Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses

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ABSTRACT

Student satisfaction is important in the evaluation of distance education courses as it is related to the quality of online programs and student performance. Interaction is a critical indicator of student satisfaction; however, its impact has not been tested in the context of other critical student- and class-level predictors. In this study, we tested a regression model for student satisfaction involving student characteristics (three types of interaction, Internet self-efficacy, and self-regulated learning) and class-level predictors (course category and academic program). Data were collected in a sample of 221 graduate and undergraduate students responding to an online survey. The regression model was tested using hierarchical linear modeling (HLM). Learner–instructor interaction and learner–content interaction were significant predictors of student satisfaction but learner–learner interaction was not. Learner–content interaction was the strongest predictor. Academic program category moderated the effect of learner–content interaction on student satisfaction. The effect of learner–content interaction on student satisfaction was stronger in Instructional Technology and Learning Sciences than in psychology, physical education or family, consumer, and human development. In sum, the results suggest that improvements in learner–content interaction yield most promise in enhancing student satisfaction and that learner–learner interaction may be negligible in online course settings.

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1. Introduction

According to the 2010 Sloan Survey of online learning, approximately 30% of university and college students take at least one course online (Allen & Seaman, 2010). Most studies of online education found no significant differences in learning outcomes when compared to traditional, classroom-based education (e.g., Allen, Bourhis, Burrell, & Mabry, 2002; Biner, Bink, Huffman, & Dean, 1997; Brown & Liedholm, 2002; Johnson, Aragon, Shaik, & Palma-Rivas, 2000). However, online courses differ considerably from traditional instruction in the way students interact with the instructor, their fellow students and the content. Interaction would be very limited without the utilization of appropriate technologies in fully online learning settings. Limited interaction may in turn decrease students' course satisfaction and affect their performance (Chang & Smith, 2008; Noel-Levitz, 2011). Learners with high levels of interaction with the teacher and other learners are more engaged in online learning (Veletsianos, 2010).

In contrast to traditional learning environments, online learning requires learners to be confident in performing Internet-related actions

and be willing and able to self-manage their learning process (Sun & Rueda, 2012; Tsai, Chuang, Liang, & Tsai, 2011). Learners with low confidence in the use of the Internet may be less engaged in the learning activities and have fewer opportunities to interact with the instructor or classmates, thus leading to dissatisfaction with online learning (Liang & Tsai, 2008; Tsai et al., 2011). Moreover, online learning allows learners with more freedom to participate in the learning process or interact with the classmates. Therefore, their ability to regulate and monitor their own learning progress is critical. Learners who cannot regulate their learning process efficiently may experience dissatisfaction that leads to less engagement during online courses (Sun & Rueda, 2012).

2. The importance of student satisfaction

Studies examining cognitive learning outcomes (e.g., effectiveness of distance courses and student achievement) are common in distance education (Barnard, Paton, & Lan, 2008; Edvardsson & Oskarsson, 2008; Offir, Bezalel, & Barth, 2007; Wadsworth, Husman, Duggan, & Pennington, 2007). However, affective aspects such as student attitudes are equally important. In the late 1990s, Biner, Welsh, Barone, Summers, and Dean (1997) contended that of the attitudinal constructs, student satisfaction is worthy of investigation because it is critical to

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academic achievement. More recently, Palmer and Koenig-Lewis (2012) also called for the study of affective variables in technology-enhanced environments. Chang and Smith (2008) and Noel-Levitz (2011) indicated that post-secondary students who are satisfied are more likely to be successful. Student satisfaction, which reflects how positively students perceive their learning experiences, is an important indicator of program- and student-related outcomes (Biner et al., 1997; Liao & Hsieh, 2011). For example, student satisfaction is associated with program quality, student retention, and student success in program evaluation (Debourgh, 1999; Koseke & Koseke, 1991). High student satisfaction can lead to lower drop-out rates, higher persistence, and greater commitment to the program (Ali & Ahmad, 2011; Allen & Seaman, 2003; Debourgh, 1999; Koseke & Koseke, 1991; Noel-Levitz, 2011; Reinhart & Schneider, 2001; Yukselturk & Yildirim, 2008). Considering these potential benefits, student satisfaction should be studied to increase retention and recruitment of future students. In addition, student satisfaction enables institutions to target areas for improvement and facilitates the development of strategic planning specific to online learners (Noel-Levitz, 2011). In this study, we investigate factors impacting student satisfaction by taking into account course differences.

3. Factors contributing to student satisfaction

Interaction has been consistently identified as an important predictor of student satisfaction (Ali & Ahmad, 2011; Bolliger & Martindale, 2004; Bray, Aoki, & Dlugosh, 2008; Dennen, Darabi, & Smith, 2007; Lee, 2012; Sahin, 2007; Yukselturk & Yildirim, 2008). The framework of this study is based on Moore and Kearsley (1996) three types of interaction, with the addition of Internet self-efficacy, self-regulated learning, and additional factors (i.e. course category and program) that impact student satisfaction in online learning (Artino, 2007; Chu & Chu, 2010; Chu & Tsai, 2009; Peterson, 2011; Puzziferro, 2006; Rodriguez Robles, 2006).

3.1. Interaction

Interaction is important in all forms of education, regardless of whether technology is involved (Moore & Kearsley, 1996). Traditionally, interaction focuses on classroom-based communications between the instructor and students (Anderson, 2003). The attributes and resources of the Internet and the World Wide Web (WWW) expand the capacity of online learning. One unique feature of online learning is its capacity to support interactive group processes (Jain, 2011). Interaction allows learners to link pre-existing knowledge with new information and make new meaning through analysis or integration (Juwah, 2006). The effective use of technology with proper pedagogy enhances the interactive process between students and instructors or content in online learning (Jain, 2011). Interaction is related to the quality of online learning (Han & Johnson, 2012), online collaborative learning (Kim & Lee, 2012; Rosmalen et al., 2008), low attrition (Juwah, 2006), and effectiveness of online learning (Lee, 2012; Nandi, Hamilton, & Harland, 2012).

The transactional distance theory describes interaction (Moore, 1989). Expanding on examination of physical separation alone, Moore (1989) postulated distance as a pedagogical phenomenon that involves the procedures taken by teachers, learners, and organizations to overcome the geographic distance. The concept of transaction was first proposed by Dewey (1916), and it takes into account the interplay among the environments, the individuals, and the behaviors. Transactional distance exists in any educational events, including face-to-face environments as well as distance environments. If there is a learner, a teacher, and a communication channel, then some transactional distance exists. The most prominent framework of interaction in distance education includes three major aspects: learner–instructor interaction, learner–learner interaction, and learner–content interaction (Moore, 1989).

Expanded from Moore's model, other forms of interaction in on-line learning were proposed such as learner–interface interaction (Gunawardena, Lowe, & Anderson, 1997), learner–tutor interaction (Juwah, 2006), learner–designer interaction (Juwah, 2006), learner–task interaction (Herrington, Reeves, & Oliver, 2006), learner–tool interaction (Hirumi, 2011), and vicarious interaction (Sutton, 2001). Although there is a wide range of proposed interactions, this study will focus on the three types of interaction from Moore. Learner–learner and learner–instructor interactions are learner–human interaction while learner–content interaction is learner–non-human interaction (Hirumi, 2011).

Learner–instructor interaction refers to a two-way communication between the instructor of the course and learners (Moore & Kearsley, 1996). It can take many forms, such as guidance, support, evaluation, and encouragement (Moore, 1989). Learner–learner interaction involves a two-way reciprocal communication among learners, with or without the presence of an instructor. By interacting with fellow students, students can exchange ideas with and get feedback from each other (Anderson, 2003; Moore, 1989). Student interest and motivation can be enhanced through peer interaction using asynchronous or synchronous tools (Moore, 1989). Engaging in peer interaction propels students to construct ideas deeply, and increases achievement (Anderson, 2003).

Learner–content interaction refers to a one-way process of elaborating and reflecting on the subject matter or the course content (Moore, 1989). Interaction of learners with content initiates an internal didactic conversation, which happens when learners talk or think to themselves about the information, knowledge, or ideas gained as part of a course experience. Through an internal conversation learners cognitively elaborate, organize, and reflect on the new knowledge they have obtained by integrating previous knowledge (Moore, 1989; Moore & Kearsley, 1996).

Various forms of interaction have been recognized as important factors in promoting student satisfaction within online learning environments (Bernard et al., 2009; Bray et al., 2008; Burnett, 2001; Eom, 2009; Juwah, 2006; Moore & Kearsley, 1996; Northrup, Lee, & Burgess, 2002; Thurmond & Wambach, 2004) although some disagreements persist. Sher (2004) proposed that learner–instructor interaction and learner–learner interaction are significant contributors to satisfaction. Yukselturk and Yildirim (2008) indicated that learner interaction with peers decreased throughout the learning process but learner interaction with instructors remained the same in a study with online learners from Turkey. Some research indicated that learner–instructor interaction is the best predictor of course satisfaction (Battalio, 2007; Bolliger & Martindale, 2004; Thurmond, 2003). Thurmond (2003) found learner–instructor interaction to be the most significant predictor of student satisfaction in a study involving undergraduate and graduate students participating in web-based nursing courses. Similarly, Bolliger and Martindale (2004) found learner–instructor interaction to be the most important factor impacting student satisfaction in a sample of graduate students enrolled in multiple online instructional technology courses in a regional university. Battalio (2007) described learner–instructor interaction as the only required interaction in student learning.

Other research on online learning indicated that interaction among learners is more strongly predictive of learner satisfaction than the amount of learner interaction with the instructor (Jung, Choi, Lim, & Leem, 2002; Rodriguez Robles, 2006). For example, Jung et al. (2002) found that undergraduate students in a collaborative interaction group had higher satisfaction than the other two groups. Rodriguez Robles (2006) had the same finding among adult learners. Interaction among learners enhances satisfied experiences when an interactive course was offered (Lee & Rha, 2009). However, too much required collaboration among learners reduces student satisfaction (Berge, 1999; Bray et al., 2008). It seems unclear whether and under which circumstances these interaction dimensions play a role in predicting student satisfaction.