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CAN DEEP LEARNING APPROACH BE VIRTUALLY CULTIVATED VIA SOCIAL LEARNING NETWORK

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Abstract

With the development of information technology especially kinds of social interaction techniques, social learning networks as a new platform have changed students' learning behaviors and improve their learning performance. However, how this change happens especially how social learning networks change students' learning approaches were not very clear. To address this gap, in this research, we try to investigate the impacts of social learning network on students' learning approaches by conducting an experiment. In the experiment, students were randomly divided into two groups: control group and experimental group. We try to investigate the differences of students' leaning behavior in terms of learning approaches in the two groups. We also present the theoretical, practical implications and future research.

Keywords: e-learning, social learning network, learning approach, surface learning, deep learning

1   INTRODUCTION

With the development of information technology especially kinds of social interaction techniques, many social networking sites (e.g., Facebook, Myspace, Twitter) have emerged and become pervasive, which have changed the way people build their social relationships and communicate with each other (Boyd，D.M. et al. 2008; Park 2014). These social networking websites provide a platform for users to express themselves through building their profiles and updating their status (Ellison 2007). In addition, via social networking sites, users can enhance their existing social relations with known people (e.g., friends, family members, classmates) and at the same time create new relationships with totally unknown people. Given the benefits that people may obtain from the engagement, social networking sites are employed in various contexts to conduct learning, for example, in business context to train customers and employees (Fry 2001; Strother 2002), in higher education to facilitate teaching (Mahdizadeh et al. 2008). This transformation has a tremendous effect on learning. However, the pure social networking sites are criticized when directly used as a platform to facilitate students to conduct their learning due to distraction，security and other issues especially for college students (Ahn 2011; Ahn 2012). For example, the entertainment elements and applications on conventional social networking sites may distract students from learning (Fewkes et al. 2012).

Social learning networks are online communities that maintain the social and interaction parts of social networking sites. Social learning networks are characterized by collaborative and social learning activities where students can learn from each other by exchanging and sharing information. Different from traditional e-learning system where students learn in isolation, social learning networks address collaborative learning process and social interactions among students (Xu et al. 2014, p.Chengdu). When a student joins a social learning network site, he/she first builds a personal profile to demonstrate their interests. Through various functions provided by social learning network site, students can express themselves and communicate with other members (Pérez-Mateo et al. 2011; Williams et al. 2009). Through engaging in social learning network, students can build social relationships with other members and obtain kinds of information contributed by their peers.

In terms of learning outcomes (e.g., the scores or grades given by a lecture, the skills or knowledge obtained from learning), some students are more successful than others.To further understand the influence of social learning network on students, we should transfer from the outcome-oriented view to process-oriented view. Therefore, in this research, it is necessary to go further to examine students' learning approaches. As claimed by Ausubel (1968), different learning outcomes may be due to differences in the way students learn, in other words, their learning approaches-whether deep learning approach or surface learning approach (Chin et al. 2000). Students using different approaches may behave differently. For example, students using deep approach tend to understand the meaning of learning materials, construct relations among parts of learning materials, and think creatively (Wilson et al. 2005). While students using surface approach attempt to memorize learning materials by rote learning, view the elements of learning materials isolated from others and think superficially (Groves 2005). Previous research has found that many factors may influence students to adopt a deep learning approach or surface learning approach, e.g., their motivation, ability, personality, attitude, prior knowledge and situational context (Chin et al. 2000). Particularly in this research, we try to investigate whether the learning context especially using social leaning network to facilitate learning can influence students' learning approaches.

According to social leaning theory (Bandura 1977), learning can be considered as a continual process where learners, their peers and their situated environment interact with each other. Learners' attitude, motivation, cognition, affection and behavior are influenced by the interactions of students with peers and the situational environment (Yu et al. 2010). Most current research investigates the influence of learning related system on students either from process perspective (e.g., learning process) or from the result perspective (e.g., learning outcome). Although several studies have examined the impacts of

traditional e-learning system and conventional social networking sites on learning outcome(Yu et al. 2010) and the results are encouraging, whether the results can be extended to social learning networks need further investigation. As claimed by Ma et al. (2007), the electronic environment is the foundation and medium through which community members interact, where the purpose of participants, the supported technologies involved and the way how members interact with each other are different. These differences may lead to different users' behaviors and even outcomes. Different from traditional e-leaning system (e.g., blackboard) and conventional networking sites, social learning network emphasize the role of social interactions in learning. Specifically, through interactions with social learning networks and peers there, students are encouraged to ask questions, get feedbacks, conduct conversations, obtain helps, explain to others towards a specific problem based on their understanding and discuss with their peers during learning process. Furthermore, few researches investigated the pedagogical impacts of social learning networks on students' learning behavior. In addition, learning outcome is the learning result, we need to go deep to investigate the learning process and further understand how social learning networking sites affect students' learning approaches. By understanding how students' learning approach may be influenced, we can design corresponding mechanism to encourage more students to adopt deep learning approaches and improve their learning performance ultimately.

To understand the influence of social learning networks on students' choices of learning approaches, we first explore the characteristics of social learning networking sites to demonstrate their uniqueness, and then based on social leaning theory and the specific research context, we develop several hypotheses, at last we conduct an experiment to verify whether students' learning approach can affected by testing the proposed hypotheses. The experimental results that compare the influence of blended learning (which is, conventional classroom learning plus using social learning network sites) and conventional classroom learning on students' learning approaches suggest that social learning networking sites are reshaping the way how learning is conducted, and social learning networking sites is complementary to conventional classroom learning.

2 LITERATURE REVIEW

2.1 Social leaning networks

With the development of web 2.0 techniques, social network sites and corresponding services have been largely used to enable connections of people all over the world. Considering the social nature of learning where learners need to communicate with others, existing social network sites like Facebook have been used as a platform to facilitate learning (Bosch 2009). However, directly using existing social network for learning has been criticized due to distraction, security and other issues (Fewkes et al. 2012). Some students may spend much time on chatting with other students on funny topics which are not related to learning. For example, they attempt to talk about movies, sport and social news, funny places they are going to visit. Students using social network for learning worry about the exposure of their information to unexpected people. On the one hand, they are worried that their academic progress may be discovered by social friends; on the other hand, their normal social life information may be accessed by instructors or classmates (Wang et al. 2012).

Conventional social networks often focus more on the "social" and "network" parts, which address the connecting aspect. Social learning network tries to incorporate the social network parts and the pedagogy parts together to enable students to master the curriculum. Social learning network stresses on the collaborative learning process and the social interactions between students. Through social learning network, the learning mode is collaborative or social learning, and the knowledge transfer mode can be from instructors to students and from students to students.

Social learning network is a cyber environment that allows students or learners to construct his/her online profiles or resumes, update statuses, and add photos. When a student joins a social learning

network site, he/she first creates a personal profile. These profiles display information such as their names, their photos, their educational background, and contact information. Furthermore, learners can manage and share their learning materials easily. Particularly, learners can upload/download course materials, store and tag files, share resources and ideas with peers, receive comments from instructors, and discuss topics relevant to course. Besides, social learning networks allow for efficient communication and collaboration among students. Students can browse other members' profiles and send invitations, collaborate and stay connected with other peers, create and organize Web 2.0 enabled groups. Current collaborative learning tools in social learning network include awareness of other members, joint building of knowledge, and certain value-added services, like automatically matching unnoticed learners and resources. These tools allow students to easily interact with and support each other. Social learning network help students to form a learning community and encourage students to become content creators.

Much existing research has focused on how engagement in social networks can influence students' learning behaviour (Greenhow et al. 2009; Kirschner et al. 2010). Considering the difference between conventional social networks and social learning networks, whether the findings can be generalized into social learning networks needs further investigation.

2.2 Social learning theory

Although there are a variety of theorists using the social learning label, Bandura's (1977; 1986) social learning theory has been widely used to explain learning behaviour happening in various context. Social learning theory argues that learning can be considered as a dynamic and reciprocal interaction of person, environment and behaviour (Gibson 2004). According to social learning theory, individuals' observations and interactions with peers and situations will influence their cognition and learning behaviour (Yu et al. 2010). Previous research has identified various environmental factors which may influence learners' behaviours. Wu et al. (2010) classified the environmental factors into two categories: the technological (refers to system functionality and content feature) and social environment (refers to interaction and learning environment). Piccoli et al. (2001) believe that interaction among learners is one of the learning environmental factors. Integrating social learning network into conventional face-to-face learning creates opportunities to facilitate students' interactions. The establishment of positive interaction relationships among students and between instructors and students may create a comfortable online study atmosphere in the social learning network. And the comfortable online learning climate encourages and stimulates the exchange of ideas, opinion, information and knowledge in social learning networks.

Social learning network can be considered a particular learning environment. On the one hand, social learning networks serve as a knowledge source where students can contribute knowledge online. And by the seeking and sharing functions provided by social learning network, students can exchange knowledge with their peers. Through social learning network, students can read their peers' experiences and shape their attitudes and behaviour accordingly. On the other hand, students may treat social learning network as a place to meet their peers, to seek emotional support and a sense of belongingness. Corresponding interaction functions provided by social learning enable students to collaborate and communicate with each other. Students learn many skills from one another through interpersonal communications. These kinds of communications may enhance their creative thinking and deep understanding toward a specific leaning topic. In addition, the commitment and culture formed by the social leaning networks may also affect students' learning behaviour.

2.3 Approaches to learning

Approaches to learning or learning approaches can be defined as "the ways in which students go about their academic tasks, thereby affecting the nature of the learning outcome" (Biggs 1994). An approach to learning embeds the intention of the student when starting a task and the corresponding strategies used to complete the tasks (Baeten et al. 2010).

The research on learning approach can be traced back to Marton (1975; 1976), who revealed students' differences in terms of learning approach when they are asked to carry out a specific task. Marton et al. (1976a; 1976b) came up with the idea of "approach to learning". And lately a conceptual framework "student approaches to learning" (SAL) theory (Biggs 1993) has been proposed. In order to quantitatively measure students' learning approaches, several questionnaires have been developed to help measure students' learning approaches in higher education based on self-reporting mechanisms, including the Approaches to Studying Inventory (ASI) (Entwistle et al. 1983) and the Study Process Questionnaire (SPQ) (Biggs 1987).

Based on motive and related strategy, the SPQ (Biggs 1987) discriminates three learning approaches: deep, surface and achieving approach. Students with deep learning approach demonstrate internal interests and appropriate engagement in the related tasks. Students with surface learning approach are motivated by a fear of failure, and they try to complete a task with little effort as possible. Students with achieving approach attempt to make effective use of space and time in order to maximize outputs. Although SPQ are widely used to measure students' learning approaches (Choy et al. 2012; Entwistle et al. 2000), Zeegers (2002) argues that learning approaches are best described through the use of two factors, and strategy approach scale is not necessary. Biggs et al. (2001) propose a Revised Two Factor Study Process Questionnaire (R-SPQ-2F). R-SPQ-2F is a 20-item questionnaire which uses a five-point Likert-type scale to categorise leaning approach into two dimensions: surface and deep. Within each of these categories are two sub-categories: motive and strategy.

3 EXPERIMENT DESIGN

To evaluate the influences of the social learning network on students' learning approaches, an experiment was conducted in a university in China to investigate the differences of the students who participate in the learning activity in the same course within different learning contexts.

3.1 Participants

Third-year undergraduate students who were from college of business and took the same course will be invited to participate the study. And the study will last for one semester. Students were third-year undergraduate students, and they need to take the same course related to information systems to complete their undergraduate study. Students would be informed that the study focused on understanding their learning process but not aware of the specific purpose of the study.

3.2 Experimental process

Students' learning approach was identified using the R-SPQ-2F. And the experimental process is shown in figure 1. Students who participated in the study were randomly assigned to two groups- experimental group and control group. The students in the control group engage in conventional face-to-face learning context. And students from the experimental group engage in blended learning context. Blended learning context mean that both conventional face-to-face learning and social learning network site are employed to facilitate learning. At the beginning of the course, both groups of students were told about the goal and general introduction of the course. And they were asked to complete the pre-test questionnaire. Students from experimental group engaged in blended learning context were asked to register as a member of Scholarmate. The learning materials will be uploaded on the community, and they can share their ideas and learning resources through the platform. Both groups of students were told that their performance would be evaluated based on their class attendance, course participation, the quality of the assignments and their final examination scores. In addition, students from experimental group were told that their engagement in social learning network sites would be part of their evaluations.
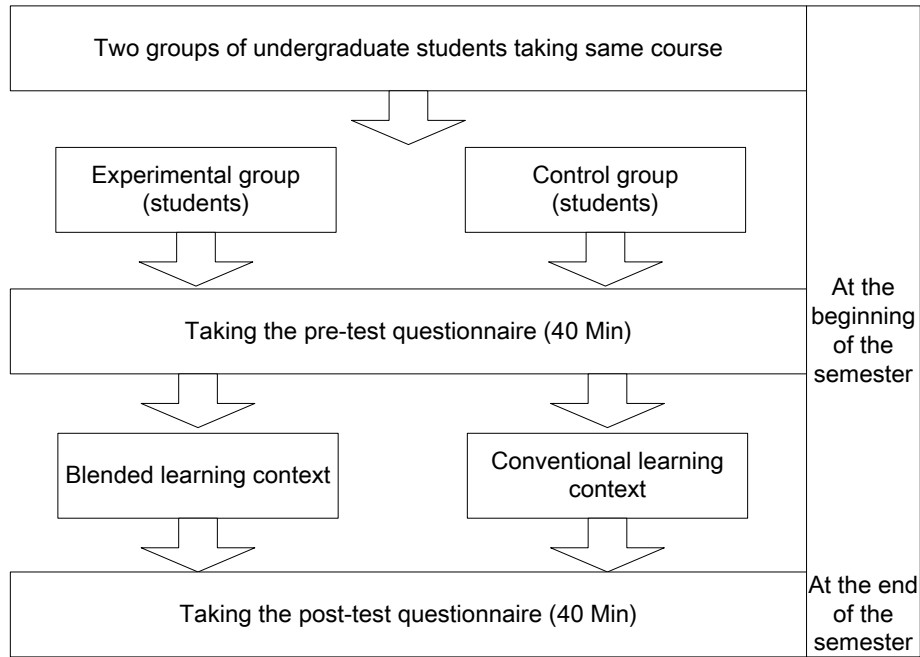
Figure 1.   Experimental design of the learning activities

3.3   Measures

The questionnaire is designed to understand students' learning approaches. The measures for all the constructs of the questionnaire were adapted from previous relevant research. Slight modifications were made to make the expressions more appropriate and understandable in current research context. This part to measure students' learning approach contains twenty items, where ten items were used to measure surface and deep approach respectively. And the ten items were further classified to measure motive and strategy respectively. Therefore, there were four dimensions to measure learning approaches: surface motive, deep motive, deep learning and surface learning. To fill in questionnaire, students were asked to use a five-point Likert scale ranging from 1 to 5 to reflect their true feeling about their leaning approach.

4   EXPECTED EXPERIMTNAL RESULTS

4.1   Analysis of pre-test questionnaire

As it is a kind new experience for students to learn with the aid of social learning networks, it is interesting to understand students' learning approach during the learning process. In other words, we want to know what happened before and after the learning activity. Deep learning approaches are reflected in two dimensions: deep motive and deep strategy. Similarly, surface learning approaches are also reflected in two dimensions: surface motive and surface strategy. Therefore, we want to investigate whether there are differences between students from experimental group and treatment group at the beginning of the semester. Specifically, we want to test whether there are differences between two groups of students in terms of surface motive, surface strategy, deep motive and deep strategy.

4.2   Analysis of post-questionnaire

The aim of this research was to examine the influences of the social learning network site on students' learning behaviour in terms of their learning approaches. After the learning activity, students were required to complete the post-test questionnaire. From the post-questionnaire, we can investigate whether there are differences between students from experimental group and treat group at the end of the semester. In other words, we want to test whether there are differences between groups of students in terms of surface motive, surface strategy, deep motive and deep strategy. We expect that students from experimental group may demonstrate high scores of deep motive and deep strategy.

4.3   Analysis of differences of learning approach

The aim of previous analysis is to understand the influence of the two learning contexts on students' learning approaches. We assume that comparing to conventional learning context, students engaged in blended learning context would report higher scores on deep learning approaches and lower scores on surface learning approaches. In this part, we want to further understand whether students' change of their learning approach is different in two learning contexts. To do this, the differences of students' scores on their learning approach between beginning of semester and end of the semester were calculated separately for the control group and treatment group. And then we will use MANOVA to analyze the experimental results.

4.4   The effect of students' previous learning approaches

From the analysis results of previous parts, we know that involving social learning networks into learning process can influence students' learning approaches. However, we don't know whether this assumption will be held for students with different previous learning approaches. Based on students' score on learning approach in the pre-test questionnaire, we categorized students into two kinds of learners, which are "previously deep" or "previously surface" learners. And "previously deep" students were students who scored higher on a deep than a surface learning approach. Conversely, "previously surface" students were students who scored higher on a surface than a deep learning approach. The difference in "previously deep" and "previously surface" students' deep motive and strategy scores between two learning contexts was analyzed using MANOVA.

5   DISCUSSIONS AND CONCLUSIONS

This paper tries to understand the influence of social learning network on students' learning approach. In this research, we just propose the research framework and the expected results. And a great deal of future work should be done to further investigate the effect. First, experiment based on the proposed framework should be carried out. We will invite students from a university in China to participate the experiment. The selected students will be randomly divided into two groups: experimental group and control group. For students in control group, conventional face-to-face classroom will be used. For students in treat group, both conventional face-to-face classroom and social learning network will be used. And a social learning network called "*Scholarmate* "has been developed by us. *Scholarmate* is a learning community which enables students to build their profiles, share document, find friends and obtain feedbacks from their peers. We will use "*Scholarmate* " to conduct the experiment. Second, we try to demonstrate the influence of social learning network sites on students' learning approaches. Future research will further investigate how and under what conditions can this kind of influence exists.

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