

The Power of “We”: Using Instant Messaging for Student Group Project Discussion

Aaron X.L. Shen

University of Science and Technology of China—City
University of Hong Kong Joint Advanced Research
Center, SIP, Suzhou, P. R. China
xlshen@mail.ustc.edu.cn

Matthew K.O. Lee

Department of Information Systems
City University of Hong Kong, Hong Kong
fbmatlee@cityu.edu.hk

Christy M.K. Cheung

Department of Finance and Decision Sciences
Hong Kong Baptist University, Hong Kong
ccheung@hkbu.edu.hk

WeiPing Wang

University of Science and Technology of China—City
University of Hong Kong Joint Advanced Research
Center, SIP, Suzhou, P. R. China
wpwang@ustc.edu.cn

Abstract

Online group work has been identified as an important issue in Web-based education for a long time. With the prevalence of instant messaging in adolescents, more and more students opt to choose this emerging synchronous communication medium for online group project discussion. In this paper, we-intention to use instant messaging for online group project discussion was examined and a research model of we-intention was proposed and empirically tested with 482 students in China. The research model explains 43.2% of the variance in we-intention and attitude, anticipated emotions, group norms and social identity are found statistically significant. Implications for both researchers and practitioners are discussed.

Keywords: We-Intention, Social Computing Technology, Instant Messaging, e-learning, e-collaboration, synchronous communication medium, theory of reasoned action, goal-directed emotion, social influence

1. Introduction

Instant messaging (IM) has become an important part of everyday life. The number of its users is expected to grow from 432 million in 2006 to 650 million in 2010 [24]. A recent study shows that young people are highly active users

of social computing technologies [5]. According to a new national survey of teenagers conducted by Pew Internet & American Life Project [22], more than half (55%) of all of online American youths ages 12-17 use an online social networking sites and 48% of teens visit social networking websites daily or more often.

Because of the high degree of penetration and adoption of IM among young people, IM is potentially an excellent medium for teaching and learning. Particularly, research in education suggests that social and informal communication among students is an essential element in learning [30]. Researcher in Information Systems also found that instant messaging possesses the potential to boost student participation in online learning environment [16] [17] and raise student effort in group work [10] [25].

Compared with conventional asynchronous learning technologies, including email, discussion forums and mailing lists, instant messaging has several merits that are especially suitable for task planning, scheduling, coordination and group discussion in educational settings. For example, it allows users to stay connected with their classmates anywhere, anytime at a very low cost. More importantly, it facilitates a real-time communication among all group members. Instant messaging also contains a number of unique features, such as buddy list, presence awareness, message conferencing, application sharing and white boarding, which greatly support student online group project discussion.

Despite the importance and potential of using instant messaging to support group learning, its value will not be realized if students do not accept it for group project discussion. Prior studies in information systems (IS) research mostly employed individual intention (I-intention) as a precursor to adoption and usage behavior. However, the traditional I-intention approach may not provide enough insights in explaining the current context of collective acceptance of instant messaging, where students' adoption decision depends on their classmates' simultaneous adoption of instant messaging for online group project discussion. Recent research on the concept of "we-intention" in the fields of philosophy and social psychology has provided a useful basis for understanding student collective use of instant messaging in online group project discussion. Contrary to individual intention, "we-intention" highlights a commitment of an individual and an agreement between all participants to engage in a joint action [29]. To address these issues, this study attempts to investigate students' we-intention in using instant messaging for online group project discussion.

In the next section, the theoretical background of this study is presented. The research model and hypotheses are provided in section 3. The research method and the results are reported in sections 4 and 5 respectively. This paper concludes with the implications for both research and practice.

2. Theoretical Background

There is an unexpectedly broad research topic related to the use of the Internet for learning and teaching [21]. In recent year, researchers focused specifically on the use of social computing technologies (in particular, instant messaging) in facilitating collaborative work. In this section, studies on the use of instant messaging in e-learning are first discussed. The theoretical foundation for the current study is then reviewed. Specifically, the concept of we-intention, the theory of reasoned action, the emotions research and the Kelman's social influence framework are discussed.

2.1. Instant Messaging for e-Collaboration

Previous studies showed that instant messaging enhanced participation and

collaboration in learning environment. For example, Hrastinski [17] studied the impact of instant messaging on student participation. Students who adopted instant messaging in a distance learning course had a higher level of participation than those who did not adopt. Similarly, based on the responses from 43 students in four online courses of two Mexican universities, Contreras-Castillo et al. [9] demonstrated that instant messaging increased collaboration among course participants and reduced students' feeling of isolation. Rossade et al. [25] further indicated that the social presence awareness, emotional well-being and sense of belonging can be well supported by instant messaging in a distance language learning environment. Nicholson [23] found that students who used instant messaging in the Web-based distance education course felt "a stronger sense of community" than those who did not use IM. In addition, Spencer and Hiltz [27] investigated the use of synchronous chat in online course. They found that the student participation rate varied from 5% to 50%. Most instructors also had positive feelings toward the use of synchronous chat sessions.

2.2. We-intention

We-intention can be considered as the intention to participate in a group and perform a group activity in which the participants perceive themselves as members of the group [2]. There are several features distinguishing we-intention from traditional I-intention. First, there is a difference in goal achievement process. In the mode of we-intention, the intention content is collectively accepted by each participant who acts as a member of the group. In contrast, the content is privately accepted by an individual in the mode of I-intention. Second, there is a difference in reasons for performing an action. Participants with we-intentions are motivated by group reasons, whereas individuals with I-intention are primarily motivated by private reasons. Third, there is a difference concerning the commitments and control. Under an we-intention context, participants have a collective commitment and a shared authority over the joint action. This is contrary to I-intention situation, where an individual is privately committed to and has full control over the action. Fourth, there is a difference related to the satisfaction condition of the intention content. It is obvious

that we-intention has necessary simultaneous satisfaction as its special feature.

2.2. Theory of Reasoned Action

The theory of reasoned action (TRA) [12] provides a theoretical grounding for the current study on the use of instant messaging for student group project discussion. TRA has been widely used by IS researchers to understand information technology adoption and usage behavior. In TRA, an individual's behavior is affected by behavioral intention, which in turn, is predicted by attitude toward the behavior and subjective norms surrounding the performance of the behavior. Although the TRA is found useful in explaining human behavior, it has often been criticized for the ignorance of affective attitude, as well as the weak predictive ability of subjective norms [1] [13]. To complement the weaknesses of the TRA, this study extends the theory by adding some important concepts from the goal-directed emotions literature and Kelman's social influence framework.

2.3. Goal-directed Emotions

Attitude in the theory of reasoned action is explicitly defined as "a person's general feeling of favorableness and un-favorableness toward some stimulus object" [12] (p. 216). This definition basically emphasizes the instrumental consequences of behavior but overlooks the affective consequence of behavior. The affective component of attitude refers to "emotions and drives engendered by the prospect of performing a behavior" [13]. The necessity of including affective attitude rests with the fact that decision making involves both reasoning and feeling.

One response to this observation has been to include goal-directed anticipated emotions as predictors of behavioral intention. Anticipated emotions can be defined as affective responses where the individual imagines the emotional consequence of goal achievement and goal failure before deciding to act [3]. The rationale for the effects of anticipated emotions is based on the argument that people will consider emotional consequence before they decide to act in goal-directed situations. Recent research demonstrated that both positive and negative anticipated emotions are important determinants of behavioral intention [7] [3].

2.4. Social Influence Framework

Davis et al. [11] emphasized the role of social influences in information technology acceptance and usage behavior and suggested that Kelman's social influence framework can be considered as a theoretical base for developing knowledge in this area. Kelman [19] distinguished three different processes of social influences, including compliance, identification, and internalization. Compliance occurs when an individual accepts the influence to get support or approval from significant others. Subjective norms in the theory of reasoned action are often used to reflect the influence of social normative compliance. Identification occurs when an individual accepts the influence to establish and maintain a satisfying self-defining relationship to another person or group. Internalization occurs when an individual accepts the influence because of the similarity of one's goals or values with that of their referent group.

3. Research Model and Hypotheses

Figure 1 depicts the research model used in this study. The model integrates the perspectives of goal-directed emotions and social influence into the theory of reasoned action (TRA). The model includes attitude and anticipated emotions, and different dimensions of social influence as significant determinants of we-intention to use instant messaging for online group project discussion.

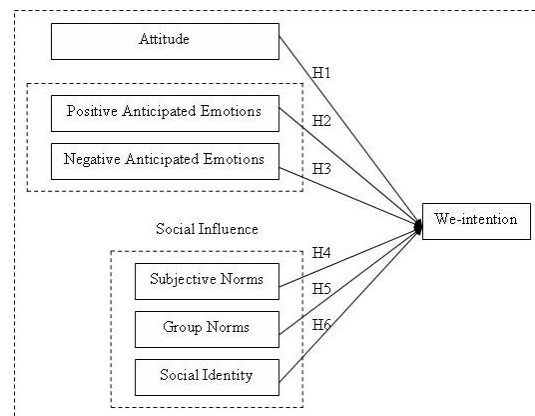


Figure 1. The research model

3.1. The Role of Attitude and Anticipated Emotions

Using instant messaging for online group project discussion is a collective action. An individual cannot use this technology for

collaboration if he/she finds that his/her classmates do not adopt this collaborative technology. Compared with I-intention approach, we-intention captures the perception of “us” and collective commitment of students in using instant messaging for online group project discussion. In this sense, traditional individual intention is replaced by we-intention to use instant messaging for online group project discussion in the current study.

Consistent with the theory of reasoned action, intention is determined by attitude. In the current content, attitude toward the use of instant messaging is an important factor determining a student’s we-intention to use instant messaging for online group project discussion. Thus:

H1: Attitude toward the use of instant messaging will have a positive impact on a student’s we-intention to use instant messaging for online group project discussion.

Literature on the goal-directed emotions suggested that both positive anticipated emotion and negative anticipated emotion should be considered in understanding user behavior. Positive anticipated emotion refers to the affective reactions toward successful use of instant messaging for group work, while negative anticipated emotion results from the unsuccessful usage experience.

Consistent with previous literature, if students form positive emotions toward the use of instant messaging, an we-intention to use instant messaging for online group project discussion will be formed. In contrast, if students have negative emotions toward the unsuccessful use of instant messaging, they will form an we-intention to use instant messaging for online group project discussion to avoid this negative emotions. Therefore:

H2: Positive anticipated emotions from successful use of instant messaging will have a positive impact on a student’s we-intention to use instant messaging for online group project discussion.

H3: Negative anticipated emotions from unsuccessful use of instant messaging will have a positive impact on a student’s we-intention to use instant messaging for online group project discussion.

3.2. The Role of Social Influence

The social influence underlying the compliance process is represented by subjective norms in this study. Subjective norms have received considerable empirical support as an important antecedent of behavioral intention. In the current context, if students believe the use of instant messaging for online group project discussion would bring a favorable reaction from their referent group, such as instructors, classmates or parents, they will be more likely to have a higher degree of we-intention to use it. Therefore,

H4: Subjective norms concerning the use of instant messaging will have a positive impact on a student’s we-intention to use instant messaging for online group project discussion.

Internalization process is represented in the current research through the effects of group norms. Social influence is captured by the similarity of one’s goals or values with that of their referent group. In the current study, if students realize that all group members share one or more common goals or values, such as striving for better grades and gaining practical experience, they will have a higher degree of we-intention to use instant messaging for online group project discussion. Therefore,

H5: Group norms regarding the online group will have a positive impact on a student’s we-intention to use instant messaging for online group project discussion.

The third mode of social influence examined in this study is identification, which is characterized by social identity. Social identity theory [28] was originally used to explain the psychological basis of intergroup discrimination. The core assumption behind social identity theory is that a person thinks, feels and acts on the basis of a “group level of self” (as a member of the group) instead of a “personal self” [31]. Therefore, social identity captures the aspects of identification with a community in the sense that an individual categorizes self as a member of this community. Previous studies in distance education research have found that students’ sense of belonging may be well supported with the use of instant messaging [25]. In this study, it is believed that the positive self-enhancement with the group can promote the we-intention to use instant messaging for online group project discussion. Therefore:

H6: Social identity with the online group will have a positive impact on a student's we-intention to use instant messaging for online group project discussion.

4. Research Method

The purpose of this study is to examine we-intention to use instant messaging for online group project discussion. Data collection method, measures, and survey response are reported in this section.

4.1. Data Collection

The target respondents of this study are university students who have ever used instant messaging for online group project discussion (e.g., using instant messaging to discuss group projects or class assignments together). The current study was conducted in a university in China during May to July 2006. Both a pen-and-paper survey and an online survey were used for data collection. This mixed mode approach mitigates the coverage errors or other biases resulting from data collection method [33]. Participation in this study was voluntary yet motivated by a lucky draw among successful respondents.

4.2. Measures

All measures had been validated in prior studies (as shown in Table 1). Minor changes in the wordings were made so as to fit of the specific context of investigation. Since the study targeted students in Mainland China, the questionnaire was translated into Chinese. To ensure the consistency between the Chinese and English version of the questionnaire, a backward translation method was used.

A screening question was employed to identify respondents who have used instant messaging for online group project discussion. This study was introduced as "opinion survey". For these respondents who have ever used instant messaging for online group discussion or assignment-related activities with their classmates, they were asked to "imagine that you are using instant messaging to discuss a group project/assignment with the group of classmates that you regularly work with". Respondents were then asked to "picture briefly in your mind the name and image of each group member and write your nickname and their nicknames in the

table below". These instructions were designed to capture the groups with which the respondents develop we-intentions to use instant messaging together for online group project discussion.

4.3. Responses

A group of business students in a local university in Mainland China were invited to participate in a pen-and paper survey. Students from six randomly selected classes were asked to complete the questionnaire. Before they filled in the questionnaire, the purpose and the scenario of the survey was first explained. Only students who have used instant messaging for online group discussion with their classmates were asked to fill in the questionnaire. A total of 301 usable questionnaires were returned.

A self-administrative online questionnaire was also posted in the Bulletin Board System (BBS) of the university. Online survey design has the advantages of allowing electronic input and reducing response bias [6], and facilitates data collection from a large amount of respondents. A total of 181 usable questionnaires were collected in this phase.

When compared the two sets of data, there was no difference between the two groups of respondents. The two data sets were then combined for further investigation. The final sample consists a total of 482 respondents, out of which 313 were male (64.9%) and 169 were female (35.1%). A large majority (60.6%) of the respondents aged between 21 and 25. On the whole, the respondents were relatively experienced in using instant messaging and spent more than one hour on instant messaging per day (85.5%). Table 2 provides a summary of overall sample characteristics.

5. Results

Partial Least Squares (PLS) was used to test the proposed research model. The PLS procedure [34] is a second-generation multivariate technique which can assess the measurement model and the structural model simultaneously in one operation. Following the two-step analytical procedures [15], the measurement model was first examined and then the structural model was assessed.

5.1. Measurement Model

Table 1. Summary of psychometric properties of the measures

Construct	List of items	Loading	Source
Attitude (ATT) $\alpha=0.892$ $\beta=0.676$	Using instant messaging for group work during the next 2 weeks would be: (seven-point semantic scales) ATT1: foolish/wise ATT2: harmful/beneficial ATT3: bad/good ATT4: punishing/rewarding	0.863 0.846 0.885 0.679	[4]
Positive Anticipated Emotions (PAE) $\alpha=0.932$ $\beta=0.661$	If I am able to use instant messaging for group work during the next 2 weeks, I will feel: (seven-point “not at all-very much” scale) PAE1: not at all excited/ excited very much PAE2: not at all delighted/delighted very much PAE3: not at all happy/happy very much PAE4: not at all glad/glad very much PAE5: not at all satisfied/satisfied very much PAE6: not at all proud/proud very much PAE7: not at all self-assured/self-assured very much	0.862 0.873 0.842 0.825 0.804 0.737 0.738	[3]
Negative Anticipated Emotions (NAE) $\alpha=0.962$ $\beta=0.718$	If I am unable to use instant messaging for group work during the next 2 weeks, I will feel: (seven-point “not at all-very much” scale) NAE1: not at all angry/angry very much NAE2: not at all frustrated/frustrated very much NAE3: not at all guilty/guilty very much NAE4: not at all ashamed/ashamed very much NAE5: not at all sad/sad very much NAE6: not at all disappointed/disappointed very much NAE7: not at all depressed/depressed very much NAE8: not at all worried/worried very much NAE9: not at all uncomfortable/uncomfortable very much NAE10: not at all anxious/anxious very much	0.813 0.867 0.802 0.786 0.871 0.839 0.887 0.876 0.869 0.858	[3]
Subjective Norms (SN) $\alpha=0.930$ $\beta=0.868$	SN1: Most people who are important to me think that I should/should not use instant messaging for group work sometime during the next 2 weeks. (seven-point “should-should not” scale) SN2: Most people who are important to me would approve/disapprove of me using instant messaging for group work sometime during the next 2 weeks. (seven-point “approve-disapprove” scale)	0.917 0.946	[4]
Group Norms (GN) $\alpha=0.898$ $\beta=0.814$	Using instant messaging for group work sometime during the next 2 weeks with the group of classmates you identified above can be considered as a goal. For each member in your group, please estimate the strength to which each holds the goal. (seven-point “weak-strong” scales) GN1: Strength of the shared goal by the self. GN2: Average of the strength of the shared goal for other members.	0.905 0.900	[4]
Social Identity (SI) $\alpha=0.908$ $\beta=0.623$	SI1: How would you express the degree of overlapping between your own personal identity and the identity of the group you collaborate with through instant messaging when you are actually part of the group and engaging in group activities? (eight-point “far apart-complete overlap” scale) SI2: Please indicate to what degree your self-image overlaps with the identity of the group of classmates as you perceive it. (seven-point “not at all-very much” scale) SI3: How attached are you to the group you collaborate with through instant messaging? (seven-point “not at all-very much” scale) SI4: How strong would you say your feelings of belongingness are	0.657 0.786 0.832	[4]

	toward the group? (seven-point “not at all-very much” scale)	0.840	
	SI5: I am a valuable member of the group. (seven-point “does not describe me at all-describes me very well” scale)	0.797	
	SI6: I am an important member of the group. (seven-point “does not describe me at all-describes me very well” scale)	0.813	
We-Intention (WE) $\alpha=0.905$ $\beta=0.827$	WE1: I intend that our group use instant messaging for group work together sometime during the next two weeks. (seven-point “disagree-agree” scale)	0.916	[4]
	WE2: We intend to use instant messaging for group work together sometime during the next two weeks. (seven-point “disagree-agree” scale)	0.903	

Table 2: Sample Characteristics

Characteristics	Number (N=482)	Percentage (%)
Age		
< 21	97	20.1%
21 – 25	292	60.6%
26 – 30	76	15.8%
>30	17	3.5%
Gender		
Male	313	64.9%
Female	169	35.1%
Experience with instant messaging		
<=2 Years	51	10.6%
2-5 Years	224	46.5%
>5 Years	207	42.9%
Time spent on instant messaging per day		
<1 Hour	70	14.5%
1-2 Hours	201	41.7%
>2 Hours	211	43.8%

Convergent validity was assessed by examining the composite reliability and the average variance extracted [15]. Composite reliability is the measurement for internal consistency. Average variance extracted indicates the amount of variance captured by a construct as compared to the variance caused by the measurement error. A composite reliability of 0.70 or above and an average variance extracted of more than 0.50 are deemed acceptable [14]. As shown in Table 1, all the measures exceed the recommended thresholds.

Discriminant validity indicates the extent to which a given construct differs from other constructs. To demonstrate the adequate discriminant validity of the constructs, the square root of the average variance extracted for each construct should be greater than the correlations between that construct and all other constructs

[14]. Table 3 presents the correlation matrix of the constructs and the square roots of the average variance extracted. The results suggest an adequate level of discriminant validity of the measurements.

5.2. Structural Model

The results of the analysis are depicted in Figure 2, which presents the overall explanatory power, the estimated path coefficients (all significant paths are indicated with asterisks), and the associated t-values of the paths. Test of significance of all paths were performed using the bootstrap resampling procedure. The model accounts for 43.2% of the variance in “we-intention to use instant messaging for online group project discussion”. The results show that positive anticipated emotions have the strongest impact on we-intention, with a path coefficient at 0.290, followed by social identity, group norms, attitude and negative anticipated emotions, with path coefficients at 0.190, 0.161, 0.139 and 0.132 respectively. However, subjective norms do not have a statistically significant impact on we-intention. One possible explanation is that the use of instant messaging among students for online group project discussion tends to be voluntary and many students seems to be proficient in using instant messaging before they pick it for group discussion. This is also consistent with prior research that has demonstrated subjective norms matter only when the technology in question was mandatory and users had limited technical experience [18] [32]. In addition, according to a reviewer's suggestion, people may not actually seriously approve or disapprove something like the use of which technology for online group project discussion. Therefore, the influence of subjective norms seems insignificant in the current context.

Table 3. Correlation matrix of the constructs

	ATT	PAE	NAE	SN	GN	SI	WE
ATT	0.822						
PAE	0.490	0.813					
NAE	0.102	0.253	0.847				
SN	0.191	0.171	0.001	0.932			
GN	0.387	0.419	0.116	0.124	0.902		
SI	0.510	0.600	0.104	0.172	0.489	0.789	
WE	0.452	0.571	0.258	0.118	0.443	0.525	0.909

Note: ATT=Attitude, PAE=Positive Anticipated Emotions, NAE=Negative Anticipated Emotions, SN=Subjective Norms, GN=Group Norms, SI=Social Identity, WE= We-Intention

*The bold numbers in the diagonal row are square roots of average variance extracted

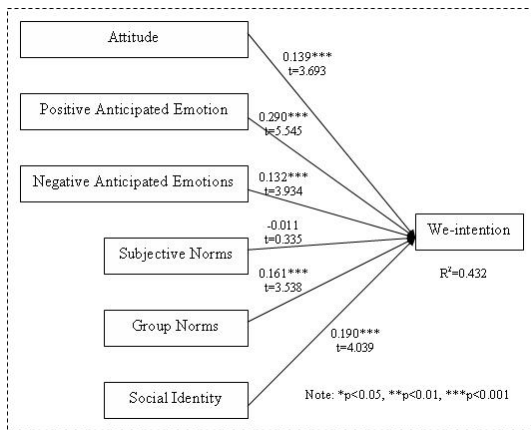


Figure 2. Results of research model

6. Discussion and Conclusion

Technology-supported learning becomes an integral part of education and training in higher educational institutions. There is a shift of focus in recent e-learning research, from traditional instructor-centered pedagogies to student-centered active learning, where students are encouraged to participate in online group project with their peers and learn collaboratively through online group discussion. In this regard, the answer to the question “What makes student group project discussion successful?” seems rather important and interesting. This study tries to address this question by investigating the role of instant messaging and the power of “we” in group learning behavior.

6.1. Limitations

Before highlighting the implications for research and practice, the limitations of this

study are first discussed. First, the survey was conducted in China. It is possible that culture may shape the formation of group we-intention to use instant messaging for group project discussion. Future cross-cultural studies should examine these speculations. Second, actual behavior (the use of instant messaging for group project discussion) was not examined. Therefore, a longitudinal study is highly recommended in the future. Third, some scales adopted from previous studies need further refinement (e.g., two-item scales). Future studies should continue to develop and validate measures for the study of IM in group work. Moreover, the effectiveness (e.g., user satisfaction and group performance) of using instant messaging for group project discussion should be examined. Finally, the current research model only explains 43.2% of the variance. Future research should extend this line of inquiry and apply the model in other group learning techniques and learning phenomena.

6.2. Implications for Research

The concept of we-intention is rather new in the IS field. Only very few studies have empirically tested the concept of “we” and applied the concept to study collaborative technologies [20] [8] [26]. The underlying rationale of using “we-intention” to examine the use of collaborative technologies is that the use of collaborative technology can make sense only when a group of individuals are ready to adopt and use the technology together. The current study extends this line of research and continues to examine the use of instant messaging in group project discussion.

The current study also contributes to existing social computing and e-collaboration research. This study adds to the limited research done on collaborative use of instant messaging for online group work and allows future research to build upon it. This study allows operationalization and validation of instruments in the research model. Finally, this study investigates the use of instant messaging in online group project discussion. As an informal synchronous learning medium, instant messaging is gaining widespread popularity among students. More research is needed to evaluate the potential benefits and barriers of using instant messaging in group learning.

6.3. Implications for Practice

While this study leads to several interesting implications for research, it is also relevant to instructors and academic institutions. This study examines how successful online group project discussion is realized. From an instructor perspective, a major implication of this study is that students' anticipated emotions and the internalization and identification with the learning group are important determinants of student participation in instant messaging usage behavior. Based on these findings, here are two important guidelines for instructors and course managers:

First, the significance of both positive and negative anticipated emotions illustrates that the decision regarding the use of instant messaging in online group project discussion is closely related to the expected results of usage behavior. Therefore, instructors and course managers should present and demonstrate some successful cases of using instant messaging in online group project discussion. Second, group norms and social identity also play important roles in determining students' we-intention to use instant messaging for online group project discussion. Students accept instant messaging for online group learning mainly because they believe that this is congruent with their own goals or values and they want to establish and maintain satisfying relationships with other classmates. Instructors and course managers thus should recommend some special features of instant messaging, like chat room, buddy list, and white boarding, to students to help them complete a group project collectively and build their identification with the learning group.

In summary, this study provides a new insight in understanding students' we-intention to use instant messaging for online group project discussion. As an important and interesting concept in explaining group learning phenomena, "we-intention" should obtain more attention in the future. In addition, future research also should continue this line of research by investigating other Internet-based learning technologies, such as wiki, weblog, and social networking services.

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