E-Learning Course Characteristics and User Satisfaction

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Abstract - **The goal of the reported research was to study the effect of course characteristics on e-learning user satisfaction. The research took place in the context of a workplace training course at an industrial manufacturing firm in Thailand. A user satisfaction survey was used to evaluate the performance of the e-learning system across the firm (n = 278). The survey collected data on system characteristics and user satisfaction. SEM was used to determine the effects of characteristics including user interface, learning community, system content, personalization, and system operation on e-learning user satisfaction. Analysis showed that user interface, learning content, system content, and system operation had a significant positive effect on user satisfaction with the e-learning system. However, personalization did not have a significant effect on user satisfaction. The implication of this research is that e-learning course and system designers do need to focus on their system characteristics to ensure user satisfaction and ultimately achieve learning goals.**

Keywords - **E-Learning, User Satisfaction**

I. INTRODUCTION

The purpose of this research was to examine the effects of e-learning system characteristics on user satisfaction with a workplace e-learning course. E-learning systems, or systems that use the Internet or standalone computing systems or apps as the main training platform, are widely used in workplace training and development for anything ranging from brief introductory knowledge transfer prior to on-the-job training to in-depth continuing education and advanced training purposes (Clark & Mayer, 2016). The increasing affordability and accessibility of e-learning platforms has made them a popular choice for large and small firms around the world (Yoo, Han, & Huang, 2012). E-learning systems provide the opportunity for consistent training and efficient distribution of knowledge, although learning quality can be a concern (Derouin, Fritzsche, & Salas, 2005). Reduced cost of implementation for e-learning systems and integration of new technologies like social media have reduced some of the barriers that were observed early (Cheng, et al., 2014; Clark & Mayer, 2016). Thus, e-learning is an accepted organizational tool today, which provides a significant benefit for the organization.

However, it is less well understood how workers benefit in the context of organizational e-learning. This research examines the development of user satisfaction in the context of a large Thai manufacturing firm.

II. LITERATURE REVIEW

User satisfaction can be defined as "an affective state representing an emotional reaction to the usage of a technology (Cho, Cheng, & Lai, 2009, p. 220)." In addition to the emotional or affective state implied by

Cho, et al. (2009) user satisfaction can also have a cognitive basis in evaluation of how well the system has met the user's needs (Wang, Wang, & Shee, 2007). User satisfaction is relevant to the effectiveness of e-learning because it facilitates knowledge transfer (Shee & Wang, 2008; Siritongthaworn & Krairit, 2006). However, the antecedents of user satisfaction with e-learning on internal communication, like most other aspects of internal communication, have been poorly studied (Verčič, Verčič, & Srirahmesh, 2012).

Authors have identified a range of factors contributing to user satisfaction with e-learning systems in general, such as system characteristics and system quality, individual learner characteristics, and course design and instructor characteristics (Sun, Tsai, Finger, Chen, & Yeh, 2008; Wang, Wang, & Shee, 2007). This research focuses on system characteristics, rather than learner or course characteristics.

There have been several previous studies that have identified system characteristics that influence user satisfaction (Shee & Wang, 2008; Siritongthaworn & Krairit, 2006; Wang, 2003). Shee and Wang (2008) and Wang (2003) identified four dimensions, including the system's user interface, learning community, system content, and system operation. Siritongthaworn and Krairit (2006) had a broader set of factors, which included system operation, content delivery and facilitation of communications.

However, these characteristics can be seen as very similar to those identified in the previous studies. Other authors have incorporated these dimensions into broader aspects such as user experience or system characteristics, but still considered issues such as content and user interface, along with the ease of communication and formatoin of a learning community (Ardito, et al., 2006; Bhuasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012). From these studies, a set of five dimensions of the e-learning system can be identified. These dimensions include:

- *User Interface:* ease of use, user friendliness, and ease of understanding of the user interface;

- *Learning Community:* ease of communication, interaction, and knowledge sharing between learners and instructors;

- *System Content:* up-to-date, accurate, relevant, and easily accessible course content;

- *Personalization:* Ability to control and monitor course performance;

- *System Operation:* System stability, reliability, and speed (Ardito, et al., 2006; Bhuasiri, et al., 2012; Shee & Wang, 2008; Siritongthaworn & Krairit, 2006; Wang, 2003; Wang, et al., 2007).

These five dimensions of the e-learning system have been demonstrated in the reviewed studies as having a positive effect on user satisfaction with the e-learning system. Based on this body of research surrounding the characteristics of e-learning systems and their effects on user satisfaction, the following hypotheses are proposed:

- *Hypothesis 1:* The user interface has an effect on user satisfaction.

- *Hypothesis 2:* The learning community has an effect on user satisfaction.

- *Hypothesis 3:* The system content has an effect on user satisfaction.

- *Hypothesis 4:* Personalization has an effect on user satisfaction.

- *Hypothesis 5:* System operation has an effect on user satisfaction.

III. METHODS

The research was conducted as a survey of users of a newly implemented e-learning system at a manufacturing firm in Thailand, who were following an organization-wide course on internal communication (n = 278). Data was collected using an online survey which was distributed via an all-staff email list

following the conclusion of the course. The survey collected data on system characteristics and user satisfaction. Analysis was conducted using structural equation modelling (SEM) in SPSS AMOS.

IV. RESULTS AND DISCUSSION

A. Results

The fit of the structural model developed from SEM was adequate ($\chi 2$ = .655, p = .601; CFI = .96, RMSEA = .055). The main concern for this research is the regression effects, which demonstrate the relationships between variables. Regression results (Table I) demonstrate that there were significant regression effects of four factors, including UI, LC, SC, and SO. All of the observed effects were positive. Learning Community (LC) had the highest standardized coefficient, indicating the strongest effect on User Satisfaction (US). This was followed by System Content (SC), System Operation (SO), User Interface (UI), and Personalization (P). Thus, Hypotheses 1, 2, 3, and 5 can be accepted, but Hypothesis 4 is rejected.

B. Discussion

This study supported the significance of e-learning system characteristics, including the learning community, system content, system operation, and the user interface, on the user's satisfaction with the learning system. This finding is broadly consistent with previous studies, which have also demonstrated that these factors significantly influence the user experience and contribute (or detract from) their satisfaction (Ardito, et al., 2006; Bhuasiri, et al., 2012; Shee & Wang, 2008; Siritongthaworn & Krairit, 2006; Wang, 2003; Wang, et al., 2007). The main notable difference is that personalization was not shown to be significant. However, personalization of the e-learning system has only been included by a few other authors (Shee & Wang, 2008; Wang, 2003). Although Shee and Wang (2008) did find it to be significant, it is possible that their learning environment or context differed in design or intent from that of the current study. Since the current research took place in the contex tof a work-based

learning environment it is possible that learners were not placing as much value on tracking or controlling progress through what was essentially an informational course. This study has demonstrated that the technical characteristics of an e-learning system can have a significant impact on user satisfaction with their experience with the system itself. Since user satisfaction does contribute to knowledge transfer (Cho, et al., 2009), it is important for the system's design to reflect the needs of the user, especially by providing the learning community and content they need for learning.

V. CONCLUSION

This study has demonstrated the importance of the design of the e-learning system for ensuring user satisfaction and ultimately, knowledge transfer. This is a critical concern for organizations that are using their e-learning systems to facilitate knowledge transfer and improve internal communication between their staff members, as at the case company used here.

However, there are still many characteristics of e-learning systems whose effects on the learner's experience are poorly understood. Many such systems may still suffer from poor design characteristics which impede formation and use of learning communities and inhibit users from accessing quality content, either because of the design of the system or the course design. Furthermore, although it was not studied here it is very likely that system characteristics do interact with user characteristics, which could change the way in which these systems work. Thus, there are still many opportunities to expand the research on e-learning systems and their implementation in the workplace training environment.

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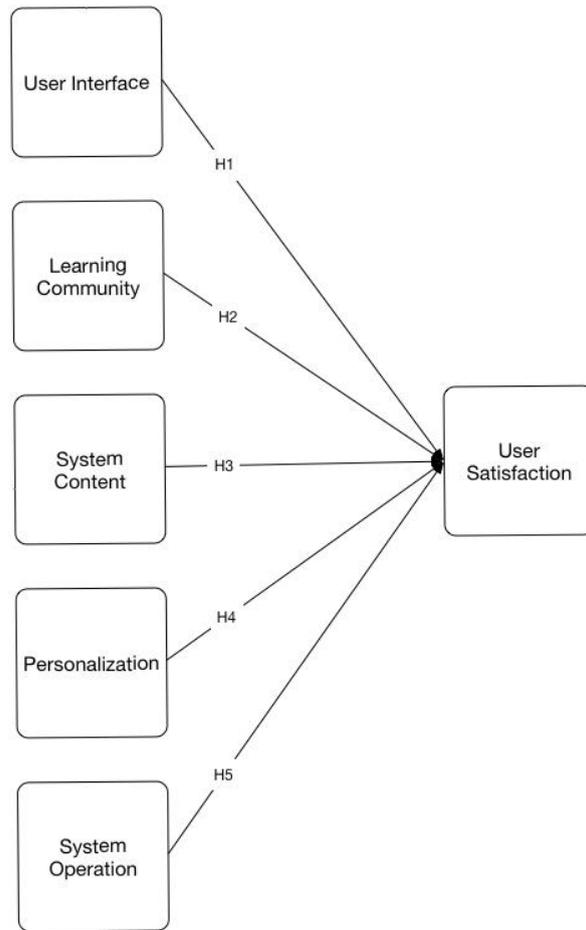
Fig. 1 Conceptual Framework

TABLE I
REGRESSION OUTCOMES

Relationship	Standardized Coefficient	T-test	
		T-value	**P (Sig.)**
US ← UI	.381	3.22	.003
US ← LC	.545	6.73	<.001
US ← SC	.502	5.95	<.001
US ← P	.072	1.31	.108
US ← SO	.418	3.99	<.001