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# UNDERSTANDING USERS' SATISFACTION WITH SOCIAL LEARNING NETWORK

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## Abstract

*The social learning network (SLN) constructed based on web 2.0 techniques demonstrates some unique characteristics comparing to traditional e-learning context based on 1.0 technique. In response to the new characteristics in SLN, we advance the theoretical understanding of user satisfaction by reconceptualising e-learning as a relational process among students. Based on that, we draw on network externalities and social capital theory to examine users' satisfaction with social learning network. Considering that network externalities are involved in the process, we propose that two types of network externalities: direct network externality and indirect network externality moderate the relationship between social capital and user satisfaction. Theoretical, practical implications and future research are also discussed.*

*Keywords: e-learning, social learning networks, social capital, network externalities*

# 1 INTRODUCTION

Since its introduction, e-learning system as a new paradigm of modern education has been employed as a tool to help learners conduct online learning crossing borders of time and space (Alkhalaf et al. 2012). It is estimated that the global market for e-learning is projected to reach \$168.8 billion by 2018<sup>1</sup>. Combined with digital devices and networks, e-learning systems are transforming the way how learning is conducted. This transformation has tremendous effect on learners and learning service providers. Complementing with traditional learning environment, e-learning system provides a platform for supporting effective communication between learners and instructors (Sun et al. 2008). Due to its convenience and cheap cost, e-learning system has been implemented in various contexts, for example, in schools to facilitate typical face-to-face learning, in companies to inform and educate employees or customers, and in society to help offer lifelong learning services (Saadé et al. 2012). In this research, we focus on using e-learning system in universities where the main users are college students.

E-learning system evolves with the development of information technologies. With the emergence of new information technology especially web 2.0 techniques, which refers to the second generation of the World Wide Web, there has been a recent transformation of e-learning system from a central controlled mechanism to an interactive and conversational social learning network (Banday 2012; Wang 2011). In social learning network, based on the assumption that knowledge is socially constructed, students are encouraged to share their understanding on the course with others and the learning mode has been changed into *collaborative learning*. The collaborative learning via social learning network may have two related benefits. On the one side, social learning network can support effective communications among students, and enable them to freely share their understanding and discussion about the course, improving the learning effectiveness (i.e., *functional* benefits). On the other side, the additional communication channel may help the development and enhancement of social relationships (Wang et al. 2011) and bring students with *social or relational* benefits. The transfer from the traditional one-way learning paradigms to the new collaborative learning styles calls reconsidering the factors reflecting the unique features of the social learning network.

Two research issues should be addressed to capture the social interactions between users. The first issue is to understand what exact values can be generated through the social interaction process and the extent to which these values can affect users' satisfaction with social learning network. Following the first issue, the second issue is to understand the boundary conditions under which the generated values can do exert their influences on user satisfaction. Social capital theory that emphasizes the value co-creation embedded in social relations can be used to address the first issue (Nahapiet et al. 1998). Based on this theory, we propose that social capital as a set of resources embedded within the social relationships among actors within a network will impact the value of users. Specifically, we hypothesizes that two types of social capital (bridging social capital and bonding social capital) have impacts on users' satisfaction with social learning network. To further understand the boundary conditions of these impacts, the features of social network are considered. Drawing upon the network externality theory, we propose that network externality moderates the relationship between social capital and user satisfaction such that this relationship would be stronger when network externality is high.

This study makes several contributions. First, it adds to the existing learning literature on user satisfaction with social learning network by reconceptualising e-learning as a social relational process. By comparing the differences between traditional e-learning system and social learning network, we address that the learning activities are more social and more collaborative than traditional e-learning context. Second, it integrates network externality and social capital theory to understand user

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<sup>1</sup> <http://www.prnewswire.com/news-releases/global-market-for-elearning-to-reach-169-billion-by-2018-private-tutoring-nears-103-billion-in-market-value-180027521.html>

satisfaction with social learning network. Third, by understanding the factors which influence students' satisfaction with social learning network, the findings of this research may help to build more effective social learning network.

## **2 THEORETICAL BACKGROUND**

### **2.1 Students' satisfaction in e-learning context**

With the increasing usage of e-learning system to facilitate education, students' satisfaction with e-learning system as a key indicator to measure the effectiveness of an e-learning system, has attracted many researchers' great attention. Researchers are attempting to investigate various factors that may influence students' satisfaction from different aspects (Gonzalez-Gomez et al. 2012; Johnson et al. 2008). Better understanding of students' satisfaction with e-learning system can help service or system providers know what factors are vital to affect students' attitude towards the e-learning system and ultimately enhance the performance of the e-learning system by improving the quality of corresponding factors.

From the dimension of learners' characteristics, it is found that features such as gender (González-Gómez et al. 2012) and anxiety with computers (Ali 2012) may influence their satisfaction with e-learning system. From the technical dimension, technology and system quality are regarded as two key antecedents of learners' satisfaction (Sun et al. 2008). However, the majority of previous research on users' behaviour has addressed the traditional e-learning context which is constructed based on web 1.0 technique. The studies conducted based on web 2.0 platforms are relatively rare. Even in the limited studies in the context of social network, they focus on the pure social network sites where the main purpose is for fun instead of pure learning context (Yu et al. 2010). Therefore, it is imperative to investigate the learning behavior in the social learning network by grasping the new features of research context and provide a context-specific research model.

### **2.2 Social learning network**

With the development of web 2.0 techniques, social network sites (e.g., MySpace<sup>2</sup>, Facebook<sup>3</sup>, RenRen<sup>4</sup>) and corresponding services have been largely used to enable connections of people all over the world. Social learning network stresses on the collaborative learning process and the social interactions between students.

Traditional e-learning platform is developed based on web 1.0 techniques while social learning network is constructed based on web 2.0 techniques. The essence of web 2.0 is to encourage users to share information therefore changing single-source information to diversified linkage (Wang et al. 2011). Thus, social learning network changes students from passive information recipients to active information contributors or collaborative information creators. 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 profile, update status, add photos, create and join groups, share information, upload/download course materials, and to link other members by kinds of applications (Pfeil et al. 2009). 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. They can also click on their members' profiles and send invitation to become friends. Current collaborative learning tools in social learning network include awareness of other members, joint building of

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<sup>2</sup> <https://myspace.com>

<sup>3</sup> <http://www.facebook.com>

<sup>4</sup> [www.renren.com](http://www.renren.com)

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.

According to the social interdependence theory of cooperative learning, the way social interdependence is structured determines how individuals interact, which in turn influences their attitudes and even learning outcome (Johnson et al. 2009). Social learning network as a new learning platform may change the learning mode and interaction way to some extent and which exhibits some unique characteristics different from traditional e-learning context. Therefore, it is necessary to reconsider these factors and investigate what might influence students' satisfaction in the context of social learning network.

### **2.3 Social capital theory**

Social capital theory postulates that individuals or organizations possess kinds of capability accumulated from resources which are embedded in their social relationships (Nahapiet et al. 1998). The concept of social capital has been used to explain a variety of social behaviours, including collective action, community involvement, and differential social achievements (Wasko et al. 2005). In this study, we follow the definition by Bourdieu and Wacquant (1992) and define social capital as “the sum of the resources, actual or virtual, that accrue to an individual by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition” (p.14). Specifically, in social learning network, the resources refer to learning materials, related learning knowledge and information maintained.

The quality of communication of students is likely to be enhanced by a much greater emphasis on the cultivation of various extra-curricula activities which can be supported by social learning network. Especially for students who are shy to speak in public and far away from each other in terms of physical distance, the social learning network provides them a platform to express their opinions freely and discuss with other peers as they want.

Putnam (2001) identified two types of social capital namely bridging and bonding social capital. Bridging social capital is closely associated with “weak ties” and focuses on relationships that span different groups, linking heterogeneous groups together and providing a means of strengthening the larger society (Ellison et al. 2007; Wuthnow 2002). In our research context, it is used to describe the connections between students who don't know each other previously. Bridging social capital embedded in social learning networks enables students to know about each other especially for those who have no previous relationships through online environment. Therefore, bridging social capital can help to build relationships with *width*. Bonding social capital is related to social capital of people who already know each other. In our context, bonding social capital describes the phenomenon that students who have previous relationship. Thus, bonding social capital can enhance social relationships with *depth*.

### **2.4 Network externality**

Network externality refers to the fact that the value which users obtain from a product or service will be increased with more users (Katz et al. 1985). Telephone is a typical example of network externality in that as the number of telephone users reach a critical mass, it not only provides subsequent users with more respondents but also attracts third parties to join in, leading the service quality to be improved (Lin et al. 2011). The underlying principle of network externality is that users may obtain additional value derived from interacting with other users and from the complementary products (Liebowitz et al. 1994). With more users joining social learning network, the possibility of knowing and communicating with other users is increasing. Therefore, the obtained value of using social learning network may also increase.

Previous research has pointed out that there are two types of network externality: direct network externality and indirect network externality (Podoyntitsyna et al. 2013). Direct network externality

arise when the values of a particular product or service increase as the number of users increases (Aggarwal et al. 2012). In this research context, it describes the fact that when the number of students in a social learning network increases, a student can communicate and share knowledge with more students. Indirect network externality refers to the value of a product or service increases when there is a greater availability of its complementary products (Basu et al. 2003; Dubé et al. 2010). Social learning network provides many complementary services for users to engage in various social applications on the website. The example includes people searching, communication supporting, knowledge sharing and other application tools. Direct network externality is concerned about the demand side of the network which emphasizes the value generated through the size of users, and indirect network externality is the supply side which addresses the value obtained via complementary products.

### 3 RESEARCH MODEL AND HYPOTHESES

Using network externality and social capital theory as the theoretical foundation, we develop the research model as shown in figure 1. In this study, we propose that social capital (bridging and bonding) influences students' satisfaction with the social learning network. We further posit that network externality (direct and indirect) positively moderate the relationships between social capital and their satisfaction with social learning network.

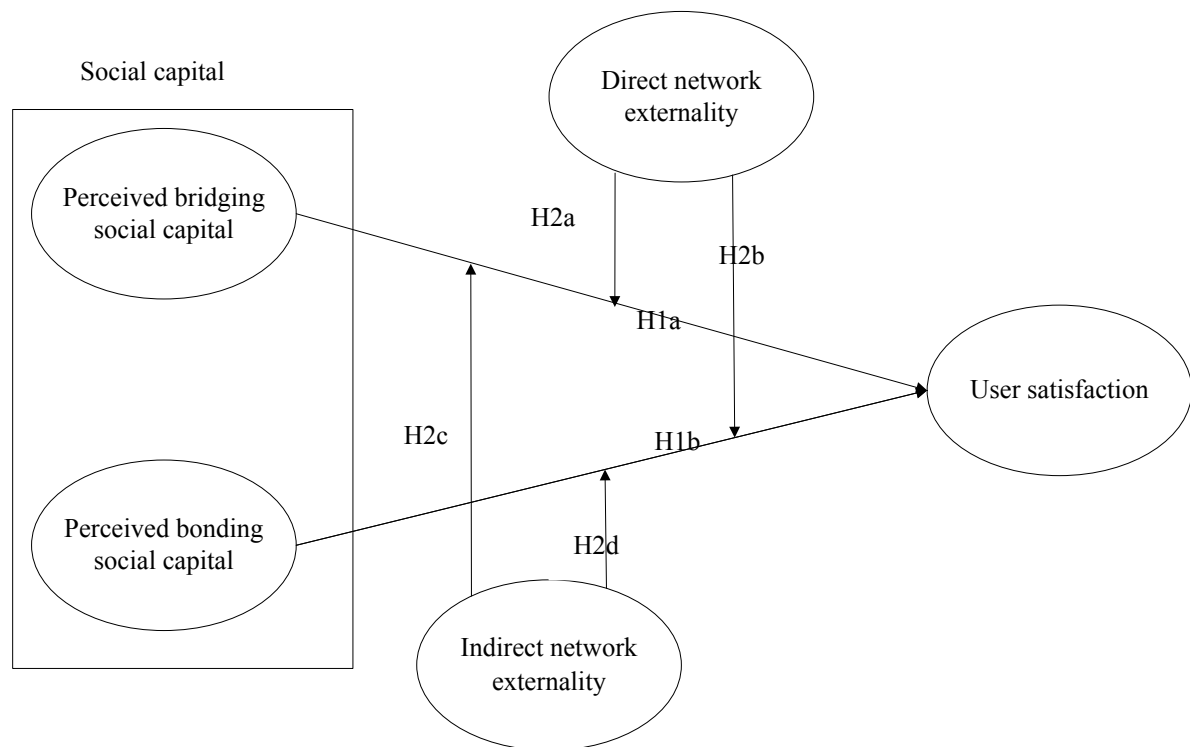


Figure 1. Research Model

#### 3.1 Bridging social capital and user satisfaction

In this research context, bridging social capital is concerned about the weak ties between students and the ensuing benefits. There are accordingly two types of benefits realized via social learning network: social benefit and functional benefit. Social benefit arised from bridging social capital means that for students from different majors and different classes, social learning network as a platform enables them to extend their social circles related to learning. Functional benefit generated from bridging social capital is reflected in that social learning network can enable students to share information or

knowledge with more previously unknown students. A better understanding and communication with previously unknown students may help them listen to different voices. The diversity of members other than previously close classmate enables students to expand their knowledge and expertise (Hernández-Serrano 2011).

Bridging social capital facilitates the meaningful communication needed for the development of social relationship among students who may not be familiar with each other. Bridging social capital can also help students exchange their ideas and knowledge, which may help satisfy students' learning needs, thereby contributing to their satisfaction toward social learning network. Thus, we hypothesize the following.

Hypothesis 1A (H1A). Bridging social capital positively influences user satisfaction with social learning network.

### **3.2 Bonding social capital and user satisfaction**

Bonding social capital reflects strong ties with close classmates in this context, which may provide students with emotional support or access to resources. When students confront with some difficulties in the learning process, they may resort to members they are familiar with to ask for opinions via the social learning network. In addition, the reciprocal trust built on the strong ties can in turn facilitate sharing knowledge and information by reducing perceived risks or costs that students may be afraid of. Thus, high bonding social capital leads student to feel that they are tightly connected with other students. By contrast, when bonding social capital is low, members may perceive others distant from them, and they may be less collaborative, leading to lower satisfaction with the social learning network. Therefore, we propose

Hypothesis 1B (H1B). Bonding social capital positively influences user satisfaction with social learning network.

### **3.3 Moderating effects of network externality**

Network externality positively moderates the relationship between social capital and user satisfaction. Direct network externality refers to the fact that the value of social learning network increase with more users. When the network scale becomes larger and more students are involved in the social learning network, they feel more connected. Thus, students may gain more social benefit in that their social circles is expanded and more relationships are developed or enhanced. In addition, they can share information and ideas with more people, resulting in increasing their functional benefits. Therefore, direct network externality would moderate the relationship between social capital and user satisfaction positively. Thus, we hypothesize

Hypothesis H2A (H2A). Direct network externality positively moderates the relationship between perceived bridging social capital and user satisfaction.

Hypothesis H2B (H2B). Direct network externality positively moderates the relationship between perceived bonding social capital and user satisfaction.

Indirect network externality refers to the fact that the value of social learning network increases with more applications and tools. More applications make it easier for students to connect new people and obtain social support from their members. Furthermore, more applications and tools available on the social learning network enable students to share information more easily, e.g., they can express their own opinions and get other's opinions as they want. Therefore, the relationship between social capital and satisfaction will be stronger when there are more complementary applications and tools.

Hypothesis H2C(H2C).Indirect network externality positively moderates the relationship between perceived bridging social capital and user satisfaction.

Hypothesis H2D(H2D).Indirect network externality positively moderates relationship between perceived bonding social capital and user satisfaction.

## 4 DISCUSSIONS AND IMPLICATIONS

This study has several theoretical contributions. First, this study extends previous understanding of students' learning behaviour in traditional e-learning context to e-learning web 2.0 context by identifying the distinctions between these two research contexts and discovering how students' behaviour changes due to these distinctions. Second, this study enriches the e-learning literature by introducing the social capital theory into the learning behavior research and identifying the roles of bridging social capital and bonding social capital in shaping user satisfaction. Specifically, the e-learning platform based on the social network technology enables students to know more people (e.g., social benefits generated by the bridging social capital) and improve their learning effectiveness (e.g., functional benefits generated by the social capital). The fulfilment of these needs makes users become more satisfied with the social learning network. This study suggests future researcher to take the social capital theory as the theoretical foundation for understanding the learning behavior in the social learning network. Third, this study points out the boundary conditions under which social capital exerts its impact on user satisfaction by addressing the role of network externality.

The study also has several practical implications. First, regarding bridging and bonding social capital as key predictors of user satisfaction, social learning network designers should pay attention to the applications that can facilitate users to more freely and easily contact with others and share their opinions. Second, because network externality can amplify the impact of social capital, social learning network providers should try their best to attract more users to use the platform and pay special attention to providing more complementary products or services.

## 5 FUTURE RESEARCH

This paper tries to combine network externality and social capital theory to examine students' satisfaction with social learning network. And a great deal of future work should be done to further understand students' behavior in social learning network. First, empirical investigations based on the proposed model should be carried out. In order to test the proposed model, students from a university in China are invited to use a real social learning network system namely "*Scholarmate*"<sup>5</sup>. *Scholarmate* is a professional community web site constructed by us, which is equipped with many applications and tools, including discussion boards, online chatting, document repository, friend searching, status updating, email and other interaction mechanisms. On *Scholarmate*, students can share different kinds of learning knowledge in terms of documents, videos and reports with a particular or a group of students. Students can also receive comments and suggestions if they have questions. Students can browse others community members' profiles and add them into their contact list as friend. For future research, we will invite students to use *Scholarmate* and collect their experience data based on their usage. And we will test the proposed model using the collected data. Second, we only consider two factors namely network externalities and social capital in this research. Other possible antecedents of user satisfaction may be taken into account in future research.

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<sup>5</sup>[Http://www.scholarmate.com](http://www.scholarmate.com)



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