Strategic Approaches to Increase Course Management System Adoption by Higher Education Faculty

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The literature suggests multi-causal reasons for low levels of faculty adoption of course management systems (CMSs), and this paper proposes a strategic approach to increase faculty adoption of CMSs. First, challenges to faculty CMS adoption and how faculty willingness to complete CMS training influences CMS adoption will be discussed. Next, research indicating that faculty perceptions of CMS compatibility with their teaching style affects CMS training completion, and likely has a secondary impact on CMS adoption, will be reviewed. Lastly, recommendations for targeting faculty with teaching styles less compatible with CMS use and improving their compatibility will be given.

INTRODUCTION

Although online course management systems (CMSs), such as Blackboard (Blackboard, Inc., 2016), have been available to higher education faculty for approximately 20 years (Empson, 2012), challenges still prevent universal adoption by faculty for teaching and learning (Straumsheim, Jaschick, & Lederman, 2015). This is a problem because faculty and higher education administrators agree that educational technology contributes to higher-quality teaching and learning as evidenced by a recent survey conducted by Straumsheim et al. (2015), in conjunction with Gallup. They surveyed a sample of 21,399 faculty and 885 technology administrators who worked in the public, private, and for-profit sectors, and found that the majority of faculty and technology administrators say that educational technology use results in improved student learning outcomes, and 84% of technology administrators and 63% of instructors believe that university spending on educational technology is warranted because of advances in student learning.

The scientific literature suggests that the reasons for persistent low levels of faculty adoption of educational technology (including CMSs) are multi-causal. These reasons include lack of training, knowledge, and practice (Dutta, Roy, & Seetharaman, 2013; Straumsheim et al., 2015); negative perceptions (Al-Senaidi, Lin, & Poirot, 2009; Ertmer & Ottenbreit-Leftwich, 2010; Onyia & Onyia, 2011; Pereira & Wahi, In Press); time constraints (Al-Senaidi et al., 2009; Kenney & Newcombe, 2011; McKissic, 2012; Yidana, Sarfo, Edwards, Boison, & Wilson, 2013), poor infrastructure (Al-Senaidi et al., 2009; Aremu, Fakolujo, & Oluleye, 2013; Yidana et al., 2013), and incompatible teaching styles (Pereira & Wahi, In Press).

This paper will recommend a strategic approach for targeting faculty with teaching styles that are less compatible with CMS use and improving the compatibility of their teaching styles with the CMS to increase CMS adoption rates. Increased CMS adoption rates will contribute to higher quality teaching and learning at higher education institutions, resulting in improved student learning outcomes.

FACULTY CMS ADOPTION ISSUES

The literature indicates that CMS use by higher education faculty for teaching and learning increases the quality of teaching and learning (Simon, Jackson, & Maxwell, 2013; Tsai & Talley, 2013; Yidana et al., 2013). Additionally, in a survey of United States public, active, degree granting higher education institutions, Allen and Seaman (2016) found that 71.4% of academic leaders believe that online education learning outcomes are the same or superior to in-person instruction.

Nevertheless, many faculty are slow to adopt technology, including CMSs, or use it at low levels (Abrahams, 2010; Bothma & Cant, 2011; Straumsheim, Jaschick, & Lederman, 2015; Unwin et al., 2010). For example, while Straumshem (2015) found the majority of faculty (77%) "always" provide students with syllabus information via a CMS, far fewer faculty, "always" use it to provide e-textbooks and related material (33%), track student attendance (22%), identify students who may need extra help (16%), and integrate lecture capture (13%). Straumsheim et al. also revealed that faculty who have instructed an online class use CMSs at higher levels than faculty who have never taught an online class, especially in regards to communicating with students (59% those who instructed online, 37% those who have never instructed online) and recording grades (72% those who taught online, 47% those who have not taught online).

Also contributing to CMS adoption issues, Allen and Seaman (2016), who surveyed United States public higher education institutions for the past 12 years, found that over that time-period the amount of distance education courses and programs have increased. However, chief academic officers believe that faculty acceptance of online learning has not similarly increased. They reported that over this 12 year time-period, at most only one-third of chief academic officers perceived that faculty within their institutions "accepted the value and legitimacy of online education" (p. 6). Allen and Seaman also revealed that the percentage in the latest survey (29.1%) was less than the rate reported in 2004. Not surprisingly, chief academic officers at institutions with no distance education offerings have the most negative views of their faculties' acceptance of the value and legitimacy of online learning, only 11.6%.

INCREASE FACULTY TRAINING TO INCREASE CMS ADOPTION

Studies suggest that faculty technology training on a CMS increases their adoption of the CMS. For instance, deNoyelles, Cobb, and Lowe (2012) revealed that faculty favored transitioning to an online training program using their institution's CMS, and the faculty perceived they were more adept at developing online courses at the end of the training. McBride and Thompson (2011) reported that faculty who completed a training workshop on Moodle, a CMS, were more willing to use Moodle after the workshop than before the workshop.

Porter (2011) asserted that new faculty should complete CMS training if they have class sizes greater than 100. He found that classes were more organized when faculty utilized a CMS's administrative functions. In addition, Hixon et al. (2012) analyzed the effect of faculty online training and decided that training participation influenced the development program impact.

However, many faculty are not willing to complete training on educational technology (Hassan, 2011; Hurtado et al., 2012), including CMS training (Pereira, 2015). For example, Pereira (2015), who surveyed faculty at a public university in the northeastern United States, found that although CMS training was offered to faculty "on demand" in an online format and regularly (weekly) in an in-person format, the majority of faculty did not attend either type of training over the 12 month time-period prior to the survey. Faculty unwilling to complete CMS training will likely either not use the CMS or use it at low levels in

the classroom, fostering missed opportunities to enhance teaching and learning and improve student learning outcomes.

FACULTY TRAINING AND ADOPTION RESISTANCE MAY OWE TO TEACHING STYLE INCOMPATIBILITY

In a recent study of factors that influence faculty to complete technology training on their institution's CMS, Pereira and Wahi (Pereira & Wahi, In Press) asked faculty respondents to rate their perceptions of the relative advantage, compatibility, complexity, trialability, and observability of the CMS, which was Blackboard, and their willingness to complete CMS training. Controlling for other factors, only compatibility was significantly associated with willingness to complete training on the CMS, both online and in-person training modalities. These results suggest that faculty who are willing to train on the CMS already find the CMS compatible with their teaching style.

Similarly, the literature indicates that faculty are more likely to adopt an educational technology if they perceive it is compatible with their teaching style. For example, Tabata and Johnsrud (2008) found that faculty are more willing to teach distance education courses if they perceive it fits with their working styles. This is in agreement with other researchers who asserted that faculty who believe web-based education is consistent with their teaching values and techniques are more willing to integrate web-based methods (Ajjan & Hartshorne, 2008; Sayadian, Mukundan, & Baki, 2009).

Therefore, it may be possible that the reason faculty have not universally adopted the CMS is because it is not compatible with their teaching style. To elicit whether there are any associations between faculty demographic characteristics and perceived compatibility of the CMS with their teach style, Pereira and Wahi (2016, October) surveyed 102 public university professors in the northeastern United States. They measured the following demographic characteristics: age (in age groups), gender (male, female, other), rank (instructor, assistant professor, associate professor, and full professor (called "professor")), tenure status (full-time tenured, full-time tenure-track, full-time and part-time non-tenure-track), and department (Science, Technology, Engineering, and Math [STEM], Social Science, Economics, History, and Political Science [SEHP], Education, Communications, Game Design [ECG], and other departments including Business Administration, English Studies, Industrial Technology, Interdisciplinary Studies, and Nursing). They also measured how long faculty used the CMS and their self-reported level of expertise. Faculty perceptions of the CMS were measured using subscales developed by Keesee (2010) from the CMS Diffusion of Innovations Survey instrument.

Pereira and Wahi (2016, October) found significant statistical correlations between faculty department, rank, and CMS length of use with faculty perceptions of compatibility of using the CMS with their teaching style. Faculty who taught in the department category "other" (included Business Administration, English Studies, Industrial Technology, Interdisciplinary Studies, and Nursing) expressed a lower-level of compatibility of the CMS with their teaching style than faculty in other department categories. Conversely, faculty who taught at the instructor or assistant professor ranks were more likely to believe the CMS is compatible with their teaching style than faculty in higher ranks (associate professor and professor). Finally, Pereira and Wahi's results suggest that the number of years faculty use the CMS positively influences their perception of its compatibility with their teaching style.

IMPORTANCE OF IDENTIFYING FACULTY WITH INCOMPATIBLE TEACHING STYLES

Given that the literature suggests that faculty whose teaching styles are not compatible with using technology are less likely to attend training on and adopt the technology, including CMSs, it is important for university administrators to identify faculty who have a teaching style that is incompatible with using technology for teaching and learning. To that end, studies suggest that faculty within certain fields feel less compatible using educational technology and teaching online. For example, Button, Harrington, and Belan (2014), who reviewed the literature related to information communication technology and online learning in nursing education, reported challenges related to using technology and logistical issues

including having the time to create an online course. They also asserted that the literature suggests nursing faculty need training in educational technology use as well as how to facilitate online instruction. Additionally, as described in the prior section, Nursing Department educators were part of the group of faculty who expressed low compatibility with using their institution's CMS in a study conducted by Pereira and Wahi (2016, October).

The literature also suggests that faculty within the field of Business Administration may have teaching styles not compatible with online training. These include a recent study conducted by Pereira and Wahi (2016, October), detailed in the prior section, and an earlier study conducted by Roberts, Walker, and Kelley (2007) who explored the level to which Accounting faculty incorporate educational technology within their introductory accounting courses. Roberts et al.'s survey revealed that 90% of the Accounting faculty had never used a video web-based system and 70.5% had never collaborated with students using a web-based system. Faculty within other disciplines that may have teaching styles incompatible with technology, in particular with a CMS, are English Studies, Industrial Technology, Interdisciplinary Studies (Pereira & Wahi, 2016, October).

Another group that may have teaching styles incompatible with technology use and the online learning environment are tenured faculty and those at higher ranks (e.g., associate and full professors). This is supported by research conducted by Pereira and Wahi (2016, October) who found that faculty who taught at these ranks were less likely to perceive the CMS is compatible with their teaching styles than faculty in lower ranks (instructor and assistant professor). In addition, the Higher Education Research Institute at the University of California, Los Angeles reported that professors and associate professors incorporate online homework and discussion boards less frequently than instructors and assistant professors (Eagan et al., 2014). Also, because instructors and assistant professors are generally younger than higher ranks, their post-secondary instructions may have been delivered via online resources. As a result, they may have earned some or all of their post-secondary degrees via online resources, leading them to higher perceptions of compatibility with these resources and their teaching styles.

Finally, research suggests there is a positive correlation between the number of years faculty have used a CMS and their belief that it fits with their teaching style (Pereira & Wahi, 2016, October), and that educational technology self-efficacy impacts technology adoption by faculty (Al-Senaidi, Lin, & Poirot, 2009; Ertmer & Ottenbreit-Leftwich, 2010; Onyia & Onyia, 2011). Therefore, those who are new to teaching, have used the CMS on a limited basis, or do not have a background in online teaching may be another group whose teaching styles are incompatible with CMS use.

HELP FACULTY ADOPT TEACHING STYLE COMPATIBLE WITH ONLINE TEACHING

Helping faculty whose teaching styles are incompatible with using the CMS learn ways to incorporate the CMS into their current teaching styles and adopt new teaching styles compatible with online teaching may make them more willing to both train on and adopt the CMS. One way to accomplish this is to use faculty training and support to create a sense of connection between faculty members who teach in online programs. After interviewing online faculty and their adult students, Boiling, Hough, Krinsky, Saleem, and Stevens (2012) asserted that when faculty are encouraged to collaborate with other faculty, they can better understand new technologies, discuss ideas, and learn from each other.

Faculty who are not experienced with teaching online or using a CMS may find it difficult to develop interactive courses. In their survey, Boiling et al. (2012) found that most students taking online classes preferred interactive online courses that integrated multimedia, rather than online courses that primarily offered text-based content, little communication with others, and individualized instruction. Faculty who have taught only or primarily in-person may also find it difficult to "connect" with their students in an online course. Students feel disconnected with classmates and faculty in online courses if there is no or little interaction with others (Boiling et al., 2012).

The literature suggests that one way to help faculty foster connection and community with students and build more interactive online courses is to provide them with training on how to incorporate social media into their online instructional practices (Hung & Yuen, 2010; Junco, Heiberger, & Loken, 2011;

Roebuck, Siha, & Bell, 2013; Wankel, 2009). For example, Roebuck, Siha, and Bell (2013) surveyed faculty who used social media for teaching and learning and found that, notwithstanding gender or rank, respondents agreed that the advantages of using social media include multiple sources for student comments, information sharing, improved student engagement, stronger classroom community, and better-quality discussion opportunities and student collaboration. Junco, Heilberger, and Loken (2011) also revealed that the use of Twitter communication, a social networking and microblogging application, fostered student and faculty engagement in a first-year seminar course for pre-health majors; and, Wankel (2009) described how faculty can use different social media platforms, such as Facebook, blogs, YouTube, and Twitter, to facilitate strong collaboration among management education students.

Research also suggests that training faculty on the use of podcasting will help them obtain a personal connection with each student in an online environment, also necessary for good teaching. Forbes et al. (2012) conducted a qualitative case study of an online faculty education course and reported that podcasting improved emotional and interpersonal connections in an online class.

Faculty whose teaching styles are not compatible with using a CMS or teaching online may also need training on how to help students develop the skills they will need for their future careers. This is because faculty may not understand how to offer demonstrations and provide themselves as role models for skill-based learning outcomes in an online modality. Podcasting is one technique that has been found to work cultivate technical skills as well as the self-confidence students need for their educational careers (Forbes et al., 2012).

Faculty uncomfortable with online teaching may feel apprehensive if asked to move to this environment. Paul and Cochran (2013) suggested that one way to relieve this apprehension is to provide these faculty with instructional designers who have expertise in designing and teaching online courses. According to Paul and Cochran, trained instructional designers are vital to faculty because they can partner with faculty to discuss pedagogical issues and help them create portions of their course content, while letting faculty focus on their subject knowledge.

As well as instructional designers, faculty with teaching styles incompatible with using a CMS may benefit from technology training resources (Paul & Cochran, 2013). De Gagne and Walters (2009) synthesized online education qualitative literature and found that faculty who are more prepared technically devote more time to teaching their courses than focusing on the technical components of online learning.

CONCLUSION

A strategic approach to increase adoption of CMSs in higher education faculty is to target those faculty whose teaching styles are less compatible with the CMS and provide them with supportive training to translate their teaching styles to the online setting. Once this is done, these faculty should be more willing to complete traditional training on the CMS, and will be more likely to adopt it for teaching and learning, resulting in improved student learning outcomes.

Faculty who have been shown to have teaching styles less compatible with CMS use and online learning, and, thus should be sought out for training, are those who teach in departments including Nursing, Business Administration, English Studies, Industrial Technology, and Interdisciplinary Studies. Other groups that may also have teaching styles incompatible with CMS use and online learning, and may require extra support, are faculty who are tenured, at higher ranks (associate and full professors), have never used a CMS or used it for a short time-period, and have reported perceptions of low technology self-efficacy.

The literature suggests that this training for faculty with teaching styles incompatible with CMS use or online learning should be in areas such as developing interactive courses, fostering community within the online classroom, incorporating social media and podcasting in instruction, developing students' skills, as well as helping faculty who teach in the online environment connect with each other. Researchers also suggest that formal training should be augmented with the use of instructional designers and technology training resources.

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