Using Change Management as an Innovative Approach to Learning Management System

Sheri Conklin
University of North Carolina Wilmington
conklins@uncw.edu

Lisa Anne Bove
University of North Carolina Wilmington
bovel@uncw.edu

Abstract

Faculty willingness to adopt new technologies varies depending on the perceived usefulness and ease the technology offers, as well as how the process change is managed (Buchanan, Sainter, & Saunders, 2013). Lewin's Change Management Model was applied to a Learning Management System (LMS) change at a higher education institution to influence the technology change among stakeholders. Data was analyzed to determine the acceptance of the LMS along with change management strategies such as support and communication. At the start of the change, faculty completed a survey describing their comfort with the current LMS. Faculty with a lower comfort level also found the LMS less easy to use (Bove & Conklin, 2019). Another survey was sent to faculty after they transitioned to the new LMS, which focused on comparing comfort level with the type of training the faculty attended. While the new LMS was rated easier to use, there was no significance between faculty comfort with the technology and training attended (Bove & Conklin, 2020). The purpose of this study was to analyze the relationship between change management models and faculty technology acceptance when converting to a new LMS.

Introduction

Learning Management Systems (LMS) are an integral teaching tool in higher education. LMS's provide a means for distributing instructional materials, engaging with learners via discussion boards, and providing feedback to assignments to students both on-campus and at a distance. Many universities have adopted an LMS to facilitate teaching and learning. These technologies are re-evaluated every eight to nine years due to changes in teaching and technology by internal committees (Dahlstrom, Brooks, & Bichsel, 2014). Changes to a university technology system requires project management and change management to achieve successful adoption. Using change management models to facilitate the change can lead to increased adoption and ease of use.

Conceptual Framework of Change

There are many change management models, but one of the most familiar is Lewin's Change Management Model. Lewin (1951) proposed three stages of change referred to as unfreezing, change, and freezing. The three stages are necessary for successful change (Figure 1).
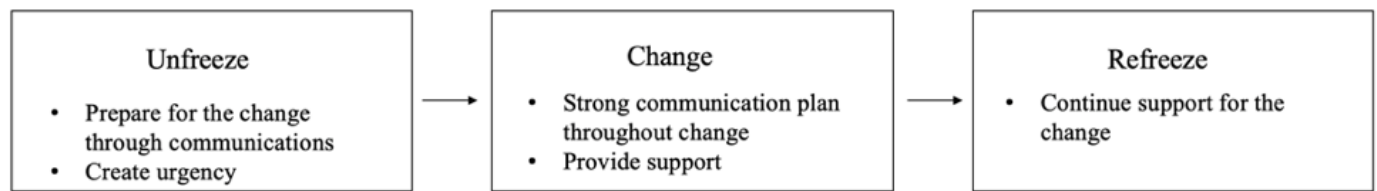
Figure 1. Lewin's Change Management Model

Stage 1: Unfreeze

Stage 1 is the most critical aspect of change since it involves the desire to and/or recognition for change. People are motivated to make a change when there is urgency. This stage involves finding strategies to make it possible for people to let go of an old pattern. Communication is essential during this stage to ensure the proposed changed is understood. Active participation is also an important element of effective change. Often failure of change is related to poor communication coupled with failure to involve affected individuals in the change process (Levasseur, 2001). The communication plan should include both formal communication via email as well as informal communication via hallway conversations and incorporated into training and support sessions to clearly articulate the message (Butt, Naaranoja, & Savolainen, 2016). Support is needed to assist in dialogue, education, and personal development to facilitate the desired change and minimize barriers.

Stage 2: Change

In stage 2, people become 'unfrozen' in their previous ways and move toward change. This stage is the most difficult since people typically resist change. During this period of growth and exploration, support must be provided as well as continued communication with all affected individuals. Individuals who feel actively involved are more likely to support the implementation of the change (Lee, 2006). During this time, the change agents along with upper administrators and leadership, need to provide visionary leadership that enables the process of change rather than top-down approach which can inhibit change (Kotter, 2012). Visionary leadership can assist with maintaining the momentum crucial to the change phase (Levaseur, 2001).

Stage 3: Refreeze

Stability is essential for stage 3. Individuals need support and incentive to remain motivate and ensure compliance. Ongoing education and communication are essential for stability. One of the most important factors when refreezing is continued support. Along with support (Lewin, 1951), there needs a commitment from leadership to remain actively involved (Levaseur, 2001).

Application of Lewin's Change Model
By applying Lewin's Change Management Model, the University planned an LMS transition in order to reduce faculty resistance to the new technology. In stage 1, the evaluation committee of faculty and staff reviewed the LMS options. The committee was informed of the need for change by the University in order to move to a cloud system and reduce down-time. Once the committee made a choice, the project leads developed a communication plan.

Communication was sent to all stakeholders regarding the change and why the change was necessary. The team met with individual program leaders and stakeholders to communicate the change and gather input on the timeline and support needed for each specific program. Thus, methods of communication used included face-to-face meetings, emails, department meetings, faculty senate meetings, and campus news. All university faculty, staff, and students had access to the full evaluation report to ensure all stakeholders had access to the change plan and the reason for

the change.

During the change stage, all faculty could access the new LMS and choose whether they wanted to move to the LMS early in the academic year or later. Faculty had the opportunity to attend training through a variety of modalities, including one-on-one appointments, campus-wide group and/or through customized face-to-face departmental training. Within each modality (e.g., one-on-one or group training), instructors could receive training either face-to-face or via web conferencing tool. For example, if an instructor requested a one-on-one appointment, they could also request to meet online. The support was designed to meet the needs of all faculty since some faculty teach from a distance. All trainings were offered frequently throughout the change. Also, during this time, multiple communications were sent out: to departments, campus-wide newsletters, and programs regarding the trainings and again emphasizing the reason for the change.

During the refreeze stage, training and one-on-one support continued to be offered to all faculty and staff. During the initial migration, 24/7 support was purchased to facilitate additional support. Additional professional development was offered to support both technical and pedagogical approaches for using the LMS. Some specific topics included the following: authentic assessments, best practices for tests and quizzes, and a showcase of fully designed courses so new faculty could see a final product. By offering a range of professional development, faculty with various technology levels and abilities had the opportunity to choose a training specific to their needs.

Technology Acceptance
Technology acceptance is based on the end user's perception of how easy it is to use and how useful it is to their work. The Technology Acceptance Model (TAM) has provided the theoretical basis for empirical studies of user technology acceptance, and predictions of end-user acceptance of an e-learning system (Arbaugh, 2002; Davis et al., 1989; Fathema & Sutton, 2013; Lee, Hsieh, & Hsu, 2011; Maicana, Cazanb, Lixandroiu, & Dovleac, 2019; Rucker & Frass, 2017; Scherera, Siddiqb, & Tondeurc, 2019; Wu, Tsai, Chen, & Wu, 2006). TAM factor analysis provides support for the content and construct validity of the subscales of usefulness (10 items) and ease of use (10 items) and consistently demonstrated acceptable results (King & He, 2016). TAM was designed to apply to any specific domain of human-computer interactions (Davis et al., 1989). TAM postulates that the two main constructs, perceived usefulness and perceived ease of use, determine technology acceptance and are key antecedents of behavioral intentions to use information technology. Perceived usefulness is the "degree to which an individual believes that a particular system would enhance job performance" (Davis, 1989, p. 320). Perceived ease of use is the "degree to which an individual believes that using a particular system would be free of effort" (Davis et al., 1989, p. 320). Perceived usefulness or "usability" varies depending on the area in which it is being studied. Technology integration is not dependent on just availability, but rather how the technology is embraced and utilized by the end user (Fathema, Shannon, & Ross, 2015).

Methods

Participants
Three electronic surveys were sent to all faculty who were identified by the Registrar's office as teaching Fall 2019 semester courses, both online and face-to-face. The survey was sent to the same faculty in Spring 2019 and again in Spring 2020. Participation in all the surveys was voluntary, and participants who were already teaching on the new LMS in the Fall 2019 semester were excluded from the initial survey but were included in the subsequent surveys.

Design
A description survey design was used in this study. The survey was sent a year after faculty had transitioned to the new LMS.

Procedure

Participants were emailed a survey link to the voluntary, anonymous electronic pre/post surveys using Qualtrics TM survey tool. The email included a description of the purpose of the survey, methods to maintain confidentiality, and their role in the study. The survey link was open for two weeks in Spring 2020 to gather feedback on the transition process and LMS training events. During the survey period, participants received an initial email, a reminder 13 days later, and a second reminder immediately prior to the end of the data collection period.

Survey questions included fill-in style for years teaching and radio button choices for title, rank, type and number of courses, comfort level, the need to transition to online due to Covid-19, how they learned about the transition, and the type of training completed on the new LMS. Likert scale questions were used to capture information about the change process, and the ease of use and usability variables based on Davis' Technology Acceptance Model (Davis, 1989). Two final open-ended questions allowed participants to tell the researchers about any issue or concerns they had with the transition. The data were collected anonymously, and with limited identifying characteristics such as years teaching, faculty rank, and experience teaching online. Survey results were compared only in aggregate. Data were maintained on a university owned, password protected PC. IRB approval was received from the institution of record.

Responses were uploaded into IBM SPSS v25 for qualitative analysis. Open-ended questions were analyzed for themes using Nvivo 12. Data were then shared with the LMS migration team in order to plan for ongoing training.

Results
Both quantitative and qualitative data was analyzed from the survey results.

Quantitative Analysis

Survey respondents included faculty across ranks including professors (N=53, 25%), associate professors (N=39, 18%), assistant professors (N=31, 15%), and lecturers (N=85, 40%). Most participants (N=168, 79%) taught full time. Participants had an average of 17 years teaching, with an average of 6 years teaching online. Most participants identified themselves as competent (N=67, 32%) or proficient (N=106, 50%) teaching online. Only 8% (N=17) reported that they did not have any training prior to the transition. Participants reported they learned of the migration in numerous ways, with departmental email (N=155, 73%) being the most popular method. When we compared faculty reported usability, a significance difference was found between those who did not attend some form of training ($M = 29.94$, $SD = 11.42$) and those who did ($M = 24.41$, $SD = 9.33$), $t(210) = -2.30$, $p = .02$. When we comparing faculty reported ease of use, no significance was found between those who did not attend some form of training ($M = 31.06$, $SD = 3.69$) and those who did ($M = 31.28$, $SD = 2.03$), $t(210) = -0.46$, $p = 0.65$. See Table 1 for details. A one-way between subjects ANOVA was conducted to compare usefulness scores based on participant's rated comfort with the LMS. There was a significant difference in usefulness scores for the different groups determined by rating, [$F(4, 206) = 12.54$, $p = .001$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for faculty who self-rated as "novice" ($M = 34.79$, $SD = 9.59$) was significantly different than those who self-rated as "competent" ($M = 26.49$, $SD = 7.30$), "proficient" ($M = 21.98$, $SD = 9.33$), and "expert" ($M = 16.33$, $SD = 6.69$). A significant difference in usefulness score was also found between those who indicated a score of "advanced beginner" ($M = 30.95$, $SD = 9.68$), and those who self-rated as "proficient" ($M = 21.98$, $SD = 9.33$), or "expert" ($M = 16.33$, $SD = 6.69$). See Table 1 for participant details.

Table 1: *Participant Details*

Variable	Range of Variation	N	%
Comfort Teaching On line	Novice	14	6.60%
	Advanced beginner	20	9.43%
	Competent	67	31.60%
	Proficient	106	50.00%
	Expert	9	4.25%
	Did not answer	1	0.47%
Type of training (could select many)	Had no Canvas Training	17	8.02%
	Participated in Canvas Development	23	10.85%
	Participated in Departmental Training	50	23.58%
	Used Canvas Previously	9	4.25%
	Used Canvas Guides	109	51.42%
	Participated in one-on-one Training	93	43.87%
	Participated in an Asynchronous Course	14	6.60%
	Participated in Campus-wide Training	97	45.75%
How were you informed about the change? (could select many)	University Newsletter	91	42.92%
	Departmental Email	155	73.11%
	Countdown Ticker in Previous LMS	116	54.72%
	During a Meeting	70	33.02%
	Word of Mouth	110	51.89%
	Campus Flyer	26	12.26%
	Did Not Answer	10	4.72%

Due to the timing of this survey, we also found that seventy-eight percent (N=166) of participants had to convert one or more of their classes to online format during this semester due to the Covid-19 pandemic. An Independent Sample t-test comparing individuals who had online teaching experience prior to Covid-19 versus individuals who did not and their score on the usability measure was completed. A significant difference was found between mean usability scores for individuals who taught online prior to Covid-19 ($M = 24.22$, $SD = 9.024$) and those who did not ($M = 33.86$, $SD = 12.99$), $t (13.90) = 2.73$, $p = .02$. An Independent Sample t-test was also completed to look at total ease of use scores for the same group, but no significant difference was found between those with prior experience ($M = 31.06$, $SD = 3.47$) and those who did not ($M = 31.79$, $SD = 92.94$), $t (210) = 0.77$, $p = .44$.

Qualitative Analysis
Faculty were asked what assisted them with the migration and what could have been done better. This question also asked faculty to focus on the migration process not the actual LMS. Three major themes emerged from the data: communication, support, and training. Training was further broken down into departmental/small group training, one-on-one training, online training, and suggestions for training.

There were nineteen references made regarding communication. Nine of the comments reference good communication. For example, one faculty stated, "Clear communication and e-learning support. Transition was great. No suggestions for improvement." Another faculty stated, ". . . the training and communication offered were excellent." Yet, ten of the comments referenced confusion regarding why the change was happening. One faculty stated, ". . . I can't see any good reason for the switch." Another faculty stated, "There was almost no communication regarding why Canvas was selected for the transition." And a third faculty mentioned, "The system is generally good. But why was the change needed? It looked like one of those things where – as seems often in the

computer world – changing systems is said to equate to improvement."

Support was another theme mentioned multiple times. Most of the comments regarding support were positive. One faculty stated, "I felt sufficiently prepared after attending a training session. I think [University] provided more than enough resources to help faculty learn the new LMS with plenty of time to prepare prior to the transition." Another faculty stated, "There were so many workshops, 1:1 trainings, etc. offered, which were extremely helpful. I knew that there was always someone I could ask if I was having trouble."

There were also multiple references made regarding the training offered. Faculty made positive comments related to the type of training they attended and what worked best for them. One faculty referenced departmental training by saying "Having departmental training in advance as well as knowing in advance of the transition allowed me to learn the system before actually have to use it for classes." There were seven comments that referenced one-on-one training. This type of training was the most positive. "One on one appointments with [instructional designer] was the most helpful. She helped me tailor the tools to my courses rather than using random examples." A part-time lecturer stated, ". . . I relied on one to one training once I knew I would be working. That assistance was greatly appreciated."

There were also multiple suggestions for improving the migration process which all focused around training. Some faculty requested short videos or PDF's of the essential features. "Better short videos on specific topics." A pdf with annotated screenshots instructors can download and save for reference would be helpful for such task." [reference copying quizzes]. "Elearning could put out a very basic brochure on the absolute basics with information on creating a list of assignments and then creating a page to go with that." One faculty stated that faculty time is a challenge, "Unfortunately, some of us are scheduled so tightly that we cannot always take advantage of services until it is late in the game." While another faculty stated, "More effort to make simple quick instruction available (not more training sessions – the time it takes is a sore point for many) would improve the overall experience for everyone using Canvas."

Other suggestions were made regarding face-to-face training. Many of these suggestions referenced ensuring the trainings matched the audience. For example, one faculty stated that "I attended two "workshops" for faculty, but the Canvas instructor whipped through the how-tos very quickly, kept saying how simple it was, and left all of us old timers in the dust." Another faculty stated, "The workshop I attended was too short to be useful." A third faculty offered the suggestion to view fully design courses. "More time to design and more examples of well-designed courses. Most content was moved over from [the previous LMS] but it was just a long list of items. I thought that was how it was to be designed when that was not design. I just didn't know what it should or could look like."

Discussion
Communication is an essential component of change management processes; it is evident from the responses that communication should focus on why the change is happening. The change of the LMS was communicated to the faculty in Phase one upon completion of the pilot and the report was made available to all faculty. Yet, in Phase two of "unfreezing" the focus of the communication shifted from 'why' the change was happening to the timeline of the change and how to change. Based on data analysis, communication focusing on why the change is necessary, should be continued throughout the entire process of the change including during the refreezing stage. Continued communication of why the change is occurring will result in trust from the stakeholders and reduce conflicting interpretations (Kerzner, 2009). Changes of this magnitude are very disruptive and time consuming for the stakeholders, therefore; continually reminding the stakeholders of why the change is necessary along with how to navigate the change and provide support is essential.

Although training and support can be synonymous, support in this case is the ability to meet the diverse needs of the faculty by providing multiple modes of training to meet the technical ability and time constraints of faculty. Another aspect of support is providing timely responses to questions as well as having knowledgeable trainers. When migrating to a new system, often the University is learning together but it is important to have trainers who have expertise to ensure credibility among the stakeholders and provide timely answers to questions.

Finally, although there were multiple opportunities for faculty to participate in training in various formats, recognizing the diverse technical abilities and time of faculty is important. The creation of just in time materials (e.g., short brochures, short topics, job aids) to assist those who need materials to solve a specific problem. In the refreezing stage, it is important to maintain continued support and training particularly as the stakeholders become more proficient with the technology. It was decided after the change occurred that 24/7 support would continue to be provided. This support assisted faculty with continued support. Evidence of use of support has been noted that the on-campus team received over 1600 help tickets during the Fall 2019 semester and Canvas support also receive over 1600 help tickets.

Limitations
While all online faculty had transitioned to the new LMS, due to Covid-19 all faculty needed to beginning teaching online Spring 2020. The survey was sent as scheduled, but some faculty who responded were new to online training. No training was required for any faculty, but additional training was added for those who needed to transition their courses due to the pandemic.

Conclusion
When planning large scale technology changes, using a change management model will assist with ensuring acceptance among the stakeholders. Lewin's Change Management Model is a flexible framework that does not include prescriptive steps to follow and allows the change management team to base their decisions regarding communication, support and training on the stakeholders. There were a few lessons learned from this migration to the new LMS. Although there was constant communication with the stakeholders regarding the change, the focus of the communication shifted from Stage 1 to Stage 2. In order to ease the anxiety of a major technology change, continually reminding the stakeholders of why the change was happening would have assisted with easing the questions regarding the unknown. This message could be delivered both in writing and incorporated into all training sessions to maximize the efficiency of the message. The utilization of a change management framework that encompasses a strong communication plan and support system can assist with users with technology change.

References

Arbaugh, J. B. (2002). Managing the on-line classroom: a study of technological and behavioral characteristics of web-based MBA courses. *Journal of High Technology Management Research, 13*, 203-223.

Boggs, C., & Van Baalen-Wood, M. (2018). Diffusing Change: Implementing a University-Wide Learning Management System Transition at a Public University. In *Leading and Managing e-Learning* (pp. 115-128). Springer, Cham.

Bove, L, Conklin, S. (April (2nd Quarter/Spring) 2020). Learning Strategies for Faculty During a Learning Management System Migration. *Online Journal of Distance Learning Administration, 23*(1).

Bove, L., Conklin, S. (October (4th Quarter/Autumn) 2019). Using the technology adoption model to assess faculty comfort with the learning management system. *Online Journal of Distance*

Learning Administration, 22(3).

Buchanan, T. Sainter, P., & Saunders, G. (2013). Factors affecting faculty use of learning technologies: Implications for models of technology adoption. Journal of Computing in Higher Education, 25 (1) .1 – 11. DOI: 10.1007/s12528-013-9066-6.

Butt, A., Naaranoja, M., & Savolainen, J. (2016). Project change stakeholder communication. *International Journal of Project Management*, *34*(8), 1579-1595.

Dahlstrom, E., Brooks, D. C. & Bichsel, J. (2014). The current ecosystem of learning management systems in education: Student, faculty, and IT perspectives. Research report. Louisville, CO: ECAR. http://www.educause.edu/ecar.

Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, *13*(9), 319-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical model. *Management Science, 35*(8), 982-1003.

Dahlstrom, E., D. C. Brooks, & J Bichsel. (2014). The current ecosystem of learning management systems in higher education: Student, faculty, and IT perspectives. Research report. Retrieved from http://www.educause.edu/ecar.

Fathema, N., Shannon, D., & Ross, M. (2015). Expanding The Technology Acceptance Model (TAM) to Examine Faculty Use of Learning Management Systems (LMSs) In Higher Education Institutions. *Journal of Online Learning & Teaching*, *11*(2).

Fathema, N., & Sutton, K. (2013). Factors influencing faculty members' Learning Management Systems adoption behavior: An analysis using the Technology Acceptance Model. *International Journal of Trends in Economics Management & Technology*, 2(6), 20-28.

Freire, L., Arezes, P., Campos, J., Jacobs, K., & Soares, M. M. (2012). A literature review about usability evaluation methods for e-learning platforms. *Work 41*, 1038-1044. doi: 10.3233/WOR-2012-0281- 1038

Gautreau, C. (2011). Motivational factors affecting the integration of a learning management system by faculty. *Journal of Online Educators, 8*(1), xxx-xxx

Kerzner, H., (2009). *Project Management: A Systems Approach to Planning, Scheduleing and Controling*. John Wiley & Sons, New Jersey.

King, W. & He, J. (2016). A meta-analysis of the technology acceptance model. *Information & Management*, 43, 740–755.

Kotter, J. P. (2012). *Leading change*. Harvard business press: Boston, MA.

Lee, T. T. (2006). Adopting a personal digital assistant system: application of Lewin's change theory. *Journal of Advanced Nursing*, *55*(4), 487-496.

Lewin, K. (1951). *Field Theory in Social Science*. Harper & Row, New York.

Levasseur, R. E. (2001). People skills: Change management tools—Lewin's change model. *Interfaces*, *31*(4), 71-73.

Jaschik, S. & Lederman, D. (2014). The 2014 Inside Higher Ed Survey of faculty Attitudes on Technology: A Study by Gallup and Inside Higher Ed. Washington, DC: https://www.insidehighered.com/news/survey/online-ed-skepticism-and-self-sufficiency-surveyfaculty-views-technology.

Lee, Yi-Hsuan, Hsieh, Yi-Chuan & Hsu, Chia-Ning. (2011). Adding Innovation Diffusion Theory to the Technology Acceptance Model: Supporting Employees' Intentions to use E-Learning Systems. *Journal of Educational Technology & Society*, *14*(4), 124-137.

Maicana, C., Cazanb, A., Lixandroiu, R., & Dovleac, L. (2019). A study on academic staff personality and technology acceptance: The case of communication and collaboration applications. *Computers & Education*, 128, 113–131.

Rafi, A., Samsudin, K., & Hanafi, H. F. (2015). Differences in Perceived Benefit, Use, and Learner Satisfaction between Open Source LMS and Proprietary LMS. In *E-Learning-Instructional Design, Organizational Strategy and Management*. IntechOpen.

Rucker, R. & Frass, L. (2017). 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*, *46*(2), 259-277.

Ryan, T., Toye, M., Charron, K., & Park, G. (2012). Learning management system migration: An analysis of stakeholder perspectives. *International Review of Research in Open & Distance Learning*, *13*(1), 220–237.

Pajo, K. & Wallace, C. (2001). Barriers to the Uptake of Web-based Technology by University Teachers. *The Journal of Distance Education*, *16*(1), 70-84.

Panda, S., & Mishra, S. (2007). E-Learning in a Mega Open University: Faculty attitude, barriers and motivators. *Educational Media International*, *44*(4), 323-338. doi: 10.1080/09523980701680854.

Scherera, R., Siddiqb, F., & Tondeurc, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education*, 128, 13–35.

Wu, J. P., Tsai, R. J., Chen, C. C., & Wu, Y. C. (2006). An integrative model to predict the continuance use of electronic learning systems: Hints for teaching. *International Journal on E-Learning*, *5*(2), 287-302.

Back to the Online Journal of Distance Learning Administration Contents