An Examination of the Strengths, Weaknesses, Opportunities, and Threats Associated with the Adoption of Moodle™ by eXtension

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Abstract: The use of technology to deliver programming across Extension has been addressed widely; however, little research has been conducted concerning the use of Moodle™ as a course management system for Extension. The purpose of the study reported here was to identify the strengths, weaknesses, opportunities, and threats associated with the use of Moodle™ as an educational tool in eXtension from the perspective of those currently using the system. Findings reveal specific elements affecting the adoption of Moodle™ across eXtension that should be addressed in order to encourage further diffusion.

Introduction

The use of technology to deliver programming across Extension has used methods such as online conferencing (Murphrey & Coppernoll, 2006), online professional development (Senyurekli, Dworkin, & Dickinson, 2006), and even the Internet as an opportunity for education (Tennesen, PonTell, Romine, & Motheral, 1997). In fact, multiple studies focus on Extension educators' interest in the concept of online learning. Many individuals still do not fully understand what eLearning is or know how to participate in an online learning experience (Williamson & Smoak, 2005; Edwards, McLucas, Briers, & Rohs, 2004; Tennesen, et al., 1997).

Studies focusing on the use of Moodle™ as a course management system for education have been documented by several sources (Martín-Blas & Serrano-Fernández, 2009; Romero, Ventura, & García, 2007; Chavan & Pavri, 2004); however, little research has been conducted concerning the use of Moodle™ as a course management system for Extension education. eXtension is an Internet-based educational partnership of Extension units across the United States that provides access to objective research-based information and learning opportunities (eXtension, 2010). eXtension adopted Moodle™ as a Course Management System in 2007. While some Extension personnel and clients are adopting the use of eLearning delivery systems like Moodle™, it is not known what elements are affecting the adoption and what steps could be taken to increase adoption.

Theoretical Framework

The theoretical framework for the study reported here was based upon the diffusion of innovations. According to Rogers (2003), "The innovation-decision process is the process through which an individual (or other decision making unit) passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision" (p. 216). Rogers (2003) stated, "*Diffusion* is the process in which an innovation is communicated through certain channels over time among members of a social system" (p. 5). It is important to first understand the diffusion process in order to understand the factors that affect adoption. Further, perceptions of an innovation's attributes can clarify and explain an innovation's rate of adoption. Rogers (2003) listed those attributes as, (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability.

Purpose

The purpose of the study was to identify the strengths, weaknesses, opportunities, and threats (SWOT) associated with the use of Moodle™ as an educational tool in eXtension from the perspective of "very active" and "active" course instructors using eXtension Moodle™ websites.

Methodology

The qualitative study reported here was conducted via personal interviews in an effort to gain deeper understanding due to the opportunity to ask follow-up questions. While a survey was considered, it was determined that survey methodology would not provide the information sought and that a survey would best be conducted as a follow-up study. In addition, the study was conducted 2 years following implementation of the content management system in order to allow adequate time for users to interact with the system in-depth in order to provide valuable feedback.

Interviews were conducted both face-to-face and via telephone depending on the preference and availability of the interviewee. The overarching goal of each interview was to identify strengths, weaknesses, opportunities, and threats associated with the use of Moodle™ as an educational tool in eXtension from the perspective of active users in an effort to identify elements impacting adoption. According to Goodstein, Nolan, and Pfeiffer (1993), a SWOT analysis "â™¦involves an in-depth, simultaneous study of both theâ™¦internal *strengths* and *weaknesses* and those significant factors outside the organization that may positively or negatively impact its future, the external *opportunities* and *threats* confronting the organization" (p. 226).

The study used the SWOT analysis approach in an effort to obtain valuable information that could guide future efforts. Upon completion of each interview, the respondents were asked to review the interviewer's notes for accuracy and report any discrepancy in an effort to facilitate triangulation. As data was gathered, respondents were coded, and the researcher reviewed interview transcripts for overlapping themes. Themes emerged from the data and were placed into the predetermined categories of strengths, weaknesses, opportunities, and threats. In order to establish a logical ranking of the emergent themes the researcher used Fraenkel and Wallen's (2009), "â™¦common way of interpret[ing] content analysis data through the use of frequencies (i.e., the number of specific incidents found in the data)" (p. 480).

The purposive sample for the study consisted of "very active" and "active" course instructors using eXtension Moodle™ websites. "Very active" was defined as individuals who had accessed a Moodle™ course recently and at least 10 or more times between January and July of 2009. "Active" was defined as individuals who had logged in recently and at least three or more times between January and July of 2009. Due to the fact that eXtension and Moodle™ were in the early stages of adoption, there were only a limited number of individuals who fit these descriptions. A total of nine individuals across the United States were interviewed. According to Cresswell (2008), homogeneous sampling is a purposive sample based upon membership in a subgroup with defining characteristics. The defining characteristics of the sample were determined by using individual activity report data. The individuals who had logged in recently and frequently over an extended period of time, classified as "very active" or "active," were determined to be the most appropriate sample for the study. For the purpose of the study, the term "Extension educator" refers to any Extension employee.

Findings

Analysis of the transcripts of the individuals interviewed revealed 15 emergent themes regarding the use of Moodle™ as an educational tool in eXtension. These themes were divided into the predetermined SWOT categories: strengths, weaknesses, opportunities, and threats. Findings were ranked in order of importance based initially on the number of respondents who mentioned the theme and secondarily by the number of times mentioned by respondents in total. In addition, each theme was assigned to one of the innovation attributes as defined by Rogers (2003) and noted in parentheses following each theme.

Strengths

Five primary categories related to strengths of Moodle™ use by Extension educators (Table 1). These categories included aspects of Moodle™ specifically and eLearning in general.

Table 1.
Respondents' Comments Regarding Strengths of Moodle™ Use for eXtension

Strength			

	Number of Respondents	Number of Times Mentioned by Respondents
Moodle™ is an easy to use (Complexity), cost effective, malleable platform with many development tools built in. (Relative Advantage)	9	36
Extension educators were favorable toward eLearning.(Compatibility)	9	9
Online learning reaches new or hard to reach clientele for Extension. * (Compatibility)	3	5
Current technical support in place by eXtension is valuable to the support of Extension educators.(Complexity)**	3	4
Online learning provides a versatile platform for many different types of learners.(Compatibility)	2	3
*Note: The ability to reach new audiences was expressed as both a strength and an opportunity. **Note: Technical support was expressed as both a strength and a threat.		

Weaknesses

There were two major weaknesses identified in the study (Table 2). The first weakness related to the nuances of Moodle™ as a Course Management System. The second weakness related to Moodle™ courses and the site not being identifiable as an eXtension initiative and not receiving eXtension marketing exposure.

Table 2.
Respondents' Comments Regarding Weaknesses of Moodle™ Use for eXtension

Weakness	Number of Respondents	Number of Times Mentioned by Respondents
Nuances of Moodle™ as a Course Management System require a learning curve by Extension educators. (Complexity)	6	9
Moodle™ is not readily identifiable as an eXtension initiative and does not receive the marketing exposure of other eXtension initiatives. (Observability)	3	6

Opportunities

Four categories emerged in regard to opportunities: marketing efforts, reaching audiences, quality curriculum development, and the use of online learning as a funding source (Table 3).

Table 3.
Respondents' Comments Regarding Opportunities for Moodle™ Use for eXtension

Opportunity	Number of Respondents	Number of Times Mentioned by Respondents
The ability of eXtension to market Moodle™. (Observability)	4	7
Extension educators see online learning as a mechanism to reach new and hard to reach audiences. * (Compatibility)	3	4
eXtension producing quality curriculum causing people to look to eXtension as a resource. (Observability)	2	2
The possibility of online learning becoming a funding source for Extension efforts. (Relative Advantage)	2	2
*Note: The ability to reach new audiences was expressed as both a strength and an opportunity.		

Threats

Four categories related to threats emerged (Table 4). Threats included the inherent changing of technology, lack of recognition for eLearning efforts, technology support needs, and lack of marketing exposure.

Table 4.
Respondents' Comments Regarding Threats of Moodle™ Use for eXtension

Threat	Number of Respondents	Number of Times Mentioned by Respondents
The evolution of technology will change in ways that cannot be predicted.(Complexity)	6	7
	4	6

Extension community and culture does not encourage and nurture online learning through rewards and recognition.(Compatibility)		
The possibility that there will not be enough technical support in place to help Extension educators. * (Complexity)	1	1
eXtension not providing the marketing exposure necessary.(Observability)	1	2
** Note: Technical support was expressed as both a strength and a threat.		

Conclusions, Implications, and Recommendations

Based on findings and Rogers' innovation-decision process, it can be concluded that Extension educators interviewed for this study have proceeded fully through three steps of the process: knowledge, persuasion, and decision. Currently, the Extension educators interviewed are in the implementation phase and putting the innovation to use. eXtension must acknowledge the final stage of confirmation, which is where "the individual seeks reinforcement for an innovation-decision already made but may reverse the decision if exposed to conflicting messages about it" (Rogers, 2003, p. 216-217).

eXtension's sustained engagement and support of the Moodle™ platform has the potential to affect the continued diffusion and adoption of online learning in a broad sense across Extension nationally via eXtension efforts. As indicated in the themes that emerged from the interviews, Moodle™ as an innovation is perceived to have "relative advantage" and "compatibility," while at the same time there was evidence of "complexity" and lack of "observability." It is important to note that the characteristic of "trialability" was not addressed by the respondents. In order to increase the diffusion of Moodle™ in eXtension, it is recommended that steps be taken to increase opportunities for individuals to try out the platform.

Based on findings, there are several elements affecting the adoption of Moodle™ across eXtension. Positive elements affecting the adoption of Moodle™ included: access to technical support; ease of use; favorable attitude toward eLearning; and recognition of use and application.

Negative elements affecting the adoption of Moodle™ included: need for continuous technology training; inherent changing of technology; lack of marketing exposure; and lack of scholarly recognition for eLearning efforts. In order to increase the adoption of Moodle™, steps should be taken to address negative elements and build off positive elements.

The strengths revealed in the study reported here suggest that Extension educators who use Moodle™ as a part of eXtension have a positive view of online learning. These individuals identified Moodle™ as an easy platform to use for developing and delivering online learning to various audiences and described online learning as a way to reach new or hard-to-reach Extension clientele. These individuals held the perspective that online learning is a versatile form of learning for many different learner types. Based on these findings, it can be concluded that Moodle™ is an appropriate platform for the individuals using it. It is recommended that eXtension continue to encourage and support Extension educators in their online learning efforts. However, it is also recommended that research be conducted that includes individuals who have chosen not to adopt Moodle™ in an effort to further understand the diffusion process and identify potential issues.

Findings revealed numerous opportunities for eXtension associated with the Moodle™ platform that included opportunities for increased marketing efforts, audience reach, development of quality curriculum, and the development of new funding sources. Based on findings, growth of the eXtension community will require marketing the concept and practice of Moodle™. In addition, it is recommended that research be conducted to establish strategies to address the interest in using Moodle™ as a means of income for eXtension and other Extension entities.

eXtension is currently using Moodle™ as the Course Management System of choice, but respondents recognize that technology is ever changing and expressed that the changing of technology is unsettling. While change is inevitable, it is recommended that drastic changes not be made to the type or style of the Course Management System eXtension currently has in place.

Respondents mentioned that online learning is not generally the supported or encouraged form of education in Extension. eXtension, as an organization, should recognize this mindset as a barrier to the use of eXtension and look for ways to encourage adoption of eLearning across Extension. Based on recent findings by Franz, Piercy, Donaldson, Westbrook, and Richard (2010), "[T]hey [farmers] believe Extension needs to more often use farmers' preferred methods of learning in delivering educational programs, including a larger on-line presence." An awareness of learner preferences should be balanced with available resources and teaching methods.

Involvement in eXtension is not a requirement for advancing the use of Extension eLearning at the individual and/or state level. The authors see evidence that activities are taking place across Extension that advance eLearning outside of eXtension. It is also recognized that not all Extension groups or individuals are necessarily supportive of eXtension. The study reported here sought to identify the strengths, weaknesses, opportunities, and threats as articulated by those actively engaged in use of the course management system adopted by eXtension. It is recommended that future studies examine eXtension and eLearning in Extension on a national scale in order to determine factors that affect participation and to determine strategies to encourage adoption.

In addition, it is recommended that additional research be conducted with a larger population of eXtension participants to allow generalization of future findings. Research findings reveal that there is a need for Extension professionals to use the services provided by eXtension, and thus Extension administration is encouraged to provide training on the use of eXtension applications and recognize eXtension as both a tool for professional development and as a means of reaching diverse audiences. Varied efforts across Extension will determine the overall impact of eLearning in the future, and the adoption and diffusion of Moodle™ in eXtension is one part of a much larger picture.

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