Computers & Education 51 (2008) 1589–1598

Contents lists available at ScienceDirect

Computers & Education

journal homepage: www.elsevier.com/locate/compedu

The role of feedback and self-efficacy on web-based learning: The social cognitive perspective

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ARTICLE INFO

Article history:
Received 24 May 2007
Received in revised form 11 March 2008
Accepted 11 March 2008

Keywords:
Peer feedback
Self-efficacy
Self-regulated learning
Social cognitive theory
Web-based learning
Interactive learning environments
Learning strategies

ABSTRACT

The social cognitive perspective of self-regulated learning suggests that effective learning is determined by the interactions among personal, behavioral, and environmental influences; particularly, high self-regulated learners hold higher motivation (personal), apply better learning strategies (behavioral) and respond to environmental demand more appropriately (environmental). The study thus uses the social cognitive perspective to explore the role of self-efficacy (personal), student feedback behavior, use of learning strategies (behavioral), performance and receiving feedback (environmental) in Web-based learning. There were 76 university students participated in this study. Both quantitative and qualitative methods were applied for data analysis. The results supported that self-efficacy predicted student use of learning strategies and related to elaborated feedback behavior (personal → behavioral). High self-efficacy students applied more high-level learning strategies, such as elaborative strategy and critical thinking. Students who provided elaborated feedback also had higher self-efficacy than those who did not. Moreover, receiving elaborative feedback significantly promoted student self-efficacy (environmental → personal), while receiving knowledge of correct response improved student performance. However, the results indicated that feedback behaviors did not predict academic performance, which may be interfered by modeling effects.

1. Introduction

Recently, Web-based learning has gained more attention in education because it provides students with greater access to information and greater opportunities to work collaboratively with peers without the limitations of time and distance (Palmieri, 1997). However, although Web-based environment provides students with more flexibility to learn, research shows that students who are accustomed to the traditional didactic teaching may have problems to adapt to Web-based learning (McCormack & Jones, 1998). Researchers also identify that learners tend to lack focus, willingness to participate and confidence in Web-based learning (Boechler, 2001; Hansan, 2003). Thus, researchers are attempting to understand how to promote learner motivation and to facilitate learning behaviors in the Web-based learning environment. One important theory that has been noted is the social cognitive theory (Bandura, 1986).

Research has placed emphasis on social cognitive theory in order to understand the relationships between personal, behavioral, and environmental influences (Bandura, 1986, 1997), which help to promote students practices and skills of self-regulated learning (Wang & Lin, 2007a). A recent study proposed a number of significant factors involved in such influences for a social cognitive model of self-regulated learning in the Web-based environment (Wang & Lin, 2007a). However,

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doi:10.1016/j.compedu.2008.03.004

research using the social cognitive model on Web-based learning seldom examines the reciprocal interaction between personal, behavioral, and environmental influences (Compeau & Higgins, 1995; Compeau, Higgins, & Huff, 1999; Wang & Lin, 2007a). This study thus examines reciprocal interactions among these influences in order to better understand students' self-regulated learning in the Web-based environment.

Social cognitive theory suggests that successful self-regulated learners have higher motivation (personal influences), employ better learning strategies (behavioral influences), and respond more appropriately to situational demands (environmental influences) (Pintrich & Schunk, 2002; Wang & Lin, 2007a). The social cognitive perspective on self-regulation plays a very important role in academic learning. According to Wang and Lin (2007a), teachers who recognize the possible reciprocal interactions of these influences will be able to manipulate environmental influences, student perception, and learning behaviors to facilitate student learning. As Bandura (1997) suggested, the relative importance of personal, behavioral and environmental influences would vary for different activities and under different circumstances. The impacts of these influence in Web-based learning needs to be further examined. This study thus investigates the role of self-efficacy (personal), learning strategies, providing feedback (behavioral), performance and receiving feedback (environmental) in the social cognitive model to understand their influences in the Web-based learning environment (see Fig. 1).

2. Personal influence: self-efficacy

The effects of motivation or personal beliefs about learning have been the subject of intense investigation in educational settings, but have rarely been studied in the context of Web-based learning (Tobias, 2006; Yang & Tsai, in press). Some researchers, however, suggest that motivation is even more important in Internet environment (Sankaran & Bui, 2001; Shih & Camon, 2001; Tobias, 2006). For example, research suggests that motivation is the most important student attribute significantly related to Web-based performance (Sankaran & Bui, 2001; Shih & Camon, 2001).

Specifically, research suggests that self-efficacy, or students' beliefs regarding their capability to execute actions necessary to achieve designated outcomes (Bandura, 1986), has a stronger effect on academic performance than other motivational beliefs (Lent, Brown, & Larkin, 1987; Pintrich & De Groot, 1990; Pintrich & Schunk, 1996, 2002). Self-efficacy also has been found to have critical effects on various types of academic learning (Bandura, 1996, 1997, 2000; Gibson, Randel, & Earley, 2000; Joo, Bong, & Choi, 2000; Linnenbrink & Pintrich, 2002; Little & Madigan, 1997; Pajares & Kranzler, 1995; Pajares & Miller, 1995; Pintrich & Schunk, 2002). Recent studies show that self-efficacy is strongly related to Web-based learning and performance (Bolt, Killough, & Koh, 2001; Compeau & Higgins, 1995; Joo et al., 2000; Tsai & Tsai, 2003). For example, research demonstrates that students' self-efficacy in using the internet significantly impacts their Web-based performance (Joo et al., 2000). Tsai and Tsai (2003) also indicate that students with higher internet self-efficacy perform better than those with lower internet self-efficacy in the Web-based learning task.

Research also indicates that self-efficacy has significant influences on self-management behaviors and self-regulated learning processes, such as self-observation, self-judgment and self-reaction (Dembo, 2000; Pintrich & Schunk, 2002; Schunk, 1990, 2001). Research in general suggests that effective self-regulation is based on students' sense of self-efficacy for self-regulating their learning and performing well (Pintrich & Schunk, 2002; Schunk, 1994). In other words, self-efficacy plays important roles in self-regulated learning behaviors. In addition to self-regulated behaviors, research also shows that self-efficacy has a strong influence on effort and task persistence, particularly in the face of the difficulty (Pintrich & Schunk, 2002; Schunk, 1995). In a review of distance learner persistence studies, Gibson (1998) identifies self-efficacy as a key variable. Aside from its effects on persistence and quantity of effort, self-efficacy has also been positively correlated to quality of effort, such as in the use of deeper processing strategies (Pintrich & Schrauben, 1992; Pintrich & Schunk, 2002). A study of internet searching strategies suggested that high internet self-efficacy students apply better information searching strategies than low internet self-efficacy students in a Web-based learning task (Tsai & Tsai, 2003). The aforementioned studies indi-

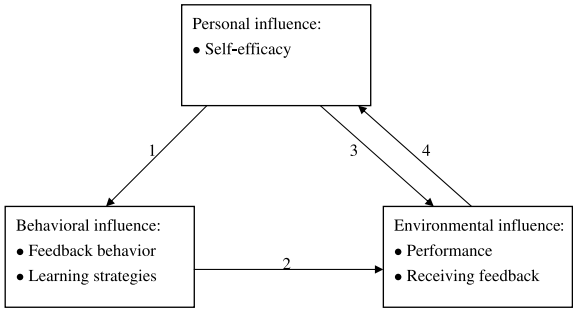

Fig. 1. The personal, behavioral, and environmental influences of the social cognitive model. *Note*: Arrow 1 hypothesizes that self-efficacy should have positive influences on feedback behavior and learning strategies. Arrow 2 hypothesizes that feedback behavior and learning strategies should have significant influences on performance. Arrow 3 hypothesizes that self-efficacy should have significant impacts on performance. Arrow 4 hypothesizes that receiving feedback should have positive impacts on self-efficacy.