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The Dynamics of Social Learning in Distance Education

Sharath Sasidharan
Emporia State University, ssasidha@emporia.edu

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Emporia State University
ssasidha@emporia.edu

ABSTRACT

Distance education through electronic learning (e-learning) technologies has been accepted as a viable knowledge transfer tool by universities; however, it has not provided the learning benefits that were originally anticipated. This study examines the role of individual learner characteristics, goal-orientation beliefs, and social learning in influencing e-learning success. Experimental data was collected from students undergoing online courses. Preliminary results indicate that the learner characteristics of self-regulation and computer-learning self-efficacy, complemented by social learning through the electronic learning network influence e-learning success.

Keywords

E-Learning, Self-regulation, Goal-orientation, Social network.

INTRODUCTION

Distance education is facilitated by a variety of e-learning technologies - this paper considers a learning system having 80% of the content delivered online (Allen and Seaman, 2010). The learner interacts with the online system, applies self-instructional control, and acquires knowledge in an independent, self-paced manner. Knowledge is also acquired through social learning facilitated by electronic ties with other learners. Hence, learner characteristics, beliefs, and the extent of social learning can impact e-learning success.

INDIVIDUAL LEARNER CHARACTERISTICS

Self-Regulation and Self-Efficacy

Self-regulation is the ability of individuals to focus on a task and conceive strategies to meet task objectives while self-efficacy is the belief in one's capabilities to organize and execute courses of action required to produce a given attainment (Zimmerman, 2000). Both have been found to influence classroom learning (Pintrich and DeGroot, 1990; Zimmerman, 2001). E-learning requires the learner to strategize the learning process, apply self-instructional control, and learn from a computerized system; hence self-regulatory skills and computer-learning self-efficacy assume importance.

P1a: *Learner beliefs dealing with the ability to self-regulate learning will positively influence e-learning success.*

P1b: *Learner beliefs dealing with computer-learning self-efficacy will positively influence e-learning success.*

Goal-Orientation Beliefs

Goal-orientation has been an important motivational variable in explaining classroom learning performance (Fisher and Ford, 1998). Goal-orientation has two dimensions: performance-approach and performance-avoidance (Zweig and Webster, 2004). Performance-approach oriented individuals focus on positive outcomes and show proficiency over allotted tasks whereas performance-avoidance oriented individuals have negative perceptions of high-risk activities. The latter group had lower learning outcomes in a classroom environment (Elliot and Church, 1997). Extending this to the e-learning environment,

P2a: *Learner beliefs associated with performance-approach orientation will positively influence e-learning success.*

P2b: *Learner beliefs associated with performance-avoidance orientation will negatively influence e-learning success.*

SOCIAL LEARNING AND DIGITAL LEARNING NETWORKS

Social learning occurs through communication, interaction, and socialization among learners and facilitates the transfer of non-codified, experiential knowledge (Brown and Duguid, 1991). In a classroom, learners acquire knowledge from co-learners through informal interaction and socialization; hence, social learning is inherently embedded in the classroom-

learning experience. E-learning systems facilitate the electronic version of social learning through technology tools such as discussion boards, virtual classrooms, audio/video conferencing and e-mail. Participating in such a "digital" learning network (DLN) would require time and effort; however, it can provide a supplement to the formal knowledge acquired through the course material.

Social Network Analysis (SNA) can be used to understand the structure of the DLN. Formally, a social network is a set of nodes, with each node representing an actor, and a set of ties, with each tie representing a relationship between the actors (Hanneman and Riddle, 2005). The actors and their ties can be represented in the form of a network diagram (Figure 1).

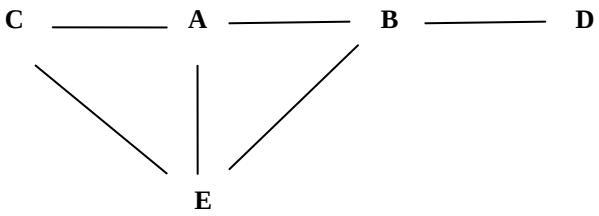

Figure 1: A basic network diagram

Degree-centrality measures the number of direct ties of an actor with other actors – the larger the number, the greater the access to knowledge flows (Brass, 1995). Actors having ties to others who themselves are not connected (called a structural hole) have access to non-redundant knowledge flows. Such actors can merge diverse ideas and form creative solutions to problems (Burt, 2004). Structural holes are measured using betweenness-centrality. In Figure 1, actors A and B have the same degree-centrality; however B has a higher betweenness-centrality than A due a structural hole (i.e. absence of a communication tie) between D and E.

In the DLN, the actors would be the learners, and the relationship ties would be the electronic communication between learners. Learners having greater degree-centrality will have increased access to knowledge flows, hence,

P3a: *Degree-centrality will positively influence e-learning success.*

Learners having greater betweenness-centrality will have increased access to non-redundant knowledge flows, hence,

P3b: *Betweenness-centrality will positively influence e-learning success.*

A preliminary study was conducted using data collected from students who had undergone online courses facilitated by an e-learning system.

RESEARCH METHODOLOGY

Data Gathering

Data was collected from students undergoing identical sections of an online course delivered using Blackboard. There was no course activity that required mandatory communication between students; however, they were encouraged to have course discussions via e-mail. Upon completion of the course, students completed a questionnaire that measured their individual characteristics and mapped their DLN.

Measures

The questionnaire used well-validated scales to measure self-regulation, computer learning self-efficacy, performance-approach, and performance-avoidance (Pajares, 1996; Santhanam, Sasidharan and Webster, 2008; Zweig and Webster, 2004). The DLN was mapped by asking each student to indicate the presence or absence of course-related e-mail communication with other students. Using UCINET-6, degree-centrality was computed as the number of ties of an actor to the maximum possible number of ties and betweenness-centrality as the extent to which an actor falls between other pairs of actors who were not themselves connected (Borgatti, Everett and Freeman, 2002). Drawing upon the Information Systems Success (ISS) model (DeLone and McLean, 2003), e-learning success were measured using two variables: information quality and system quality. The former captured the information attributes of the system such as its learning impact, completeness, sufficiency, and relevance, while the latter captured the desired attributes of the e-learning system such as its perceived usefulness and ease of use.

PRELIMINARY DATA ANALYSIS AND RESULTS

A total of 110 students participated in the study. After excluding questionnaires that were improperly filled or incomplete, there were 102 usable responses. The correlations are presented in Table 1 and are significant for self-regulation, self-efficacy, degree-centrality, and betweenness-centrality with the dependent variables; information quality and system quality.

	Variables	1	2	3	4	5	6	7	8	9	10	11	Mean
1	Age	1											19.2
2	Gender	-.151	1										1.5
3	Experience	-.058	-.095	1									1.3
4	Self-Regulation	-.111	-.077	.297*	1								4.2
5	Self-Efficacy	-.043	.003	.286*	.774**	1							4.0
6	Per-Approach	-.131	.082	-.129	-.024	-.029	1						4.1
7	Per-Avoidance	.176	.035	-.149	.023	-.047	-.034	1					4.0
8	Degree-Cent.	-.068	.037	.303*	.764**	.738**	-.128	.068	1				0.4
9	Betweeness-Cent.	.192	-.129	.251	.458**	.407**	-.214	.203	.484**	1			0.3
10	System Quality	.053	.031	.227	.755**	.760**	-.098	.015	.755**	.556**	1		3.7
11	Information Qual.	-.042	-.104	.397**	.776**	.751**	-.049	-.016	.757**	.542**	.675**	1	4.0

** Significant at the .01 level; * Significant at the .05 level

Table 1. Means and Intercorrelations

Preliminary multivariate tests also indicate a significant relationship for these variables on the joint distribution of the two dependent variables. More detailed tests are being conducted, the results of which will be presented at the conference.

CONCLUSION

There is initial support for the contention that learner attributes complemented by centrality positions in the DLN influence e-learning success. This emphasizes the need for greater personalization of online courses and the conscious development of a dense DLN.

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