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ABSTRACT

The use of social technology in classroom has shown various results. This paper focuses on using social technology as a case-based learning tool. A total of 116 students in a public university in Thailand were formed into teams, and spent two weeks in discussing a Harvard business case via the social technology; Edmodo. After the experiment, an online survey is conducted with these participants to assess the individual learning performance in case-based learning via social technology. Task-technology fit (TTF) was also used to assess the impact on learning performance and the tasks that the students perform by using Edmodo as a learning tool. Our findings suggest that social technology be used as a fit learning tool to improve students' understanding of business cases. We concluded that the higher perceived task-technology fit for the social technology, the better learning performance in both near and far knowledge for the students.

Keywords

Collaborative Learning, Web2.0, Social Technology, E-Learning

INTRODUCTION

Although college students are embracing social technology to stay connected with friends, very few of them would consider adopting it as an online learning tool to improve their understanding of business cases widely used in the management curriculum (Rahman, Ghazali, and Ismail, 2011). Case-based learning is an effective pedagogy to help students acquire skills in analytical and diagnostic thinking, develop strong persuasive skills, and make decisions under conditions of uncertainty (Lee, Bonk and Magjuka, 2009). To achieve these benefits, students need to engage in active learning by working in groups, building constructive relationships, sharing knowledge, and constantly exchanging information with other group members (Chen, Chen, and Kinshuk, 2009). Although these four collaborative learning modes are essential to the success of case-based learning, the efficacy of delivering them via social technology remains unanswered.

An online social technology is embedded with four primary technical features, including sharing, grouping, conversation, and relationships (Hu and Gollin, 2010). Since these features are also essential to the success of case-based learning, social technology may be an effective pedagogical tool for the case-based learning method. In order to better understand the efficacy of online learning technology on case-based learning, this study adopts the task-technology theory to examine the logical relationships among social technology characteristics, task-technology fit, learning performance, and utilization. Findings of this study can provide insights on whether social learning technology is a good fit for business students to acquire case-based learning skills and knowledge.

The remaining sections will first develop a theoretical model based on a literature review on these four constructs. Hypotheses will then be proposed based on the model. Research methodology will be introduced to discuss the data collection procedure and data analysis method. Hypotheses testing results will be reported, followed by limitations and future research. Academic and practical implications will be discussed to conclude this paper.

LITERATURE REVIEW

Social Technology as a Case-based Learning Tool

Social capital is the actual and virtual resources accumulated via the social networks or relationships among people (Coleman, 1988). The more social capital available in an online community, the more social capital members will contribute to the community. Because social capital is a cause and an effect (Williams, 2006), increasing social capital relies on mutual support among members to produce positive social outcomes (e.g. trust, shared information, self-esteem) (Adler and Kwon, 2002). Although social capital underpins the success of online social networks, developing them effectively remains a challenge for many online communities.

Social capital cultivation is particularly important for the success of case-based learning, an important element of management education (Hsiung, 2002). In the face-to-face environment, students have plenty of opportunities to interact with each other, with their team members, guest speakers, and instructor. Before each class discussions, students need to study facts related to the studied business cases, and define business problems faced by different stakeholders in the case. Intensive discussions can help expose each student to diversified ideas, and brainstorm with new, useful ideas to solve business problems. An instructor often plays facilitating roles in having students or student teams play the protagonist role and lead constructive discussions on solving business problems on hand (Leinerd and Jarvenpaa, 1995). All these opportunities available in the traditional setting can help effectively develop social capital in the classroom and enhance the effectiveness of management education.

The emergence of online social technology poses great opportunities to enrich case-based learning because it enables more learners to exchange information and share knowledge at anytime and from anywhere (Buendia et al., 2004). The learning flexibility can expose students to more diverse viewpoints, ideas, and opinions. If managed properly, more, newer, and better ideas shared by community members can lead to better solutions to resolving business problems related to the business case (Mohamed and Matthias, 2007). Information about a student's behaviors and contributions (e.g. the number of posts, posting frequency, comments, and feedback) to each online discussion can be recorded (Brady, Holcomb and Smith, 2010). An instructor can further utilize the information transparency powered by social technology to play effective facilitator roles in each online discussion.

However, in order to utilize social technology as an effective case-based learning tool an instructor needs to remove some barriers to its implementations. One barrier is the absence of existing social capital in a newly established class. Social capital begets social capital. If an instructor does not provide course materials and useful information about the studied cases, or no students initiate any discussion, the process of developing social capital can be halted. Students are motivated to engage in online discussion not only to learn more about the business case and related business concepts, but also earn a good grade (Su et al., 2005). A poorly designed grading rubric may not offer enough incentives for students to participate in the case-based learning. As the number of ideas generated, information overload becomes a new issue. It is imperative to have an effective mechanism to filter ideas and turn useful ideas into feasible solutions to resolving business problems. Class discussion dominated by a few students can lead to the ineffectiveness of case based learning. A fair assessment of contributions (e.g. the number of posts, and information quality of each post) can help avoid average students being intimated and overwhelmed by those active discussants. An instructor may also have difficulty of providing prompt personal response to all comments posted by students. Some students may feel isolated and ignored when their questions are ignored or responded late.

Despite these challenges, social technology enables students to share ideas, work in groups, converse with each other, and build relationships (Falloon, 2011). These characteristics indicate that online social technology is a potential tool for case-based learning. We therefore propose:

Hypothesis 1: Online social technology is an effective technology fit for case-based learning method

Improving Individual Learning Performance in Case-based Learning via Social Technology

Information technology is more likely to have a positive impact on individual job performance and be utilized if its capabilities match the tasks that the user must perform (Goodhue and Thompson, 1995). TTF measures are strong predictors of individual (Goodhue and Thompson, 1995) and group (Zigurs and Buckland, 1998) job performance and IT utilization (Goodhue and Thompson, 1995). The finding is applicable to understanding electronic commerce systems. Social technology is one form of internet-based technology systems that warrant further investigation of TTF applicability in this emerging technology.

While each particular business case is unique and therefore merits its own unique assessment questions, two assessment techniques seem particularly appropriate for case based learning: (1) near knowledge transfer, and (2) far knowledge transfer.

Transfer of learning is the study of whether an individual would be able to transfer learning in one context to another context that shared similar characteristics (Thorndike and Woodworth, 1901). Transfer of learning is often conceptualized and categorized into near and far knowledge transfer in the management education.

Student projects, such as case report, require that each student team in a class propose different solutions to resolving practical problems in the business case. To properly assess the range of content knowledge learned by students, students would need to answer not only simple questions (e.g. facts about the case and major problems), but also sophisticated questions (e.g. suggest solutions as a protagonists). Simple questions can help assess the reading comprehension of students, whereas those challenging questions can assess skills, such as researching and critical analysis. Similar responses between student groups are often expected in their answers to simple questions. On the other hand, it is normal to receive completely different answers from student groups for complicated questions. We posit that by increasing learners' perceived task-technology fit they are more likely to improve their performance in both near and far knowledge transfers.

Hypothesis 2: The higher degree of task-technology fit perceived by online learners, the better learning performance in near knowledge transfer online social technology can help achieve.

Hypothesis 3: The higher degree of task-technology fit perceived by online learners, the better learning performance in far knowledge transfer online social technology can help achieve.

Increasing the Use of Social Technology in Case-based Learning via Social Technology

TTF construct is an important antecedent for system utilization (Dishaw and Strong, 1999). To encourage users to increase their usage of information systems, increasing the degree of task-technology fit for the adopted system is indispensible. Instructors have relied on a wide variety of eLearning systems to achieve different learning objectives. For instance, students can use online video tools (e.g. YouTube and Movie Maker) to make a group presentation (Green, 2008). An instructor can use RSS to keep students updated real time with the latest news, course announcements (Cong and Du, 2008), and course assignments (Duffy and Bruns, 2006). Podcasts can be used to engage students in mobile learning (Beldarrain, 2006). A right fit of learning technology can bolster not only an instructor's teaching effectiveness, but also students' learning interests (Singh, Mangalaraj, and Taneja, 2010). Social technology has the strength in helping students form in team and exchange ideas for rich learning experiences. If social technology is a good fit to help improve learning performance in the case-based learning, students shall feel encouraged to increase their usage.

Hypothesis 4: The higher degree of task-technology fit perceived by online learners, the more frequently they will use social technology to engage in case-based learning.

RESEARCH METHODOLOGY

A field experiment methodology was conducted because it has the merits of "gain insight *into methods of instruction*" (Asher, 1976). The exploratory nature of the study requires that variables (e.g., interaction modes and usage patterns) under investigation be carefully observed and interpreted. The setting for the field experiment is four information systems classes offered by a public university in Thailand. A total of 116 students in the college of business in this university were invited to spend fourteen days to read and discuss the Harvard business case "Apple Inc." on the social site (http://www.Edmodo.com). Instructor, course materials, learning content, and evaluation criteria were controlled to be the same in all four classes. A professional translator was used to translate English materials into Thai to help students in Thailand understand the learning materials. The instructor covered the four learning phases to all subjects. The subjects were introduced and explained the nature of the study. The source learning phases are: (1) introduction of Edmodo and case-related concepts, (2) student case analysis, (3) output generation and discussions, and (4) follow-up and evaluation. A survey was conducted with subjects to understand the influence of affective and social factors on their intention of using the social technology as a case method learning tool. We also monitored the usage behaviors (e.g. the number of messages posted, comments and responses and the frequency of access) on Edmodo and assessed on how the subjects utilized the technology to the given tasks.

DATA ANALYSIS AND RESULTS

Demographics

The demographic profiles are presented in Table 1. In total, we collected 116 surveys from the respondents.

Demographic Variables	Frequencies	Percent
1. Gender		
Male	41	35.34
Female	75	64.66
2. Major is expected to select (Choose more than one)		
Accounting	71	55.04
Management Information System	0	0.00
Marketing	19	14.73
Finance	36	27.91
International Business, Logistics and Transportation	3	2.33
Human Resource and Organization Management	0	0.00
Real Estate	0	0.00
Operations Management	0	0.00
3. Experience to use online Social Networking Site such as Facebook, Hi5, Twitter, YouTube		
Less than 1 year	5	4.31
1 to 2 years	32	27.59
2 to 3 years	30	25.86
3 to 4 years	15	12.93
4 to 5 years	17	14.66
More than 5 years	17	14.66
5. Experienced the Edmodo		
Less than 1 year	116	100.00
1 to 2 years	0	0.00
2 to 3 years	0	0.00
3 to 4 years	0	0.00
4 to 5 years	0	0.00
More than 5 years	0	0.00
9.Experienced to upload a photo on the Edmodo		
YES	110	88
NO	15	12

Table 1: Demographic profile

Reliability Assessment

Reliability was evaluated by assessing the internal consistency of the scale constructs using Cronbach's Alpha. An Alpha value of more than 0.5 is acceptable. The reliability for each construct demonstrates acceptable reliability levels (above 0.50), illustrated in Table 2.

Constructs	Cronbach' alpha coefficient
Technology Characteristics	
Sharing	0.640
Grouping	0.946
Conversation	0.849
Relationship	0.944
Perceived Task Technology Fit	0.909
Performance Impact	0.866
Utilization	0.799

Table 2: Reliability of the model constructs

Constructs		Mean	S.D.
Sharing	How often do you share your notes with other students?	3.88	0.62
	How often do you post assignments on Edmodo?	3.96	0.90
	How often do you use Library to support your learning?	3.58	1.17
Grouping	How often did you use Calendar to manage your group case discussion?	2.33	1.50
	How often did you use the Support Community to assist your study of the Apple business case?	2.62	1.52
Conversation	How often did you post information directly?	3.30	1.11
	How often did you check other students' postings?	3.58	1.02
	How often did you reply to other students' postings?	3.43	1.10
	How often do you use Grade book to check your grades?	4.09	0.80
Relationship	How often did you create a link to your posts?	2.50	1.29
	How often did you add your posts to library?	2.30	1.42
	How often did you try to increase the number of your connections with others?	2.48	1.52
Perceived Task Technology Fit	The functionalities of the social technology Edmodo were very adequate.	3.90	0.60
	The functionalities of the social technology Edmodo were very appropriate	4.02	0.65
	The functionalities of the social technology Edmodo were very useful	4.07	0.78
	The functionalities of the social technology Edmodo were very sufficient	4.06	0.70
	The functionalities of the social technology Edmodo made the task of studying the Apple business case very easy.	3.92	0.79
	In general, the functionalities of the social technology Edmodo were best fit for the task of learning IT-related business case	3.87	0.76
Performance Impact	Near knowledge transfer: score of quiz	4.44	0.68
	Far knowledge transfer: score of report	4.60	0.53
Utilization	How often do you type something about you on Edmodo Homepage?	4.12	0.59
	Approximately how many hours weekly do you spend on Edmodo to discuss the Apple business case with friends?	2.63	0.98
	How long have you used the online social technology Edmodo to study the Harvard business case: Apple Inc. in the past weeks?	2.54	0.96

Table 3: Composite Mean for Each Constructs
(The survey questions were adapted from Chen, C. C., Wu, J. & Yang, S. C. (2006))

Factor Analysis

All of the four variables (Technology Characteristics); Sharing, Grouping, Conversation and Relationship are valid according to Kaiser-Meyer-Olkin Measure of Sampling Adequacy as the value Sig. in the table KMO and Bartlett's Test. Since the value of the KMO measure of Sampling Adequacy has the significant value of 0.945 and 0.00 which is really high and the Sig.<0.05 which mean the 12 variables were group together into 1 single variable.

Factor	Factor Loading	Communalities
How often do you share your notes with other students?	0.922	0.850
How often do you post assignments on Edmodo?	0.921	0.848
How often do you use Library to support your learning?	0.919	0.844
How often did you use Calendar to manage your group case discussion?	0.909	0.826
How often did you use the Support Community to assist your study of the Apple business case?	0.901	0.812
How often did you post information directly?	0.850	0.722
How often did you check other students' postings?	0.815	0.665
How often did you reply to other students' postings?	0.800	0.641
How often do you use Gradebook to check your grades?	0.739	0.546
How often did you create a link to your posts?	0.564	0.318
How often did you add your posts to library?	0.544	0.296
How often did you try to increase the number of your connections with others?	0.496	0.246
Eigenvalues	7.615	
% Variance	63.462	
Cumulative variance	63.462	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.945		
Bartlett's Test of Sphericity: Approx. Chi-Square = 1207.244 , df = 66, Sig. = 0.00		

Table 4: Factor Analysis

The analysis of Perceived Task Technology Fit the MKO Measure of Sampling Adequacy as the value Sig. in the table KMO and Bartlett's Test. Since the value of the KMO measure of Sampling Adequacy has the significant value of 0.865 and 0.00 which is really high and the Sig.<0.05 which mean the 6 variables were group together into 1 single variable the 6 variables are

Factor	Factor Loading	Communalities
The functionalities of the social technology Edmodo were very adequate.	0.863	0.645
The functionalities of the social technology Edmodo were very appropriate	0.838	0.698
The functionalities of the social technology Edmodo were very useful	0.835	0.745
The functionalities of the social technology Edmodo were very sufficient	0.834	0.695
The functionalities of the social technology Edmodo made the task of studying the Apple business case very easy.	0.812	0.660
In general, the functionalities of the social technology Edmodo were best fit for the task of learning IT-related business case	0.803	0.703
Eigenvalues	4.146	
% Variance	69.098	
Cumulative variance	69.098	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.865		
Bartlett's Test of Sphericity: Approx. Chi-Square = 430.002, df = 15 , Sig. = 0.00		

Table 5: The analysis of Perceived Task Technology Fit the MKO Measure of Sampling

The analysis of Performance Impact the MKO Measure of Sampling Adequacy as the value Sig. in the table KMO and Bartlett's Test. Since the value of the KMO measure of Sampling Adequacy has the significant value of 0.500 and 0.00 which is really high and the Sig.<0.05 which mean the 2 variables were group together into 1 single variable the 2 variables are

Factor	Factor Loading	Communalities
Far knowledge transfer: score of report	0.946	0.894
Near knowledge transfer: score of quiz	0.846	0.794
Eigenvalues	1.789	
% Variance	89.429	
Cumulative variance	89.429	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.500		
Bartlett's Test of Sphericity: Approx. Chi-Square = 110.381, df = 1 , Sig. = 0.00		

Table 6: The analysis of Performance Impact the MKO Measure of Sampling Adequacy

The analysis of Utilization the MKO Measure of Sampling Adequacy as the value Sig. in the table KMO and Bartlett's Test. Since the value of the KMO measure of Sampling Adequacy has the significant value of 0.550 and 0.00 which is really high and the Sig.<0.05 which mean the 3 variables were group together into 1 single variable the 3 variables are

Factor	Factor Loading	Communalities
How much personal information do you fill out in the Personal Profile on Edmodo?	0.960	0.318
Approximately how many hours weekly do you spend on Edmodo to discuss the Apple business case with friends?	0.949	0.900
How long have you used the online social technology Edmodo to study the Harvard business case: Apple Inc. in the past weeks?	0.564	0.921
Eigenvalues	2.139	
% Variance	71.298	
Cumulative variance	71.298	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.550		
Bartlett's Test of Sphericity: Approx. Chi-Square = 258.929, df = 3 , Sig. = 0.00		

Table 7: The analysis of Utilization the MKO Measure of Sampling Adequacy

Regression Analysis

Dependent: Perceived Task Technology Fit

Independent	Standardized Coefficients Beta	t	Sig.
Constant		15.4	0.878
Technology Characteristics	68.6	9.80	**0.000***
* p < 0.05, R^2 = 0.471			

Table 8: The Influence of factor on the Perceived Task Technology Fit of the Edmodo

Dependent: Performance Impact

Independent	Standardized Coefficients Beta	t	Sig.
Constant		0.083	0.934
Perceived Task Technology Fit	0.354	4.026	**0.000***
* p < 0.05, R^2 = 0.125			

Table 9: The Influence of factor on the Performance Impact of the Edmodo

Dependent: Utilization

Independent	Standardized Coefficients Beta	t	Sig.
Constant		0.072	0.943
Perceived Task Technology Fit	0.052	0.550	0.584
* p < 0.05, R^2 = 0.003			

Table 10: The Influence of factor on the Utilization of the Edmodo
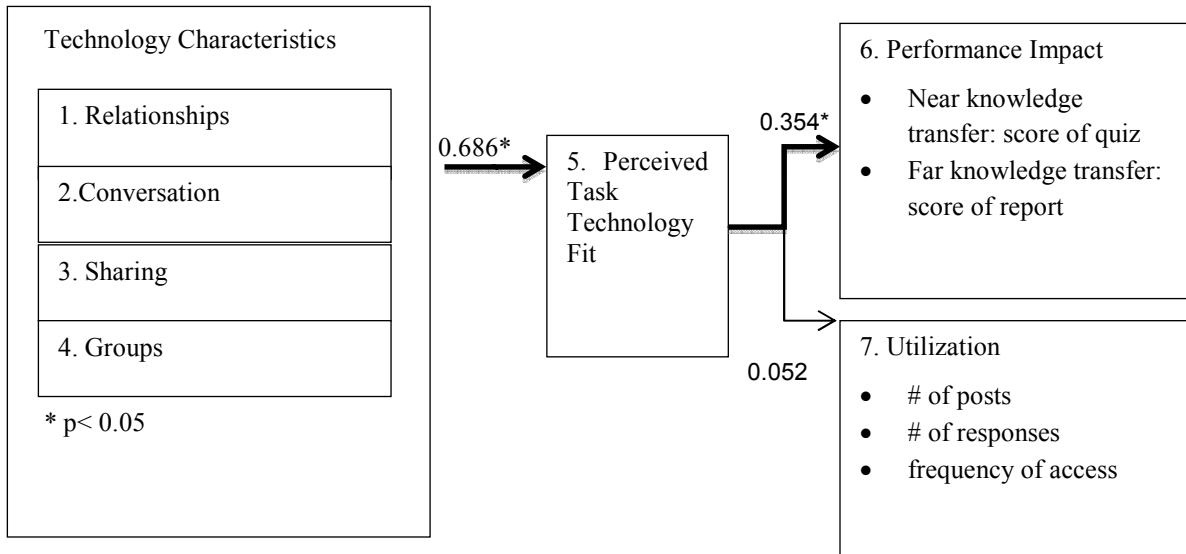
Figure 1: Research Model

DISCUSSION

Effective use of social technology to support case-based learning relies on the cultivation of social factors, such as sharing, grouping, conversation, and relationship, in an online community (Hu and Gollin, 2010).   Subjects in this study reported that the presence of these social factors in an online learning community could lead to increased TTF, thereby improving individual and group learning performance. This finding affirms the importance of social factors in delivering effective e-learning programs in addition to the presence of technical factors (Wu and Hwang, 2010).

However, a closer examination of these four social factors shows that sharing is the only factor having significant impact on TTF construct. Although relationship and grouping factors have positive effect on TTF, their influence is not significant and the relationship factor seems to potentially have a higher influence on TTF than the grouping factor does. Contrary to our expectation, the conversation factor seems to have negative influence on TTF.   The conversational feature of social technology may distract students from learning business cases and warrants special attention from instructors.   Student attitude is a stronger predictor for the use of social technology than perceived ease of use, perceived usefulness, and subjective norms in the higher education context (Shittu et al. 2011). Using social technology as a case-based learning tool may require extra efforts of influencing a student's attitude toward the technology. An instructor may want to clearly explain to students the importance of social factors in order to improve the perceived TTF.

Students were paired to study business cases via social technology. To encourage students to spend time and efforts in using social technology, a business case and related course materials were posted on Library for students to access. Students report that Library is an important feature for them to have a kick start in the learning process. During the learning process, students have frequently shared notes and assignments with each other. These two features have helped students exchange and share knowledge to effectively acquire IT concepts and apply them to solve practical problems related to business case.

However, students did not heavily use the Calendar and Support Community features to manage the grouping process. Students might choose their commonly adopted alternative technologies (e.g. Google Calendar, and email) to perform the grouping activity. Students play passive roles in conversing with others during the case discussion. For instance, most students choose to check students' postings without posting information and replying to other students' postings on Edmodo. Very few students spent efforts in extending their relationships with others by adding a link to their posits, and adding posts to the Library. Over the course of case discussion, course materials in Library remained largely unchanged.

This study shows that subjects who have high perception about the usefulness of social technology to learn business cases can lead to improved learning performance in both near and far knowledge transfers. This finding corroborates with previous study demonstrating the importance of increasing the degree of fit between task requirements and technological features in order to increase performance impacts (Cane and McCarthy, 2009).

Contrary to our expectation, students are not necessarily encouraged to use social technology as a tool to learn business cases even though they expressed that this technology would be a good fit for this task. Social relationships, task characteristics, and their interactions are required to instrumentally determine the usage of social technology (Koo, Wati, and Jung, 2011). The absence of those social factors may confound the direct relationship between TTF and social technology utilization. An instructor may want to invest time in building social factors (e.g. trust, conversation, grouping) in order to increase the actual use of social technology in learning business cases by students.

LIMITATIONS AND FUTURE RESEARCH

Although students had two weeks to participate in the field experiment and earn extra credits, they might need longer time to establish social factors, such as building trust, establishing a pattern of team communication, and grouping dynamics. A longitudinal study (a semester-long course design) may need to be setup in order to better assess the influence of social factors on students' TTF for the use of social technology for case-based learning, thereby advancing their understanding of near and far knowledge.

A Harvard business case on Apple Inc. was adopted and translated for students to improve their comprehension. Students needed to answer some specific questions related to this business case. Although significant relationships were established between TTF and learning effectiveness in near and far knowledge transfer, generalizing the finding to other business cases warrants careful interpretations. Future research may want to investigate more cases and compare them by using the same assessment tool. The ability of replicating the finding can ensure that a proper generalizability be achieved.

We asked students to self-report their usage of social technology in a survey. The actual social technology usage was not monitored to reflect the actual use of social technology. Using the survey data as a surrogate might not accurately detect the relationship between TTF and social technology usage. Future research may want to consider adopting the actual data to better assess the relationship.

THEORETICAL AND PRACTICAL IMPLICATIONs

This study makes two major contributions to the current TTF theory. First, we investigate the applicability of TTF theory in understanding the use of social technology in learning business cases related to IT concepts. Second, four social factors, including sharing, trust, conversation, and grouping, are used as social technology characteristics and antecedents for the TTF measure. Findings of this study suggest that TTF theory be used as an effective theory to help better understand not only the user behavior but also the usefulness of social technology as a case-based learning tool. However, TTF theory may not be able to fully capture the complexity of social technology adoption in the case-based learning context. Attitude, perceived usefulness, perceived ease of use, self-efficacy, and computer efficacy may also affect the intention of students to adopt social technology to learn business cases. Therefore, it is important to integrate TTF with other technology adoption theories, such as Technology Adoption Model (TAM), to better uncover the complexity of social technology adoption for case-based learning.

Students participated in this study do show significantly improved learning performance in learning factual knowledge, as well as solving practical business problems related to the studied business case. However, not all social factors exhibit significant influences on students' perceived TTF, thereby contributing to the decreased use of social technology. Future study may want to explore ways to effectively build social factors in the online learning community. For instance, a grading rubric can be designed to reward students who post messages and respond to other students' posts. If encouraged properly, students may also be motivated to experiment with new social technology features, and share notes and useful learning materials related to the business case in the Library and other supporting areas.

CONCLUSION

College students are embracing social technology in their daily life. However, adopting the technology as a pedagogical tool, particularly in learning business cases, is still at the early adoption phase. This exploratory study investigates the potential of using social technology to help students learn business case related to information technology from the task-technology fit perspective. A two-week experimental study was conducted with college students in a Thai university to assess their social technology adoption behavior and the fit of using the technology to enhance their learning of business cases. Our findings suggest that social technology be used as a fit learning tool to improve students' understanding of business cases. The higher perceived task-technology fit, the better learning performance in both near and far knowledge can be achieved via the social technology. An instructor may want to exploit ways to increase students' TTF fit by incorporating social factors into the online learning community to not only enhance students' learning but also increase the actual use of social technology in

learning business cases. Instructors and administrators in the college of business may need to ready for redesigning their business curriculum as more evidence show that social technology is an effective pedagogical tool for case-based learning.

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