the migration from Blackboard Vista to Desire2Learn? and (b) What level of support and training was used by faculty members during the migration of Blackboard Vista to Desire2Learn?

The framework underlying this study incorporated Venkatesh and Davis' (1996, 2000) technology acceptance model (TAM), a very recognized technology adoption model. The overall purpose of TAM is to predict end-user acceptance of various technology systems by determining the user's perceived ease of use and perceived usefulness of the system (Venkatesh & Davis, 1996, 2000; Venkatesh, Morris, Davis, & Davis, 2003). Ultimately, Venkatesh and Davis (1996, 2000) suggested that if the user's perceived ease of use and perceived usefulness is high, the user will adopt and use the system. For this study, only perceived ease of use was measured. The researchers omitted the second factor, perceived usefulness, as this factor has the greatest value when adoption of unfamiliar technology is being considered. In this study, faculty members were already familiar with the nature and purpose of a previous LMS (Blackboard). It is important to note that before selecting TAM, the researchers did investigate other models often used to predict technology adoption to include level of use of the innovation (Hall, Loucks, Rutherford, & Newlove, 1975), diffusion of innovation (Rogers, 2003), and the unified theory of acceptance and use of technology (Venkatesh et al., 2003).

Literature Review

In the following literature review, the authors explore the TAM and literature related to the challenges faculty encounter when faced with a LMS migration. Al-Busaidi (2009) estimated that 90% of institutions of higher learning have adopted an LMS and provide access to faculty and students. Furthermore, since the 1990s, there has been an increasing demand for faculty to use technology to meet the demands of their student consumers (Daugherty & Funke, 1998).

TAM

TAM is an established framework that has been used in a variety of contexts to explain the process of how end users accept and use new innovations (technologies). TAM, as envisioned by Davis (1989), is a derived "adoption of the TRA

(Theory of Reasoned Action) specially tailored for modeling user acceptance of information systems” (p. 985). Researchers view the major strengths of the TAM to include “specific focus on information system use, its theory base of social psychology, as well as the validity and reliability of its instruments” (Elwood, Changchit, & Cutshall, 2006, p. 339). Researchers often use this model because it receives strong theoretical and empirical support in literature to “describe the issue of how users accept and use a specific technology, as a function of the causal relationships between systems design, features, perceived usefulness, perceived ease of use, attitude toward using, and use” (Padilla-Meléndez, Aguila-Obra & Garrido-Moreno, 2013, p. 307). TAM, used as the framework for this study, has two particular beliefs that will determine end-user acceptance: perceived usefulness and perceived ease of use (Venkatesh & Davis, 1996). Venkatesh & Davis’ 1996 TAM model indicates that external variables influence these two perceptions, which in turn can influence each other. These perceptions then impact behavioral intention which then help determine whether a person will actually use a system.

According to Van De Bogart and Wichadee (2015), by “studying these perceptions of users we can better understand the acceptance of these new technologies and determine if users can learn more effectively when using them” (p. 69). Furthermore, Rucker and Downey (2016) suggested that “if an individual determines that a technology system/product is useful and easy to use, that individual has a high likelihood of adopting the system” (TAM, para. 2). Silva (2007) critically analyzed the TAM model and found it to be “an example of normal science” (p. 256), while Lee, Hsieh, and Chen (2013) wrote that “existing parameters of TAM are not sufficient to fully reflect the end-users’ acceptance of e-learning systems within organizations” and called for “examination of additional factors” (p. 174).

It is important to note that perceived usefulness and perceived ease of use are two different factors within the TAM. Perceived ease of use is “the degree in which the prospective user expects the target system to be free of effort” (Davis, Bagozzi, & Warshaw, 1989, p. 985) and perceived usefulness is “the prospective user’s subjective probability that using a specific application system will increase his or her job performance within an organization content” (p. 985).

Faculty Challenges With LMS Migrations

Educational technology is always changing, which often leads to universities and colleges to migrate or upgrade to new technologies. According to Ryan, Toye, Charron, and Park (2012), “change is one of the top ten information technology (IT) issues” (p. 222) facing any organization or university. In their study, Ryan et al. investigated a college that transitioned from one LMS to another LMS to determine what challenges, issues, or hesitations their faculty members faced. Two underlying themes were found as a result of surveying all college faculty:

(a) Faculty members felt as though they had little time to revisit or redesign course material(s) before the migration, and (b) faculty members made little to no attempts to attend prior trainings offered by the institution on learning to use the new LMS before the launch. Ryan et al. recommended for future migrations that IT departments must provide clear documentation on what content or material will and will not transfer to the new LMS, along with technical and instructional support teams to understand that faculty members have busy schedules with teaching, research, and administrative duties. These support teams must determine the appropriate times to hold training sessions and provide training in various formats (e.g., online, face-to-face, video tutorials, etc.).

In a similar study conducted by Ge, Lubin, and Zhang (2010), two common themes were found after interviewing selected faculty members. The first theme was the ability for faculty members to have more control setting up the layout and organization of their course. Within the new LMS, the latest tools and options “enabled them to customize the course design, experiment with different instructional techniques, and further extend their creativity” (p. 441). However, because the new LMS provided these additional options (and some tools were named differently compared to the old LMS), faculty spent a good amount of time figuring out how to find and use these tools. The second theme was that during the migration, faculty members had to perform not only instructor duties but also instructional designer duties. This was largely because instructional designers, throughout the migration process, were busy testing the system, learning the system themselves, and had little time to serve as designers with faculty. Nevertheless, instructors did receive documentation and training to transition their content from the old LMS to the new LMS. Prior studies point out that faculty members who teach online require skills beyond lecturing in front of the classroom, including those skills of a facilitator and instructional designer (Bennett & Lockyer, 2004; Goodyear, Salmon, Spector, Steeples, & Tickner, 2001; Yang & Cornelious, 2005).

Seaman’s (2009) study found that there was not a lot of quantitative data regarding factors related to faculty who teach online, including related to gender. In this study, the author did find that females were more likely to create and teach online courses. Gender was selected as an independent variable based on Seaman’s 2009 research which found that after “examination of online teaching and course development by gender, females had a consistency higher rate of involvement than males” (p. 21). Seaman also found that “online participation by tenure status does vary by gender” (p. 22).

Daugherty and Funke (1998) found barriers for faculty when using an LMS to be related to lack of support, poor preparation time, insufficient software and technology, and low technical knowledge. They also identified another limitation of an LMS as the requirement for faculty members to have technology skills and access to training and support. Gautreau (2011) wrote that faculty members’ acceptance of an LMS is related to tenure status, level of LMS experience, and

computer experience. Al-Busaidi (2009) also recognized that the more a person daily uses technology, the more his or her skills will “transfer to teaching and technology” (p. 11).

Finally, Benson and Palaskas (2006) concluded that administrative challenges and communication were the biggest issues when an LMS was first introduced to faculty members. In the study, common administrative challenges included: (a) the physical administration of two systems, (b) faculty awareness, and (c) computer plug-ins. Throughout the migration, faculty members, IT administrators, and other personnel had to use both LMSs which often caused confusion. Benson and Palaska found that training (faculty awareness) was successful if it had been conducted after the LMS was implemented because faculty members were given the chance to experiment with the LMS and its features in real time. Finally, in order to use the new LMS, additional plug-ins or updating of plug-ins (e.g., Adobe Flash) was required. Many faculty members did not download (or have) the latest versions of these plug-ins.

The two biggest communication challenges included: (a) maintenance schedules and (b) regular meetings. Faculty members suggested that the IT department produce set maintenance schedules of when the LMS would be down. Finally, faculty members indicated that they would like for the university to provide regular scheduled meetings. This would allow faculty members, the IT department, and other university members to discuss the current challenges and issues and to present questions that need to be addressed.

Design and Method

To achieve the study’s purpose and understand the main challenges faced and level of support used by faculty as they migrate from one LMS platform to another, more than 1,200 faculty members were asked to participate in a survey regarding their technological challenges and level of support used when migrating their courses from one LMS to another LMS (Blackboard Vista to Desire2Learn).

Participants

Participants in this study included both full-time and adjunct faculty members within a large university system located in the southeastern part of the United States. At the time of the study, this system comprised 14 institutions of higher education, all of which utilized the same LMS systems and all went through the same LMS migration between systems (Blackboard Vista to Desire2Learn) at the same time. The new LMS was hosted on a state-wide server infrastructure. To allow all institutions to provide feedback, each institution’s distance learning manager was sent an initial e-mail to determine his or her level of interest.

Two universities located in the southern and southwestern parts of the state agreed to participate.

The university located in the southern part of the state employed 728 full-time and part-time faculty members, with approximately 10,000 undergraduate students and 2,200 postgraduate students. According to The Carnegie Classification of Institutions of Higher Education (n.d.), the university is considered a large 4-year primary residential university. In comparison, according to The Carnegie Classification of Institutions of Higher Education (n.d.), the university in the southwest is considered a medium 4-year residential university. This university employed 508 full-time and part-time faculty members at the time of this study, with approximately 8,164 undergraduate and graduate students.

Data Collection Procedures

Once the distance learning manager and other required university administrators agreed to participate in the study, faculty members (both full time and adjunct) received an initial e-mail to complete an online survey. Criterion for participation in the survey was that a faculty member had been using the new LMS (Desire2Learn) at least one semester prior to the survey being deployed. Overall, participants had roughly 2 weeks to complete the online survey before another e-mail reminder was sent. In all, four solicitation e-mails were sent during the span of mid-October to mid-December. By permitting faculty members to use the new LMS one semester and providing a 2-month span to complete the survey, faculty members were, therefore, given sufficient time to familiarize themselves with the new LMS. In addition, this provided an opportunity for participants to attend various training options and determine the main challenges encountered (one of the main purposes of the study).

Survey Instrument

To collect the required data for this study, a survey instrument was designed and consisted of both Likert-type scale and open-ended questions to collect a small portion of qualitative data. Overall, the survey comprised five sections, including (a) demographic information, (b) faculty's level of use of LMS tools, (c) experience using Desire2Learn, (d) learning how to use Desire2Learn, and (e) open-ended questions. Internal reliability was measured using Cronbach's α ($\alpha = .89$, $M = 102.36$, $SD = 26.46$, indicating a high degree of internal consistency). For this study, only the experience using Desire2Learn (Section 3) and learning how to use Desire2Learn (Section 4) were analyzed. Cronbach's α for Experience Using Desire2Learn and Learning How to Use Desire2Learn subscales was .88, and .63, respectively, indicating acceptable internal consistency.

Section 3, experience using Desire2Learn, of the survey comprised a Likert-type scale with five options, where 1 = *strongly disagree*, 2 = *somewhat disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, and 5 = *strongly agree*. Participants were asked to select their level of agreement related to their experiences using D2L and its migration with difficulties related to the following: browser issues, plug-ins missing or needing to be installed, slowness of the system, course content transferring over with correct content, navigation through the LMS, time-out length, and the overall preparedness for the migration. These questions' responses were combined into a new variable, *system usage experience*.

Section 4, learning how to use Desire2Learn, of the survey used a frequency scale of 1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, and 5 = *always* to determine the level of perceived ease of use by investigating participants' use of the various training and support options. Questions on the instrument included asking participants if they view e-learning tutorials, attend training workshops provided by the university, call university technical support, ask for the assistance of a coworker, use the Internet, or if they use other resources. These items were combined into a new variable labeled *training*.

Hypotheses

There were two research questions, each testing one hypothesis:

- (1) What are the challenges faculty members encountered (system usage experience) during the migration from Blackboard Vista to Desire2Learn as influenced by gender and hybrid and online teaching experience?

Null Hypothesis 1: There are no significant differences in faculty members' experience (system usage experience) during the migration from Blackboard Vista to Desire2Learn based on the years having taught online or hybrid based courses and gender.

- (2) What level of support and training (training) was used by faculty members during the migration of Blackboard Vista to Desire2Learn?

Null Hypothesis 2: There are no significant differences in faculty members' use of various training and support options (training) based on the years of experience using an LMS and the years having taught online or hybrid courses.

To address Hypothesis 1, a two-way factorial analysis of variance (ANOVA) was constructed. This factorial ANOVA was tested using a new variable called *system usage experience*, which computed the overall rating from the mean of all questions answered in Section 3 of the survey instrument. To investigate Hypothesis 2, a second two-way factorial ANOVA was created. The factorial ANOVA was tested using a new variable called "training," which computed the

overall rating from the mean of all questions answered in Section 4 of the instrument. The findings for both hypotheses are presented below. These hypotheses were analyzed using IBM Statistical Package for Social Sciences Mac version 22.

Responses to the open-ended items' responses were coded and evaluated for themes related to system usage experience and training and were analyzed using basic qualitative methods.

Results

The online survey was deployed to 1,236 faculty members over the span of 3 months. Overall, 305 faculty members completed the survey to achieve an initial response rate of 24.7%. However, a total of 51 entries were removed due to incomplete or missing section(s), resulting in a final response rate of 20.55% with an estimated 5.5% error rate.

Null Hypothesis 1

To test Null Hypothesis 1, a two-way factorial ANOVA was constructed. This factorial ANOVA was tested using a new variable called system usage experience, which computed the overall rating from the mean of all questions answered in Section 3 of the survey. The system usage experience levels consisted of a 5-item Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5).

As shown in Table 1, comparison of online/hybrid teaching and gender for overall experience, more female faculty members participated compared to male

Table 1. Comparison of Online/Hybrid Teaching and Gender for Overall System Usage Experience.

Years' experience teaching online/hybrid	Gender					
	Male			Female		
	M	SD	n	M	SD	n
<1 Year	2.96	0.65	37	2.89	0.69	55
1-5 Years	2.80	0.82	40	2.87	0.73	62
6-10 Years	2.74	0.80	12	2.71	0.75	23
11-15 Years	3.17	0.95	10	2.94	1.14	11
16-20 Years	1.78	0	1	2.39	0.24	2
>20 Years	0	0	0	1.78	0	1
Total	2.88	0.78	100	2.85	0.75	154

Note. n = 254

faculty members. Only one female faculty member reported that she had more than 20 years of experience teaching online or hybrid-based courses while only one male faculty member reported that he had 16 to 20 years of experience teaching online or hybrid-based courses. These two faculty members were the highest in the number of years having taught online or hybrid-based courses. Both females and males with 1 to 5 years of experience teaching online or hybrid-based courses participated the most in this section of the survey compared to any other category. Overall, most of the faculty members who participated in this section of the survey had less than 5 years of experience teaching online or hybrid-based courses. Male faculty members' overall mean responses ranged from 1.78 to 3.17. This indicated that male faculty members *strongly disagree* (meaning have a positive experience) to *neither agree nor disagree*. Female faculty members' overall mean responses ranged from 1.78 to 2.94. This indicates that female faculty members *strongly disagree* (meaning have a positive experience) to *somewhat disagree*.

A two-way factorial ANOVA was used to evaluate whether gender of the faculty member and the years of actively teaching online or hybrid-based courses affected the system usage experience of using Desire2Learn after migration. The 2×2 between-subjects ANOVA failed to reveal a main effect for gender, $F(1, 254) = 0.12$, $MS_e = .07$, $p > .05$. In addition, the same 2×2 between-subjects ANOVA failed to reveal a main effect of years of experience teaching online or hybrid based courses at higher education institutions, $F(5, 254) = 1.56$, $MS_e = .90$, $p > .05$. This two-way factorial ANOVA revealed that there were no statistically significant differences in the means for system usage experience based on gender and years of experience teaching online or hybrid-based courses at higher education institutions, $F(4, 254) = .33$, $p > .05$.

These results indicate that overall system usage experience is not determined by the number of years a faculty member has teaching online or hybrid courses. In comparison, the same overall system usage experience is not determined by the gender of the faculty member. Lastly, when combining these two independent variables (years of having taught online or hybrid-based courses and the gender), no statistically significant results occurred.

Null Hypothesis 2

To test Null Hypothesis 2, a two-way factorial ANOVA was constructed. This ANOVA was tested using a new variable called training, which computed the overall rating from the mean of all questions answered in Section 4 of the survey. The learning scale consisted of a 5-item Likert-type scale ranging from *never* (1) to *always* (5).

As shown in Table 2, comparison of years of LMS experience and online/hybrid teaching experience for training, more faculty members who had less than 1 year of teaching online or hybrid courses but more than 5 years using an LMS

Table 2. Comparison of Years of LMS Experience and Online/Hybrid Teaching for Training.

Years' experience teaching online	Years of Experience using an LMS other than Blackboard and Desire2Learn											
	<1 Year			1-3 Years			4-5 Years			>5 Years		
	M	SD	n	M	SD	n	M	SD	n	M	SD	n
<1 Year	1.94	.75	66	2.34	.97	19	2.33	.33	3	2.92	.82	4
1-5 Years	2.43	.67	46	2.60	.56	38	2.63	.61	12	2.89	.99	6
6-10 Years	2.40	.72	12	2.56	.66	12	2.38	.16	4	2.36	.43	7
11-15 Years	2.52	.90	8	2.81	.50	9	2.39	.59	3	1.67		1
16-20 Years			0	2.75	.82	2	2.83		1			0
>20 Years			0						0	2.50		1
Total	2.19	.76	132	2.56	.69	80	2.52	.50	23	2.61	.76	19

Note. *n* = 254. LMS = learning management system.

other than Blackboard Vista and Desire2Learn had a higher mean compared to any other faculty members in additional categories. Only one faculty member reported that he or she had 11 to 15 years of teaching online or hybrid courses and more than 5 years using an LMS other than Blackboard Vista and Desire2Learn; this response was the lowest mean compared to any other faculty members. This indicates that this faculty member used fewer technical support options, both provided by the university and not provided by the university, than any other faculty member. In addition, more faculty members who had 1 to 5 years of teaching online or hybrid courses completed the survey instrument compared to any other faculty grouping. Overall, faculty members' responses ranged from a mean of 1.67 to 2.92, equating to the *never* to *rarely* categories on the learning scale. This seemed to indicate that faculty members used fewer university or external resources when learning to use Desire2Learn after the implementation of the new LMS.

Prior to analysis, the data were checked for adherence to statistical assumptions. Levene's test showed that the assumption of equal variances was not violated, $F(18, 235) = 1.45, p > .05$.

A two-way factorial ANOVA was used to evaluate whether the years of actively teaching online or hybrid-based courses at higher education institutions and the years of using an LMS other than Blackboard Vista and Desire2Learn affected whether a faculty member participated in Desire2Learn training activities. The 2×2 between-subjects ANOVA failed to reveal a main effect of the years of actively teaching online or hybrid-based course, $F(5, 254) = 0.75, MS_e = .38, p = > .05$. In addition, the same 2×2 between-subjects ANOVA failed to reveal a main effect of years of using an LMS other than Blackboard Vista and Desire2Learn, $F(3, 254) = .87, MS_e = .43, p > .05$. This two-way

factorial ANOVA revealed that there were no statistically significant differences in the means for whether a faculty member participated in Desire2Learn training activities based on years of actively teaching online or hybrid-based courses at higher education institutions and the years of using an LMS other than Blackboard Vista and Desire2Learn, $F(10, 254) = .88, p > .05$.

These results indicate that the overall training level is not determined by a faculty member's number of years having used an LMS outside of Blackboard Vista or Desire2Learn. In comparison, the same overall training level is not determined by the number of years a faculty member has taught online or hybrid courses. Lastly, when combining these two independent variables (year of using an LMS outside of Blackboard Vista and Desire2Learn and years having taught online or hybrid courses), no statistically significant results occurred.

After analyzing the open-ended question within Section 3, "Please provide a list of additional experiences faced during the migration process from Blackboard Vista to Desire2Learn," three themes were identified. These themes included: no issues, minor complications, and serious complications. For the open-ended question within Section 4, "What other types of strategies have you used to overcome the difficulties of using Desire2Learn," six major themes were identified. These themes included: calling the IT phone support, trial and error, attending training sessions, asking a coworker, self-taught, and other methods.

Discussion

The two main research questions guiding this study were (a) What were the challenges faculty members encountered during the migration from Blackboard Vista to Desire2Learn? (Hypothesis 1) and (b) What level of support and training was used by faculty members during the migration of Blackboard Vista to Desire2Learn? (Hypothesis 2).

Hypothesis 1

With any new system, the overall system usage experience will most likely vary from one user to another user. In this study, the system usage experience was evaluated on a 5-item Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). Faculty members were provided various difficulties faced (e.g., Desire2Learn runs slower, additional plug-in were required, etc.) in which they had to rank their system usage experience. Overall, faculty members stated that Desire2Learn was neither a complex nor easy-to-use system compared to Blackboard Vista ($M = 3.05$) and that Desire2Learn does not work any different in various browsers ($M = 3.34$). Further, one of the main issues with the previous LMS (Blackboard Vista) was the timeout issue; faculty members would stop

working for 30 minutes and would have to sign back into the LMS, losing any unsaved work in the process. This received the lowest score within Section 3 ($M=2.56$). Overall, this means that Desire2Learn improved over the Blackboard Vista LMS, where a 2 on the System Usage Experience scale indicated *somewhat disagree*. In addition, faculty members provided that fewer plugins have to be installed compared to Blackboard Vista ($M=2.82$) and that Desire2Learn runs faster than Blackboard Vista ($M=2.73$). Again, given that a 2 on the system usage experience scale indicated somewhat disagree and the questions were written in a negative format. Provided the above information, overall faculty members responded that Desire2Learn was a better and more stable LMS compared to the Blackboard Vista LMS.

These results indicated the overall faculty members' perceived that ease of use is higher for D2L compared to the Blackboard Vista LMS. Venkatesh and Davis (2000) suggested that improving the interface of the system to be more end-user friendly is one of the biggest ways to improve perceived ease of use. Given the results of the study, faculty members' results indicated that the Desire2Learn interface has been improved over the Blackboard Vista interface and is easier to navigate and use.

Another key external variable within the TAM is the attitude of the end-user. A few faculty members in their open-ended responses indicated that they wanted to use a more updated LMS, given that the university was using an LMS that was no longer supported by Blackboard, Inc. Provided that these faculty members wanted to use a new LMS, their attitude at adopting and learning to use a new LMS could have helped contribute to reasons why faculty members believe Desire2Learn has been a better system.

This study found that gender and the years of having taught online or hybrid-based courses had no effect on the overall system usage experience (Null Hypothesis 1). Although more females participated in this study, results indicated that gender did not have a statistically significant effect on the overall system usage experience.

Hypothesis 2

The level of support and training as defined in this study refers to the overall level that faculty members used the resources provided to them to learn the new LMS, Desire2Learn. These resources included phone support, tutorials, handouts, coworkers, and internal trainings within the university and also using external resources, such as the Internet or other external help. The TAM advocates that one of the critical external variables that will determine whether a user will accept or not accept a technology innovation is the level of training and support provided and used by the end-user (Venkatesh & Davis, 1996).

Overall, faculty members' least used outside resources, such as the Internet ($M=2.10$) compared to university e-learning tutorials ($M=2.39$) or attending

training or workshops ($M = 2.79$). Faculty members evaluated their use of various training and support options based on a 5-item Likert-type scale ranging from *never* (1) to *always* (5). These results indicated that faculty members *rarely* to *sometimes use* the training or support tools provided to them. This seemed to be in line with Ryan et al.'s (2012) study which specified that faculty members did not attend much of the training or used the resources that the university had provided them.

In addition, faculty members indicated that the support and training level was low because the university did not provide multiple opportunities to attend training, receive instructional support, and so on. For an example, a few faculty members stated that they wished the university had held training sessions on different times and days. Again, Ryan et al. (2012) strongly urged universities to offer multiple training options or even train faculty members by departments. College administrators and instructional support teams must recognize that faculty members have various schedules and cannot always meet at specific times for training on a short notice. Providing faculty members with a set schedule, a few months in advance, will offer them the opportunity to plan their teaching and research schedules around the various training options being offered. Another suggestion to college administrators is to deliver training options using online synchronous technologies. This could even allow adjunct faculty members to attend training sessions while at their other place(s) of employment or from off-campus.

In addition to investigating at what level faculty members used training resources, this study investigated if the overall level of training level used was influenced by the years of experience using an LMS and the years of having taught online or hybrid courses (Null Hypothesis 2). Results indicated that these two independent variables had no effect on the level of support and training faculty members used. Further analysis of the open-ended questions indicated that faculty members received the most help on troubleshooting their issues by calling the IT Help Desk. Having a technical support line for the end-user (faculty members) to call to receive immediate help often ensures that the organization is dedicated and wants to make sure their issues are resolved in a positive and quick matter. Thus, many faculty members in their open-ended response indicated that receiving the support from the IT Help Desk made their transition better because these technicians provided them with immediate responses and help. By receiving this immediate help, faculty members were able to better serve their students and continue teaching their courses with minimal interruptions. Ultimately, faculty members calling the IT Help Desk and having a positive experience ties back into the TAM model. TAM states that one of the external variables of end-user technology adoption is the user's previous experience with the system. Provided that most faculty members had a positive experience with this migration by receiving immediate help through the IT Help Desk, when the next migration occurs these faculty members will be more willing to

change to a new LMS (or other university system) because of their previous positive experience.

Recommendations for Future Research

A number of recommendations can be offered for future research as a result of this study.

First is to include graduate and teaching assistants in the sample. At many institutions, graduate and teaching assistants are the primary instructors for various courses. Often these individuals have had specialized training (i.e., graduate teaching seminars) on using instructional technology. Second is to include various types of universities and colleges in the study. Often college and university environments can differ from each other; there are some universities and colleges where faculty members' main priority is focused on teaching, research, or a combination of both research and teaching. Third, it is important to investigate through literature various LMS migrations other than Blackboard Vista to Desire2Learn. In today's market, a university can opt to use Blackboard, Desire2Learn, Canvas, Moodle, LearningStudio, and at least a dozen more LMSs. A fourth, and final, recommendation is to investigate LMS migrations in different parts of the United States and the world. Further research is needed to determine whether the results of these faculty members in this study are similarly compared to those faculty members in different parts of the United States or the world.

Recommendations for Practitioners

As a result of this study, a number of recommendations can be offered to future practitioners. First, it is highly recommended that college administrators should think of an LMS as "an integral part of teaching and learning in higher education" (Eynon, 2008, p. 16). College administrators at one university in South Carolina are supporting the integration of an LMS into classroom instruction by providing faculty members with internally competitive grant programs (e.g., transitioning a face-to-face course to online delivery; University of South Carolina, 2016). Regardless of which grant a faculty member receives, he or she is required to use the LMS and its tools and attend at least two training sessions/workshops during that academic year. Also, college administrators need to approve and support the hiring of additional instructional designers and support staff. Providing one-on-one dedicated assistance to faculty members helps to ensure proper course design and pedagogy is being integrated into their online or hybrid courses. Second, faculty members must be willing to spend time and learn how to use the LMS and its tools. This includes attending training workshops and other opportunities in order to remain effective in the classroom with the LMS and additional instructional technologies. In addition,

faculty members must be willing to experiment and try new LMS tools and technologies. Finally, e-learning staff must provide the necessary training and support to faculty members. One recommendation will be to use the results and feedback from this study to develop a framework for LMS migration which includes not only a migration process but also a detailed training plan for faculty, staff, and students that can be used by other institutions that are considering of migrating. This framework would have a rollout plan, training plan, support needs, and methods to obtain faculty buy-in. Essential to migration is a central communication plan and identification of responsibilities.

As noted in the results of previous research studies, faculty members indicated that workshops/training sessions must be provided at various times and days of the week, including after traditional 8:00 a.m. to 5:00 p.m. business hours. One suggestion is to train faculty members during department meetings or meetings in which a large number of faculty members will be present as well as provide webinars and on-demand video tutorials. During the migration, it is especially important to extend IT support services to after 5:00 p.m. and on weekends, as faculty members who teach often work online after traditional business hours.

In conclusion, migrating from one LMS to another can be a challenge; but with proper planning and preparation, it can be a smooth and positive experience for the end-user (faculty). IT administrators must plan to incorporate training and support measures into the migration process and do so in a format and at a time that faculty members can take advantage of them. Support from instructional designers is also a key factor that can increase the satisfaction of the faculty member with the change in systems and relieve some stress with course design. Change can sometimes be hard for some people, especially changes of this magnitude, but with proactive administrative support, the experience can be a success.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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