Chang, M. et al. (Eds.) (2019). Proceedings of the 27th International Conference on Computers in Education. Taiwan: Asia-Pacific Society for Computers in Education

Social Factors in the Usage Continuance of Instant Messaging for Group Collaboration

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Abstract: The ubiquity and mobility of mobile technologies have led to the proliferation of instant messaging apps, which have become a primary choice of communication mode among students. This trajectory gives birth to various affordances which presents opportunities for research on how these tools can support learning beyond the walls of traditional classrooms by facilitating group collaboration. While prior studies focused on examining the technological factors in the use of collaboration tools, other researches revealed that social factors are equally important. In this paper, we contribute to the dearth of research in exploring social dimensions as antecedents of usage continuance of collaboration tools. A total of 168 students participated in an empirical study which revealed social influence and social presence as predictors of positive attitude towards instant messaging tools for collaboration. Further analysis of data establishes social influence as the strongest indicator of usage continuance. However, contrary to prior research, social influence does not predict social presence. Future research, implications for the academe and limitations of the study are also discussed.

Keywords: Instant messaging, collaboration, social influence, social presence, theory of reasoned action

1. Introduction

In today's work environment, technology tools that foster collaboration and effective communication has become a necessity to accomplish tasks from teams composed of members from varied backgrounds (Orta-Castañon, Urbina-Coronado, Ahuett-Garza, Hernández-de-Menéndez, & Morales-Menendez, 2018). In response, higher educational institutions have incorporated computer-mediated collaboration software within their technology infrastructure to ensure that the future workforce will be adept to these technologies (Yadegaridehkordi, Shuib, Nilashi, & Asadi, 2019). Recent observations indicate that the mobile phone ownership is on the rise and that majority of users belong to the younger generation. In addition, access to the Internet is more affordable which renders the use of mobile apps as an integral part of the daily activities of today's digital natives (Bere & Rambe, 2019; Graham & Jones, 2019).

The numerous benefits acquired from mobile phone ownership and the affordances in the use of instant messaging apps attract students from higher education (Graham & Jones, 2019). As a result, they are considered the most active users of these technologies through activities related to learning such as knowledge sharing, collaboration and communication (Bere & Rambe, 2019). Aside from students, faculty members have also realized the value of the use instant messaging apps in cascading valuable knowledge outside the physical boundaries of the classroom. The work by Murire and Cilliers (2017) reveal that frequent communication and interaction between the faculty and students through digital communication tools can improve the learning experience resulting to better academic performance. An important feature of these communication apps is the ability to create groups which promotes collaboration among learners in the context of education (Bere & Rambe, 2016).

Despite the numerous benefits of collaboration technologies in education, detriments exist in its adoption and continued usage (Ifinedo, 2018). This paper contributes to the scholarship in several avenues. First, prior literature on the use of instant messaging tools are focused on the adoption phase and conducted primarily on developed economies resulting to a limited research investigating its usage continuance from the perspective of a developing economy (Mouakket, 2019). Second, prior research have highlighted the critical role of social factors in the use of collaboration technologies in groups

(Graham & Jones, 2019) and rather than using technology dimensions in the post-adoption of instant messaging tools, this study tests the influence of social dimensions in the continued use of this technology.

Students enrolled in a university course that requires them to work in groups to design and develop an information system for an existing organization were invited to participate in an online survey. Capturing the social aspects such as social influence and social presence of the continued use of collaboration for group work among learners is imperative to the successful integration of these technologies in the modern work environment (Huang, 2016). A total of one hundred sixty eight students (168) enrolled in the course participated in the study and the results were analyzed using Partial Least Squares (Hair, Hult, Ringle, & Sarstedt, 2014; Wong, 2013). In the next sections, discussions of related literature on the use of instant messaging tools in higher education, the theoretical guidance adopted and hypothesis development are presented. Implications and limitations are acknowledged after the discussion of the results.

2. Related Studies and Theoretical Framework

In higher education, collaboration technologies were found to be effective in accomplishing academic requirements involving group tasks. The study of Gronseth and Hebert (2019) reveal that mobile instant messaging tools are preferred by students over other collaboration technologies embedded in learning management systems due to its ease of use and accessibility. Widely available mobile instant messaging tools appear to be popular among students as a collaboration tool. For example, a study on the use of WeChat among graduate students found that there is a strong sense of collaboration among peers. The group features in this popular app allows participants to express themselves freely, establish new relationships and continue to collaborate beyond the course (Tang & Hew, 2018). The interactivity among users in a group represents one of the primary motivators in the use of instant messaging tools. For example, in a study investigating the use of WhatsApp by undergraduate students, online discussions and sharing of resources were some of the advantages identified as activities that support academic learning (Gon & Rawekar, 2017). These findings are consistent with a prior study by Bouhnik and Deshen (2014) in their investigation of the use of WhatsApp by students and teachers in high school. While interest from the scholarship on the use of instant messaging as a collaboration tool has increased in recent years, studies that investigate the social behavioral dimensions of its usage is scant. Majority of the studies have taken the technological and academic perspectives in its use, neglecting the importance of social factors in online collaboration through these technologies.

Continued use of technology is a body of discipline within information systems research that puts emphasis on investigating individual behaviors use of technology after its initial adoption. According to the Theory of Reasoned Action or TRA, external determinants can predict the behavioral intention of an individual to perform an action such as attitude and subjective norms (Ajzen, 1975). Attitudes are behavioral beliefs that refer to the result of a person's evaluation of the consequences of performing a specific act. Subjective norms can take a form of a person's perception on what people around him thinks about performing a specific act (Yousafzai, Foxall, & Pallister, 2010). While these determinants represent the two salient dimensions of behavioral intention to commit an act in TRA, scholars have suggested operationalizing external variables to improve the theoretical precision of TRA (Mishra, Akman, & Mishra, 2014; Ortiz De Guinea & Markus, 2009). In the context of this study, instant messaging tools offer features that cultivate digital interaction among users that can invoke social presence (Bere & Rambe, 2016). It is defined as the perceived degree of salience of an individual in computer mediated collaboration (Graham & Jones, 2019). Prior studies have argued that social presence is an important determinant which influence the attitude of students in the usage continuance of collaboration technologies among students (Huang, 2016). This construct is operationalized to influence attitude which along with social influence determines the behavioral intention of students to use instant messaging for group collaboration as shown in Figure 1 – Theoretical Framework.

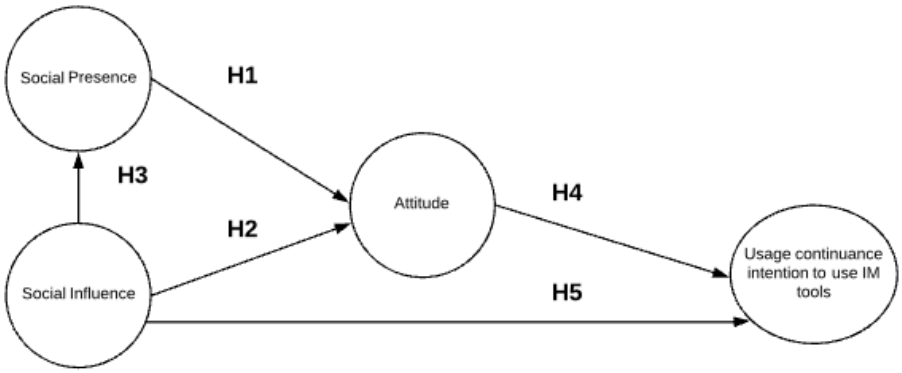

Figure 9. Theoretical Framework

In the domain of education, prior research has explored factors that positively influence the usage continuance of collaboration technologies. Social presence (SP) was found to positively influence the attitude of learners towards the continued use of collaboration technologies (Huang, 2016). Likewise, social influence (SI) is also a strong determinant of attitude in the continued use of tools that support teamwork (Huang, 2016; Olschewski, Renken, Bullinger, & Möslein, 2013). In a virtual environment, individuals who are considered important by users may have a direct effect on their perceived social presence (Huang, 2016). Lastly, attitude (ATT) and social influence (SI) were found to have strong positive influence in the behavioral intention to use or continually use technologies as originally argued by TRA (Lu, Zhou, & Wang, 2009; Mishra et al., 2014). Given the findings of prior research, we offer the following set of hypotheses:

H1 – Social Presence (SP) has a positive influence on Attitude (ATT).
H2 – Social Influence (SI) has a positive influence on Attitude (ATT).
H3 – Social Influence (SI) has a positive influence in Social Presence (SP).
H4 – Attitude (ATT) has a positive influence on the Usage Continuance (UC) intention to use instant messaging tools for collaboration.
H5 – Social Influence (SI) has a positive influence on the Usage Continuance (UC) intention to use instant messaging tools for collaboration.

3. Methodology

Due to its fit with the research objectives of this investigation and the presence of constructs operationalized in this study, a scaled-down questionnaire was adopted from the study of Huang (2016) to test the hypotheses. Students enrolled in a university located in the Philippines were invited to participate in the study by answering an online survey and informed consent was solicited. The students are enrolled in a course that relies heavily on group work. They were invited to create instant messaging groups using WhatsApp throughout the duration of the course. Questions were modified to match the use of instant messaging for collaboration and six (6) students were invited to answer a paper-based survey. A group discussion was conducted to get the feedback of the students. Questions that were difficult to understand were modified and incorporated in an online survey that was deployed to eighteen (18) students to test the validity and reliability of the instrument. A Partial Least Squares algorithm was applied, and the results are shown in Table 1.

Table 6

Instrument Validity and Reliability

	Chronbach's Alpha	Composite reliability	Average Extracted Variance
Social Presence (SP)	0.863	0.848	0.737
Social Influence (SI)	0.834	0.880	0.711
Attitude (ATT)	0.733	0.845	0.731
Usage Continuance (UC)	0.821	0.840	0.725

To establish validity and reliability, constructs in the structural model should have values that are higher than 0.70 for both Cronbach's Alpha and Composite Reliability. On the other hand, Average Variance Extracted must meet the minimum value of 0.50 (Hair et al., 2014; Limpin, 2018). The validated instrument was administered to students and a total of one hundred sixty-eight (168) responses were recorded after removing invalid responses. One hundred thirty-two (132) or 78.57% of the total responses are under the information technology program while thirty-six (36) or 21.43 % are enrolled in the computer engineering program. Of the total respondents, one hundred sixteen (116) are male students and fifty-two (52) are female. When asked about the use of instant message for group communication, ninety-seven (97) of the respondents or 58% primarily used this technology to communicate with classmates, thirty-two (32) or 19% with friends and thirty-nine (39) or 23% with family members.

4. Discussion of Results

The results of the survey were analyzed using Partial Least Squares – Structural Equation Model using smartPLS. This statistical tool provides a graphical user interface that is capable of supporting information systems research in multiple regression analysis (Hair et al., 2014; Wong, 2013). Furthermore, this statistical tool is able to reveal rich insights in empirical studies using a small sample size (Ringle, Sarstedt, & Straub, 2012). A bootstrapping technique was applied to the recorded responses using smartPLS. The results of the structural model validation are shown in Table 2. T-statistics values that are higher than 1.96 demonstrate that the path can be supported at a significant level.

Table 7

Results

	Statement	T-Statistics	Decision	Significant Level
H1	Social Presence (SP) has a positive influence on Attitude (ATT)	2.356	Accept	0.05
H2	Social Influence (SI) has a positive influence on Attitude (ATT)	2.157	Accept	0.05
H3	Social Influence (SI) has a positive influence in Social Presence (SP)	0.145	Reject	Not Significant
H4	Attitude (ATT) has a positive influence on the Usage Continuance (UC) intention to use instant messaging tools for collaboration	5.535	Accept	0.01
H5	Social Influence (SI) has a positive influence on the Usage Continuance (UC) intention to use instant messaging tools for collaboration	7.378	Accept	0.01

Social presence and social influence both positively influence the attitude of students to continually use instant messaging tools. The path of H1, social presence (SP) and attitude (ATT), has a value of 2.356 and we can infer that the connectedness of an individual with the rest of the group promotes positive attitude towards the usage continuance of instant messaging for collaboration. Recent years have seen notable improvements in interaction features that improve realness in digital interactions such as liking, sharing resources and video capabilities (Bere & Rambe, 2019). In a virtual group, social presence assumes a critical role in achieving shared learning objectives as individual members acquire group norms and interact with other members (Remesal & Colomina, 2013). Consistent with prior studies, social (SI) influence is a strong determinant of positive attitude (ATT) with a value of 2.157 supporting the path H2. People considered important by students have a significant influence on their attitude towards the continued use of instant messaging tools and confirms the findings of previous studies on the use of technology for collaboration (Huang, 2016).

Consistent with the theory of reasoned action and prior studies, attitude and social influence determines the behavioral intention to use instant messaging tools for collaboration confirming the validity of paths H4 and H5 (Hassandoust, Logeswaran, & Farzaneh Kazerouni, 2011; Olschewski et al.,

2013). The benefits acquired by students through IM groups encourage them to use these technologies beyond what is required in the course. Findings from other studies have intimated that participants expressed willingness to continually use these groups beyond the duration of their course (Tang & Hew, 2018). In the academic settings there is strong evidence that social influence is a strong predictor of behavioral intention. This influence comes from classmates or faculty members, aside from close friends and family members, who can exert influence to use available technology tools (Ramírez-Correa, 2017). Notable increase in the use of IM tools have been observed, and a big chunk of these users come from the age group of the participants.

Contrary to prior research of Huang (2016), social influence does not predict social presence and therefore, this study rejects the path H3. A possible explanation is that groupings were randomly selected. Findings suggest that students detect more interaction with familiar people and having a zero-history might influence the salience of other individuals in a computer-mediated interaction (Kreijns, Kirschner, & Jochems, 2003). The composition of the groups may also be an important factor in limiting group cohesion. The randomness of groupings might have affected the group cohesion which was found in prior research (Tang & Hew, 2018) to promote social presence in computer-supported collaborative environment.

5. Conclusion and Future Direction

In conclusion, this study reveals that social factors influence the students' attitude in the use of instant messaging as a collaborative tool. Confirming the theory of reasoned action, attitude has a direct influence on the students' intention in continuing their usage of apps such as WhatsApp to collaborate with their co-learners. Although there is a possible relationship between social influence and social presence, this cannot be supported based on the values revealed by the structural model. In this context, social influence and attitude are factors that exhibited strong influence on continued use. Academic institutions can promote collaboration tools by encouraging the teachers to embed these technologies in the course delivery as they have direct relationship with the students, and therefore can exert positive influence on the students' attitude in the use of technology (Ramírez-Correa, 2017). The importance of social factors is highlighted by this research. Therefore, developers for collaboration tools should consider incorporating features that would mimic real human interactions as previous studies have revealed that social factors are more important than technological factors in the usage continuance of collaboration technologies (Huang, 2016).

Although this paper contributes to the limited research on the usage continuance of instant messaging for collaboration, future research should exercise caution in interpreting the findings of this study for several reasons. First, the small sample size may limit the generalizability of the results of this research. Second, the duration of the study was limited to one semester, which means future research can use a longitudinal approach to improve the results of this study (Shen, Cheung, Lee, & Chen, 2011). Finally, a qualitative approach such as conducting in-depth interviews or by analyzing conversation logs is suggested in order to reveal deeper insights into the motivation of students in using instant messaging as a collaborative tool in a learning environment.

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