Yu, F. Y. et al. (Eds.) (2017). Proceedings of the 25th International Conference on Computers in Education. New Zealand: Asia-Pacific Society for Computers in Education

Student Engagement of Using Mobile Instant Messaging in Education: A Two-Stage Study

Ying TANG
Faculty of Education, The University of Hong Kong, Hong Kong
yingtang@connect.hku.hk

Abstract: Mobile instant messaging (MIM) has become a dominant means of communication for social life, but its educational value is not very well understood. Typical MIM applications are functionalized on smartphones, allowing users to send multi-modal messages with no extra service change. Facilitated by the mechanism of push notification, communication via MIM takes place in a "quasi-synchronous" form—messages are composed before being sent and responses can be postponed. Hitherto, no studies have examined the impact of using MIM on student engagement using objective measures, in addition to self-reported data. Therefore, this study will examine students' perception of using MIM in class and its impact on student engagement. Specifically, engagement will be examined via three components: behaviorally, emotionally and cognitively. A two-stage study will be conducted. Study 1 is a case study to explore student attitude and experience of using MIM in education. Study 2 will adopt a mixed-method, quasi-experimental nonequivalent control group design to compare two groups. The experimental group will use MIM app (WeChat) to conduct class discussion and activities, and the control group will use Moodle discussion forum, a threaded asynchronous communication platform for the same purpose.

Keywords: mobile instant message, online discussion, engagement

1. Background of the Study

Mobile instant messaging (MIM) has permeated social life and become a dominant means of communication for many students in higher education. Typical MIM applications are functionalized on smartphones, allowing users to send and save text messages, pictures, videos, voice threads, emoticons and documents through internet with no extra service change. Facilitated by the mechanism of push notification, communication via MIM takes place in a "quasi-synchronous" form—messages are composed before being sent and responses can be postponed for the information exchange. It is not synchronous transmission happening immediately as in oral conversation. The behavior of mobile instant messaging has become a new form of "technology addiction" that is worth attention and consideration.

Despite its popularity in daily activities, the educational value of quasi-synchronous communication via MIM is not well understood. Currently the main means of communication to supplement face-to-face teaching is through by threaded asynchronous communication platforms, such as discussion forums. Extant literature proves possible merits of using MIM to assist student communication and learning, yet previous studies reported conflicting results regarding the impact of using MIM on collaboration and learning, and no studies have been specifically conducted to examine the impact of using MIM on student engagement, using objective measures in addition than self-reported data.

2. Literature Review

2.1 Engagement

Engagement has long been considered a significant indicator of positive student learning and development since the 1930s. As a multi-dimensional construct, engagement is directly linked to desired

school behaviors and learning outcomes, such as academic and moral development (Coates, 2007). Fredricks, Blumenfeld, and Paris (2004) proposed a three-component framework to define the dimensions of engagement: behavioral engagement, emotional engagement and cognitive engagement.

- Behavioral engagement: observable behavioral indicators, such as participation in activities.
- Emotional engagement: affective responses in interaction with teachers, peers, and learning environment. Students with higher level of emotional engagement will have stronger sense of belongings that encourages them to persist school endeavors. It is normally measured by students' self-report data.
- Cognitive engagement: thinking and understanding of the subject or topic, reflected by personal investment on tasks, in terms of being strategic or self-regulating. It is assessed in various ways, either subjectively with self-report questionnaire, or objectively by looking at students' test score, course marks, and choices of tasks with different difficulty level.

2.2 Mobile Instant Messaging in Education

Meaningful learning happens when students are actively engaged in sharing, discussion and collaborative efforts to solve conflicts through negotiation (Dillenbourg, 1999). In a typical asynchronous online discussion, messages are threaded. That is, a series of messages will be posted as replies in a chain, visually as a line or tree shape, which enables readers to follow the conversation with ease. Despite its merits such as temporal flexibility and opportunity for reflection, asynchronous online discussion sometimes leads to lengthier communicative time, thus it is unsuitable for activities that require speed, such as a quick group decision making.

The development of MIM may possibly bridge the affordances of both asynchronous and synchronous discussion, and provide users with more choices depending on different task types and personal preferences. Studies on the educational use of MIM have seen tremendous growth over the recent years. Empirical evidence shows that using MIM can help promote students' learning, especially when it is used to facilitate classroom interaction, and enable authentic language exposure and exchange in foreign language teaching and learning.

Pedagogically, teachers have used MIM group as an online tutor platform (Butgereit's, 2007) virtual meeting room where participants can share multi-modal resources (Zhang & Xue, 2015), and to support foreign language education, especially for the realization of authentic communication (Fattah, 2015). MIM was also used in flipped classroom to disseminate materials before class (Chai & Fan, 2015). Social-emotionally, using MIM helps students stay involved in the up-to-the-minute knowledge about other participants and impromptu encounters. It not only serves as a personalized learning platform but also opens up a wider community for students to share and collaborate, even talk about private topics (Kim, Lee & Kim, 2014). Using MIM can also foster closer student-teacher relationship (Andujar, 2016).

2.3 Research Gaps and Contribution

The following research gaps have been identified after reviewing the extant literature. First, substantial amount of research effort has been spent on discovering the educational potentials of other popular social network sites, such as Facebook and Twitter. MIM remains one of the least exploited areas in higher educational institutions (Rambe & Bere, 2013). Second, hardly any previous studies examined the uniqueness of quasi-synchronous communication in education, by comparing it to other dominant means of communication such as asynchronous threaded text communication. Third, scholars have advocated for the potential of smartphones to promote student engagement, but no study has specifically examined the three components of engagement related to the use of MIM in class. Fourth, most studies conducted on technology and engagement tended to rely solely on students' self-reported data, such as questionnaire, which suffers from possible self-report bias.

Considering the prevalence of MIM use in students' social life, the growing interest in research and practice on using it in education, and the lack of empirical studies to examine the relationship between the use of MIM and student engagement in higher education, this study aims to improve our understanding of how student engagement is affected by using MIM tools. This study will also contribute to a deeper understanding of how students participate and perceive the use of MIM for

educational purposes, and allow educators to weigh its possible value against other communicative modes, such as threaded textual communication represented by discussion forums.

3. Research Questions

The primary purpose of this study is to find out student perception of using MIM for education, and the impact of MIM on student engagement. Fredricks et al. (2014) evaluated school engagement from behavioral engagement, emotional engagement, and cognitive engagement. Therefore, the following questions will be addressed.

RQ1: How do students perceive using MIM in educational contexts?

RQ2: How does using quasi-synchronous MIM interaction impact students' behavioral engagement?

RQ3: To what extent does using quasi-synchronous MIM interaction impact students' emotional engagement?

RQ4: How does using quasi-synchronous MIM interaction impact students' cognitive engagement?

4. Methodology

To find answers to the research questions accordingly, a two-stage study will be conducted. The first part of the study aims for an understanding of how students perceive using MIM in education, while the second part focuses on an in-depth exploration of its educational value related to student engagement. Specifically, given that relevant research is still in its infancy, the first stage of the study will be a case study to obtain rich naturalistic data for RQ1. The second stage will include a mixed-method, quasi-experimental nonequivalent control group design, to investigate whether and how using MIM, as a quasi-synchronous interactive mode, will impact student engagement (RQ2, 3 and 4) compared to asynchronous threaded interaction. Details are provided as follows.

4.1 Stage 1: The Case Study

The case is selected at a large university in Hong Kong in a master level course in education. The course was offered once a week, 3 hours each time, for 8 weeks in fall, 2015. The MIM-app, WeChat was used as a supplementary tool for instructional communication. The instructor set up a closed class group and invited all students. 28 students were enrolled and all of them agreed to participate.

Data will be collected from two sources: the retrieval of class chatlogs and semi-structured interviews with students. I aim to find what conversations have happened in the group MIM group by examining the chatlogs. By interviewing participants, I hope to have an understanding of how students evaluate the experience of MIM in the education, what advantages and disadvantages of using WeChat are, and to what extent they are willing and satisfying with using MIM for teaching and learning. Data analysis will be conducted with content analysis method. Constant comparative coding will be used to analyze the chat records and interview transcripts. 20% of the data will be randomly selected and analyzed by another researcher for reliability check.

4.2 Stage 2: The Quasi-Experimental Study

This stage will be conducted in a one-year master program in education from a university of Hong Kong. It involves two classes taking different modules of the same course taught by the same instructor, as the experimental group and control group respectively. Participants are naturally grouped to the experimental group and the control group as two class cohorts. The experimental group uses one of the leading MIM apps, WeChat to support class activities, while the control group adopts discussion forum of Moodle, the currently used learning management system on campus. To control the influence of students' prior knowledge level on engagement, as students with higher academic level will tend to be more active in activity participation (Tinto, 1987), a pre-test on content knowledge will be administered prior to the formal instruction during the first session of the class.

For research questions examining behavioral and cognitive engagement (RQ1 & 3), observation technique will be employed. Students' interaction record, including posts on WeChat and Moodle forum will be exported and analyzed, to subjectively examine the actual engagement reflected in participation behaviors and content. For RQ2 about emotional engagement, self-report measure will be used to examine students' emotions related to school-work and people around. The survey instrument is a 5-point Likert-type scale with 15 items established by previous literature, with a Cronbach's α reliability coefficient of higher than .7.

To find out student behavioral engagement of two groups, observable participation will be evaluated using content analysis technique. Specifically, the following dimensions will be categorized and compared: 1) group overall number of posts, 2) students' individual number of posts, 3) whether students accomplished the assigned tasks, 4) types of posts—whether it is related to academic, administrative, technical or social matters. Student emotional engagement will be analyzed using independent t-test, to see whether the two groups will display a significant difference in student affect. The analyses will be conducted using a .05 level of significance. Student cognitive engagement will be analyzed with content analysis. Student responses on WeChat and forum will be read and categorized according to the Analytical Framework for Cognitive Engagement in Discussion (after Zhu, 2006)

5. Preliminary Results: Pilot Study

A pilot study was conducted with two groups (n=5 and 6) of first-year master students undertaking a disciplinary course at a university in Hong Kong. Students voluntarily set up private WeChat small groups to discuss their collaborative projects. Interaction records were collected and analyzed, with the purpose of examining how students conducted their discussions in MIM groups, and how knowledge was constructed. The results show that students were able to conduct academic-related topics in the MIM-facilitated groups. MIM was probably most helpful for task-planning activity which required immediate decision making, with the support of pop-up notification. More higher-order knowledge construction was conducted for demanding tasks, such as "to evaluate" or "to create".

References

Andujar, A. (2016). *Benefits of mobile instant messaging to develop ESL writing. System, 62*, 63-76.

Butgereit, L. (2007, April). Math on MXit: using MXit as a medium for mathematics education. In *Meraka INNOVATE Conference for Educators* (pp. 18-20).

Chai, J. X., & Fan, K. K. (2016). Mobile inverted constructivism: Education of interaction technology in social media. *EURASIA Journal of Mathematics, Science & Technology Education, 12*(7).

Coates, H. (2007). A model of online and general campus-based student engagement. *Assessment & Evaluation in Higher Education*, *32*(2), 121–141.

Dillenbourg, P. (1999). What do you mean by collaborative learning. *Collaborative-Learning: Cognitive and Computational Approaches*, *1*, 1–15.

Fattah, S. F. E. S. A. (2015). The effectiveness of using WhatsApp messenger as one of the mobile learning techniques to develop students' writing skills. *Journal of Education and Practice*, *6*(32), 115–127.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, *74*(1), 59–109.

Kim, H., Lee, M. Y., & Kim, M. (2014). Effects of Mobile Instant Messaging on Collaborative Learning Processes and Outcomes: The Case of South Korea. *Educational Technology & Society*, *17*(2), 31–42.

Rambe, P., & Bere, A. (2013). Using mobile instant messaging to leverage learner participation and transform pedagogy at a South African University of Technology: Using instant messaging to leverage participation. *British Journal of Educational Technology*, *44*(4), 544–561.

Tinto, V. (1987). Leaving college: Rethinking the causes and cures of college attrition. *Chicago, IL: University of Chicago Press. UNESCO Education for All (2001).*

Zhang, Z., & Xue, Y. (2015). An investigation of how Chinese university students use social software for learning purposes. Procedia-Social and Behavioral Sciences, 186, 70-78.

Zhu, E. (2006). Interaction and cognitive engagement: An analysis of four asynchronous online discussions. *Instructional Science*, *34*(6), 451–480.