Full length article

Escape from infinite freedom: Effects of constraining user freedom on the prevention of dropout in an online learning context

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ABSTRACT

Online learning involving Massive Online Open Courses (MOOC) is often used to avoid the physical limitations of offline learning. In addition, educational equality can be achieved by redistributing sunk costs in the online context. However, the dropout rate represents a serious and avoidable waste of economic resources. Numerous researchers have conducted studies on the subject, the large majority of whom outlined possible causes of the dropout phenomenon rather than offering solutions to reduce the dropout problem in e-learning. To remedy this, we propose practical system features to counteract the dropout rate in online learning. Through original use of psychological reactance theory (Brehm, 1966) as our main theoretical framework, we make two suggestions: restricting accessibility and limiting repeatability of online courses. These two measures create a sense of scarcity and lack of control, which may help to reduce dropout rates. In an experiment using our e-learning prototype, we analyzed data collected through a survey/questionnaire and interviews with subjects after the experiment. The results indicate that the perception of scarcity and lack of control in the online learning context may enhance e-learners' concentration and increase their intention to continue and engage more deeply in online learning.

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1. Introduction

Online learning (e-learning/distance learning) refers to an educational method in which electronic tools and information technology are used to deliver educational content and experiences (Moore & Kearsley, 2011). Since the Internet is used as a delivery channel, online learning shares many characteristics with the Internet: openness, accessibility, and interactivity (Young, 1998, 1999). Online learning provides learners with opportunities to overcome the spatiotemporal limitations of conventional learning, allowing them to access educational content at their convenience (Cole, 2000). In addition, e-learning has the advantage of providing content based on the level and objectives of the learner with the advantages of spontaneity and active involvement (Anderson, 2008).

From a wider perspective, online learning reduces the social and personal costs of education and increases the cost effectiveness of resources used in education (Moore & Kearsley, 2011). Online learning can hence be considered a high value-added industry, and its continued development is therefore an important topic. Many schools and firms are already investing resources in the development of online learning services, as they view online education as a viable alternative to conventional education and all its aforementioned limitations (Wang, Wang, & Shee, 2007).

These days, however, despite the popularity of ICT technology, the resources required to provide online learning remain considerable. Not only must infrastructure (computers, hardware, and software) be taken into consideration, but also related training, maintenance, internet access, the cost of copyright, creation of learning materials, and localization of materials for different cultures and contexts (Njenga & Fourie, 2010). Clearly, online learning is not necessarily cheaper than offline learning. However, many academic institutions and businesses have invested an enormous

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amount to meet their great expectations of online learning.

Despite the clear advantages of e-learning over conventional education, various unfavorable circumstances complicate the situation (Packham, Jones, Miller, & Thomas, 2004;Xing, Chen, Stein, & Marcinkowski, 2016;Yukselturk & Inan, 2006). The main reason for the difficulty is that many people drop out part way through the term without completing their courses (Eisenberg & Dowsett, 1990; Kember, 1989a, 1989b; Narasimharao, 1999; Parker, 1999; Shin & Kim, 1999; Tinto, 1975; Zielinski, 2000). This dropout phenomenon occurs much more frequently in the online learning environment compared to face-to-face education (Breslow et al., 2013; Diaz & Cartnal, 1999; Doherty, 2006; Levy, 2007; Tello, 2007; Xenos, 2004) and has been recognized as the most serious problem in the domain of e-learning services (Ariwa, 2002; Carr, 2000; Diaz, 2002; Frankola, 2001). This problem may be even more severe in the context of the platforms of Massive Open Online Courses (MOOC). Previous studies show that about 90% of MOOC students drop out before completing the courses in which they enroll (Breslow et al., 2013; Hew and Cheung, 2014; Ho et al., 2014; Jordan, 2014). Coursera, a major player of MOOC, presented a report in 2012 indicating that the average completion rate of most courses was very low (e.g., Belanger & Thornton, 2013).

This is a direct example of how severely the dropout phenomenon impacts online learning. The cost of online learning services like MOOC is very high given the significant investment in time, effort, and infrastructure. Chafkin (2013, p. 14) argued that the low completion rates raise concerns of MOOC's effectiveness and about the effectiveness of online learning itself (Marcus, 2013). Many scholars have argued the necessity to reduce the high dropout rates in online learning (Xing et al., 2016). Reduction of dropout rates (i.e., increasing retention rates) is currently a fundamental criterion for the evaluation of e-learning (Terkla, 2001; Higher Learning Commission, 2001).

Many researchers have explored the reasons behind the dropout phenomenon in online learning. For example, Fini (2009) argued that the biggest cause of this problem is the lack of motivation of online learners. Rice (2013) cited insufficient space for discussion among learners and other co-learners or teachers as another possible reason. Murray (2001) stated that the lack of interaction due to the shortage of visual and auditory stimuli may also be a factor. Other researchers identified other reasons, such as students' lack of prior knowledge of the lecture subjects (Belanger & Thornton, 2013), ambiguities concerning assignments or class goals (Young, 2013), and boredom and/or a lack of motivation for continuous involvement in learning (Song, 2004).

Parker (1999) studied the factors that can predict student dropout or success rates in distance learning and concluded that students' personal characteristics (gender, age, work, and working conditions) or locus of control (Dille & Mezack, 1991;Rotter, 2011;Whittington, 1995) can predict their likelihood of dropping out. Through case studies, Chyung, Winiecki, and Fenner (1998) demonstrated how satisfaction with lectures during the first and second week affects students' desire to continue to participate in online lectures. Additionally, the course itself, quality of instructor, and the extent of student support have also been identified as variables that affect dropout rates (Kaye & Rumble, 1981). Furthermore, the possibility of interacting with the lecturer (Whittington, 1995) and the difficulty of the assigned homework (Garg, Panda, & Panda, 1992) have been suggested as factors related to dropping out.

Most of these reasons for dropping out of online courses are related to personal characteristics (Volkwein & Lorang, 1996), surrounding environments, the physical or social situation, and lack of interaction in learning (Rosé et al., 2014; Zheng, Rosson, Shih, & Carroll, 2015,Zheng, Han, Rosson, & Carroll, 2016). However, these factors are unavoidable in the online learning context (lack of interaction, surrounding environments) or are present regardless of the learning medium (personal characteristics, physical/social situations). Therefore, no practical solution for preventing dropout in the online learning context can be suggested based on the prior studies of the reasons for dropping out. Other previous studies have proposed reasons for dropout behavior, but no practical guidelines for designing an e-learning service that retains its participants have been suggested. Drever (2003) not only identified dropout variables, but also insisted that designing a good learning environment for learners is essential. Therefore, future studies should suggest systems, features, and designs that will reduce dropout rates in online learning services.

In this study, we propose that the properties of e-learning, namely its unlimited openness, accessibility, and repeatability, lower learners' perceptions of the value of studying (Xing et al., 2016; Yang, Sinha, Adamson, & Rose, 2013). Additionally, we argue that the increased perception of user control in the online learning context could lead to learners multitasking by using a cell phone or engaging in some other task not relevant to the educational situation, which may distract them and undermine their learning, thereby decreasing motivation. Zheng et al. (2015) conducted qualitative research similar to ours, arguing that the unlimited accessibility of online learning makes users feel a lack of pressure in their study course, and this lack of pressure is one of the factors influencing user dropout.

Based on the findings of this study, we propose that the e-learning usage experience be altered not to include unlimited accessibility and repeatability, so that users perceive higher value from the lecture; these changes may not only increase concentration, but may also increase course completion rate. We intentionally restrict some of the features in the e-learning context. Rather than developing or suggesting new features like previous researchers did, we limit the number of features in order to maximize the advantages of e-learning.

Psychological reactance theory (Brehm, 1966) demonstrates that reactance to a restricted person (such as an instructor) can be manifested either behaviorally (such as by exerting additional effort) or emotionally (such as the desire not to lose the value of learning from the restricted person). Taking advantage of this reactance may increase concentration and reinforce the intangible value of learning. In this study, we examine the concepts of scarcity and lack of control as precedent factors that may increase concentration on lectures and commitment to e-learning. In addition, we create a prototype e-learning platform to conduct our experiment. The results of the experiment show that a learner's perception of restricted freedom can increase concentration on lectures and intention to continue studying.

2. Research model and hypothesis development

2.1. Research model

Before reviewing the previous studies in this area, we present the research model for this study (Fig. 1). As shown below, six hypotheses are represented in the model. In Sections 2.2–2.7, we discuss the theoretical background of each hypothesis.

2.2. Psychological reactance theory

According to psychological reactance theory, when people's freedom is threatened or taken away by somebody else or by some external force, the afflicted crave their lost freedom strongly because their intrinsic motivation to preserve the value of the freedom they had previously enjoyed are induced (Brehm, 1966;