

# Examining Student Participation and Perception of Mobile Instant Messaging: An Exploratory Study

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**Abstract**—This paper aims to explore the pedagogical value of mobile instant messaging in higher education and probe its impact on teacher-student relationship. We studied a case of using WeChat, one of the most popular MIM applications, in a Hong Kong postgraduate class. We analyzed the chat log and interviewed the instructor and students. The results show that students welcomed the implementation of MIM app in classroom, and agreed that it provided access to mobile learning and possibilities to know the instructor. To further improve the educational value, students preferred: (a) setting clearer goals, (b) creating an open and interactive channel and (c) separating social and academic interactions.

**Index Terms**—mobile instant messaging, WeChat, learning, participation, higher education

## I. INTRODUCTION

Although Mobile Instant Messaging (MIM) is a comparatively new category of social media tools, it has become an inseparable part of people's lives, especially of the younger generations'. Statistical figures show the activity of sending and receiving messages takes 81% of the numerous activities users are accomplishing with their cellphones [1]. In addition, along with the surging of smartphone ownership, the percentage of users' mobile time spent on applications (apps) increased from 82% in 2012 to 90% in 2016 [2]. Our world in this regard has become smartphone-obsessed and application-obsessed.

MIM apps, such as WhatsApp, Facebook Messenger and Line, allow users to send and receive real-time messages from their mobile phones without paying for wireless services. Besides basic text-based communication, MIM apps provide consumers with other interesting and user-friendly functions, such as sorting friends with different tags, publishing personal presence and status, inserting emoticons, location information and audio/video slips in chats, and setting up closed group chats. WeChat is one such app developed and launched in China in January, 2011. In five years since its birth, WeChat has attracted 650 million active users, and is now the top one social messaging app in the China market [3], and the second internationally behind WhatsApp [4]. 86.2%<sup>1</sup> WeChat users in China were between 19 and 35

years old as of 2015 [5].

In recent decades, researchers have investigated a wide range of tools on various education-related topics, including the use of Facebook in undergraduate students [6], scholars' networked practices on Twitter [7], and the use of blogs in higher education [8]. However, MIM remains one of the least studied areas in educational settings, despite its popularity in daily use. Therefore, this paper aims to explore the pedagogical value of MIM in higher education and probe the impact of integrating MIM on teacher-student relationship. The role of MIM apps is of considerable importance to be tested in educational contexts, as educators are actively re-conceptualizing learning in the mobile age, and understanding the adoption of new media that could impact teaching and learning.

## II. LITERATURE REVIEW

Market investigation shows that smartphone ownership is especially high among youngsters with relatively high income and educational levels [9]. Nowadays, when people talk about going online, it is probable that they refer to accessing internet from phones wirelessly rather than with fixed broadband services. Therefore, the concept of learning needs to be changed anew. Learners are on the move, and learning activities are no longer constrained physically or temporally. Just as traditional learners move between rooms for different classes, now students are learning across much broader contexts and time spans, in various non-traditional learning spaces supported by wireless services. Learning happens anywhere-anytime-over breakfast table, on the bus to company, or before going to bed. Sharples and colleagues [10] highlighted such mobility and the role of interaction in mobile learning: "It is the learner that is mobile, rather than the technology...Learning is interwoven with other activities as part of everyday life...Context is constructed by learners through interaction." (pp.4-5). In other words, learning becomes a labile process that encompasses the joint efforts of learners and instructors with technological mediation. Mobile learning can be effective only if participants understand the strengths and weaknesses of technology, and deliberately incorporate technology into pedagogical practices [11].

MIM service is typically characterized as easy, mobile

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and immediate in the realm of mobile learning. The connectivity among participants is preserved and enhanced through real-time interactions. Researchers have begun to develop the theories and practices of MIM in education, and identified the following four main purposes [12]. They are: (a) to communicate with students, (b) to facilitate students' peer-sharing, (c) to build a common learning platform, and (d) to nurture a relaxed and pleasant social atmosphere. In practice, scholars used MIM to facilitate not only one-on-one informal learning, but also group discussions. For example, several researchers [13] studied university students' use of MIM to tutor K-12 learners after school, and found that informal coaching was facilitated when learners were able to contact teachers anonymously. Practicing private dialogues freed students from the pressure of being exposed and evaluated, strengthened the bond between instructor and students, and increased students' motivational level [14]. Additionally, MIM for group chat could promote activity and interactivity among learners [15]. By setting up a closed group, the initiator is able to create the boundary of community and strengthen the sense of familiarity among group members, with comparatively high privacy level. Previous studies indicate that the use of MIM has the following possible affordances: (a) developing a sense of belonging to a community [16]; (b) increasing flexibility of getting access to instructors and peers beyond physical and temporal limitations [17]; (c) advancing social and affective interactions among participants [18]; (d) facilitating teamwork process and outcomes [19]. No studies have been identified so far in regards to the educational practices of MIM and its impact on instructor-student relationship in a Hong Kong context.

### III. RESEARCH QUESTIONS

To examine to what extent the instructor and students used MIM application to communicate with students and facilitate teaching and learning, as well as the impact of incorporating MIM-app on students' perceptions on teacher-student relationship, the specific research questions are:

R1: What kinds of interactions and topics occurred in using MIM-app for class?

R2: How did the use of the MIM-app impact students' perception of learning and of the teacher-student relationship?

### IV. METHODOLOGY

To answer research questions, this study will focus on obtaining naturalistic data, analyzing pedagogical practices and participants' responses, without drawing any statistical conclusions. Therefore, the case study approach is adopted to obtain rich data of a particular situation [20]. We conducted the investigation in a master level class at a university in Hong Kong. This study collected two primary sources of data: the messaging history of the class chat group and interviews with the instructor and students.

#### A. Participants and Contexts

The case study was conducted at a university in Hong

Kong, in a master level disciplinary course in education. The course was offered once a week for eight weeks from September to December, 2015. 28 students were enrolled, 26 of whom are English language learners from mainland China or Hong Kong local communities. The instructor is a native English speaker. The MIM-app WeChat was used throughout the semester, mainly as a supplementary communicative tool during and after instructional hours. For example, if the instructor meant to convey information to students after class, such as assignment reminders or additional content resources, he would send the information on WeChat. It did not replace traditional face-to-face teaching in classroom. The instructor set up a closed WeChat group at the beginning of the class, and invited all students to join. All participants were able to send and receive messages anytime. No prescribed rules were applied in the implementation of the group chat, nor were any technical training sessions provided.

#### B. Data Collection

Data were collected primarily from two methods: the retrieval of group chat logs and interviews. The purpose of examining the chat history is to understand in what ways participants were communicating via MIM, and what kinds of topics occurred. 868 messages were collected with the consent of all participants involved. Interviews were conducted with the instructor and 13 students voluntarily, with the intention to have an in-depth understanding of how participants evaluated their experience and how the use of MIM impacted their perception towards learning and teacher-student relationship.

Semi-structured interview format was employed. In this way interviews remain focused on answering key research questions, while at the same time enable a certain flexibility to explore issues that arose spontaneously in the interaction [21]. The main foci of interview questions included: participants' familiarity of WeChat as a social media tool; how instructor introduced the tool to the class; how students understood the expectation of using WeChat for this class; to what extent did student participate in the group chat; how students evaluate the use of WeChat in this course; what advantages and disadvantages of WeChat use are reported by participants; and students' willingness and suggestions of using WeChat in educational setting in the future. Interviews were audio recorded with consent, and transcribed verbatim.

#### C. Data Analysis

Guided by the research questions, we used inductive content analysis method [22] to identify and categorize thematic topics occurred in the group chat and the interview records. Constant-comparative coding method [23] was conducted to analyze teacher and students' participation in the MIM chat. No predetermined coding scheme were applied. Rather, all categories were flowing from the data. We went through the data corpus back and forth until no new categories could be identified and generated. 20% of the data were randomly selected and analyzed by the second author to confirm the reliability of

the data analysis. This resulted in an agreement rate of 95%.

## V. RESULTS

### A. Quantitative Analysis of WeChat Participation

As the chat log automatically saved dates and time of each posts, we were able to analyze teacher and students' participation from the following dimensions: (1) time of using WeChat, (2) modes of information transmitted, such as text, picture, video, etc., (3) initiators and targets of interaction, and (4) topics identified in the interaction. By doing this, we aimed to gain a comprehensive understanding of contextual and situational conditions of using MIM-app in this case.

#### 1) Time—when did the teacher and students use WeChat?

No specific requirements were declared on the use of WeChat for this course; participants could use it anywhere anytime. We referred to the course schedule from the faculty website, and distinguished if participants used WeChat during or beyond instructional time. The result shows that among all 868 messages, only 120 (13.8%) were posted during instruction, while other 748 (86.2%) were posted beyond class time. Such proportion corroborates the fact that the use of mobile devices could help extend communication among course participants. Also, teachers and students were comfortable with this spreading-out space and time of interaction, as they took advantage of it voluntarily.

#### 2) Type—what modes of information were involved in the WeChat message?

WeChat allows sharing multiple modes of information besides traditional texts, such as emoticons, audio/video files, pictures, locations and hyperlinks. Therefore, we wanted to see whether participants actively integrated multi-modal materials in their communication. Fig. 1 shows the frequency of each message mode occurred in the interaction. The results show that teacher and students skillfully incorporated all possible modes of messages in group chat. As text remains dominant to convey meaningful information exchange (65.8%), among which 16% posts included emoticons. Further, emoticon-only messages run up to the second most frequently used type, taking 31% of all posts. This is interesting to use—we will further discuss this phenomenon in the discussion section.

#### 3) Aim—who are the participants in the group chat?

In order to understand who were participating in the group chat, we identified the initiators and targets in each dialogic thread. The following five categories summarized the direction and participants in all conversational posts:

**Teacher to all (TA):** If the message was sent by the teacher and intended to get reply from all students;

E.g. "Please do not read your literature yet for the next session."

**Teacher to student (TS):** If the message was a direct reply/comment to a student's previous message, or if the teacher specifically addressed a student in the message;

E.g. "That's one possibility, but I think it's a bit too public: everyone can read, and perhaps constructively

plagiarize or plagiarize your work."—response to a student's suggestion.

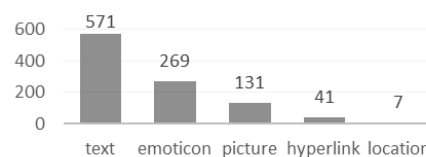


Figure 1. Modes of messages.

**Student to teacher (ST):** If the message was a direct reply/comment to the teacher's previous message, or if the student specifically addressed the teacher in the message;

E.g. "...Bravo! Looking forward for your sharing!"—response to the instructor's previous post about sharing some content-related information.

**Student to all (SA):** If the message was sent by one student and intended to get reply from all students;

E.g. "Hello! Everyone! What will you do on this study week? I am planning to organize a hiking on this Thursday and see anyone would like to join."

**Student to student (SS):** If the message was a direct reply/comment to another student's message, or if the student specifically addressed another one in the message.

E.g. "I think we need to consider per people GDP. Not the total. Total GDP make no sense to the ICT idea in this class"—response to a student's previous message.

Fig. 2 displays the proportion of all categories of interaction in terms of initiators and targets. The results show that first, though visible to all, there existed one-on-one communication. The ratio between to-all messages and to-one messages was nearly equal and slightly more from the teacher's part. Second, nearly 70% of entire messages were posted by students. Noticeably, more one-on-one communication were conducted by students (39% vs. 9%), either towards the teacher or peers, and more one-on-one interaction between teacher and students were initiated by students (26% vs. 9%). Based on these comparison results, we believe that the incorporation of WeChat did open up communicative channels between teacher and students and among students themselves. Unlike the uni-directional lecturing pattern in traditional classroom, students were able and willing to make their voice heard on the platform of MIM-app.

With a more in-depth analysis of the thematic changes in interactions, we identified 128 meaningful rounds of interaction. Here we interpret a round of interaction as one person initiates a topic, and others builds on the topic by providing responses such as compliment, agreement or objection, with no deviation away from the original topic. The result show 79 interactions were initiated by the instructor, as opposed to 49 from the students' part. Take into account the aforementioned fact that students' posts represent 70% of the entire body, we can see that even though students' voice is more evident and their roles are emerging, the instructor still performs an irreplaceable role to guide class communication.

#### 4) Topics—what topics of messages occurred in the MIM-app interaction?

We further analyzed the topics of the 128 interactions to

understand the purposes of using MIM-app in a traditional class. We firstly dichotomized interactions into academic (56/128) and non-academic (72/128), and then conducted in-depth analysis under each category respectively.

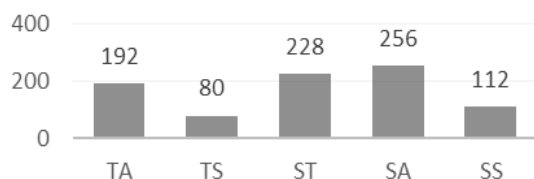


Figure 2. Initiators and targets of interactions.

### Non-academic topics (72/128)

- *Phatics and salutations.* Participants posted messages for pure social purposes rather than information sharing, such as greetings, holiday celebration, or expression of gratitude.

E.g. "Safe travels as many of you return to your families this weekend. Bless you and your families!"

- *Non-academic class notification.* The instructor notified students with non-academic information, such as reminding students to bring mugs for coffee, or if someone left stuff in classroom.

E.g. "For whoever left this in the classroom, I put it on my desk in my office."

- *Gathering planning.* Participants used the MIM platform to organize social gatherings out of instructional time.

E.g. "Hello! Everyone! What will you do on this study week? I am planning to organize a hiking on this Thursday and see anyone would like to join."

- *Real-time information inquiry and update.* During gatherings, participants updated personal status, required information such as locations, and shared pictures taken with individual phones.

E.g. "enjoy tonight, guys! I won't be able to make drinks regrettably which means you should have an extra one for me"

- *Information sharing.* Participants shared non-academic information in the group, such as good food or drink, job opportunities or other social events on/off campus.

E.g. "Hi guys, would any of you like to work for XX? He is hiring for someone to work under him. He is looking for someone to start after Chinese New Year."

### Academic topics (56/128)

- *Pre-class preparation.* The instructor posted in advance to better prepare students for the coming class, such as reminding students to bring their laptops, updating students with new materials, precluding the class with guest speaker information, etc. Students also shared materials of their group presentations prior to the class.

E.g. (Instructor) "Hey guys, we will use a Google hangout to connect with [guest speaker]. Can anyone click on this link to see if it works? Thank you!"

- *In-class real-time comment.* The instructor commented on or provided additional information real-time during class, especially when guest

speakers or students were giving presentations. Students asked questions.

E.g. (Student, during another group's presentation) "[group name]: Do you think 21century skill is necessary for K12 students in mainland China?"

- *Assignment reminder.* The instructor reminded students of coming due assignments.

E.g. "Please read the three articles for session 3 before coming to class next Wednesday."

- *Feedback and reflection.* The instructor reflected upon previous sessions. In addition, as in his personal blog, he provided feedback on students' performance in class and addressed questions, he also reminded students of his blog updates.

E.g. "Hi guys, nice job today; I am also a bit embarrassed because I have not organized the readings for the subsequent sessions properly...I will reorganize the readings and the reading list and get back to you shortly."

- *Information sharing.* Students and instructor shared information they found interesting, such as course-related news, useful academic resources, and schedule of professional seminars. The information was multi-modal, as there were texts videos, pictures and hyperlinks.

E.g. (Instructor) "You may find this book helpful in completing individual assignment 1 and 2 [Hyperlink to a book]."

Fig. 3 displays all topics and frequencies of interactions in the group chat. The results show that participants used this tool almost equally for academic and non-academic purposes. However, the emphasis of use is different under these two categories. For academic purposes, it was mainly used as a notification and reminder tool. Instructor and students sent class preparation information and after-class feedback to each other. For non-academic purposes, participants mainly took advantage of the immediateness of interaction, to realize real-time information exchange during class gatherings.

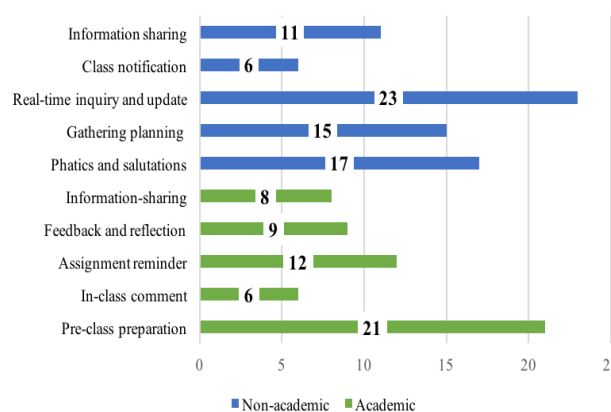


Figure 3. Topics of interaction.

### B. Qualitative Analysis of Participants' Perception

The interview data was analyzed to understand participants' perception of using MIM-app, in this case WeChat, in higher educational settings in Hong Kong. The key question we seek to answer was: How did the use of the WeChat impact students' perception of learning and of

the teacher-student relationship?

Most students found it novel and interesting, and welcomed this creative attempt. *"It is a fresh experience. This instructor is really interesting!" "I think he is nice and he wants to be more like a friend to us."* Some students felt ok with using it in class. *"The instructor wants to use it. Of course I would not say no."* No negative responses were received about introducing WeChat to this class.

#### 1) Perceived impact on learning

When being asked about the impact of using WeChat on learning, students' evaluation varied. Several topics emerged as we analyzed and summarized interview responses. Below we list the topics with detailed elaboration on each one.

#### **Sharing information and notification (immediateness vs. overload)**

Students applauded the immediateness of information dissemination, as all of them mentioned it in the interview. It was easy to notice the information, as the information would reach students individually at once. One student specifically appreciated the assignment-due and class-preparation reminders that the instructor sent to them.

*"When the notification popped up, I would intuitively click and check. So it reminded me 'oh, this assignment is due.' 'I need to read another article for next class.' It actually helped me to get prepared and get work done."*

Several students compared it with Moodle, a learning management system used on campus and expressed their preference over WeChat in terms of the timeliness of the information.

*"Nobody would check Moodle constantly. It is really convenient to use WeChat if the instructor wants to send information, and it is natural for us to read it immediately."*

However, some students expressed the concern over the information "overload". The linear display of messages makes it hard to locate and identify information from any particular individual. Students were compelled to check the group chat constantly so that they would not miss any important messages.

*"I think sometimes it is too immediate. Information just flushes in. It is not organized according to topics like discussion board." "The information is like running water. It is hard for me to find some quality feedback."*

#### **Sharing files (convenience vs. disorganization)**

In terms of file sharing, students also had different opinions. Some of them found using WeChat has accommodated to their habit, therefore if the instructor shared a file in the group, there might be a large chance that they would read and respond. Some of them did not like the linear display of interaction in WeChat, thus so it was not helpful to organize learning materials

*"If he wanted to share something, it would be really easy for him to share it in the group. It's also easy for us to save to our phones. He did not do it, though. I think he is still exploring. I would really appreciate it if he could share some e-learning materials in this way. If he uploaded them to Moodle or sent by emails, we would*

*probably not read."*

On the other hand, some students complained about the disorganization of file sharing using WeChat. Immediate as it is, it does not provide the choices to organize files according to topics, as students expect in a forum or learning management system.

*"It is a flow of information. I like it being in the daily communication, but it is not helpful to organize learning materials."*

#### **Asking for help (non-specific)**

When being asked if students would ask questions in the group, most students denied. Some of them still preferred talking to the instructor face-to-face, or sending emails individually, which would be more "efficient" according to their comments. Some of them would use WeChat to ask for help, but they would go directly to targeted helpers by sending private messages, rather than to the group. In general, most students could but chose not to ask for help in the group.

*"I think it might bother my classmates (if I post the question in the group), if it is not relevant to them. And if it is not a relevant question, nobody will answer it."*

#### **In-class comment (helpful vs. stressful)**

One way the instructor used WeChat was to provide real-time comment in class. Students' evaluation on this topic was not the same. Most students in this class came from mainland China, whose first language is not English. Therefore, it was challenging for them to process the information provided in class, and reflect upon it and immediately externalize their thoughts in communication. For some of them, the in-class comment was stressful.

*"Sometimes the instructor thought a particular part of group presentation was very interesting, so he would remind us to pay attention. But we are not native speaker. We cannot react as quickly as he does."*

On the other hand, some students were positive about the instructor's in-class comments. To them, the instructor's in-class comments were supportive to understand content, especially when the guest speaker was giving presentation.

*"He (the instructor) would invite guest speaker to talk to us. He would send us the notes or comments during the talk. As a student, I think it is really considerate. Sometimes it was hard for us to follow or understand the guest speaker. In this way, the instructor would not disrupt their talking, but he helped us understand what he thought was important."*

#### **Mixture of academic and social discussion (beneficial vs. stressful)**

The information communicated in the group chat was on a mixture of social and academic topics. Students expressed different opinions regarding the blurry line of academic and non-academic discussion in the group. Some students wanted to keep social media tools to its "pure social" functions for a stress-free communicative fashion with friends. Once it was adopted for academic purposes, it would create pressure and anxiety that they felt the compulsion to do the "right" thing, such as to respond actively to instructor's posts.

*"I would like to know more about my teachers, and I*

*hope all other teachers began to use social media to talk with us. But I don't want it to be used in class. Otherwise we will lose the fun."*

Some students expressed the confusion that this mixture brought to their learning. They did not refuse to use it in class, but they wanted the functions to be clearly stated at the beginning, so that they could better utilize it to help them with learning.

*"I hope to be told precisely what this group was for. Sometimes there would be important course notification, but sometimes people just chitchat there. I want to know what's really going on and what I can do in the group. Maybe two groups would be better? One for academics, one for chatting?"*

However, some were optimistic about blending learning and social interactions. They thought it created an opportunity in which students can approach learning in a casual way.

*"I think mixing them up is better. I don't like the feeling that the instructor is at the top high. I like that I can choose between social talk and academic talk."*

## 2) Perceived impact on teacher-student relationship

Overall, all students agreed using WeChat increased the interactive frequency with the instructor, and they appreciated the efforts that the instructor made to become closer to them. *"No other teachers in this school used WeChat, this kind of 'folksy' application. All others are beyond reach, as they only exist in class."*

When asked about their opinions about the impact of using WeChat on teacher-student relationship, students gave varied comments. Some students agreed that with more interactions, they had more opportunities to "humanize" the instructor, so they were willing to know more about him. However, to those who did not think it had actually impact on teacher-student relationship, they expressed two major concerns.

First, students sometimes felt obligated to reply, especially to the instructor. They were afraid if nobody responded, the instructor would "lose face". One student described, *"He is a teacher. Sometimes he talked a lot in the group but nobody seemed to pay attention. So I replied to him even though I didn't want to."* Second, some students felt the instructor was closer to some students than others. As face-to-face classroom is a "serious and equal" environment in which everybody receives almost the same level of attention, WeChat interaction tend to be comparatively "unfair": active students would have more interaction with the instructor. Thus, teacher-student relationship varies because of diverse students' personalities. *"This is a big group. Some were really active, and they would keep interacting with him (the teacher), and they would go to do things (events or gatherings) together. But some were quiet. WeChat would not have a big impact on this group of people."*

## VI. DISCUSSION

### A. The Prevalent Use of Emoticons

Emoticon-only messages are just after informational text, taking the second largest portion among all modes of

messages. Emoticon is under rapid development, in public discussion board or in private instant messages. Interactions are no longer only textual, but more visual and vivid. Actually the use of emoticons has supplemented the loss of nonverbal cues in computer-mediated communication [24] and become the major way to express emotions. WeChat has by default encoded several series of emoticons, but also allows users to create and publish their own emoticons. Therefore, it has enormously diversified the modes of information representation, and made online conversations more active and dynamic. As users decode textual cues, they will process the information in a way that forms interpersonal impressions [25]. Therefore, emoticon use will represent users' personalities and affect inter-personal relationship.

Previous study also showed that participants used more emoticons in socio-emotional than in task-oriented social contexts [26]. In our study, most emoticons were used as reception signals to previous posts for social emotional expression, rather than in actual tasks such as answering questions. For example, when the instructor made a course announcement, students would send an emoticon signaling "message received" or appreciation. However, students said that they would not ask questions in the group, because *"it would be embarrassing if nobody answered your question but sent several emoticons"*. More research is needed to understand the impact of using emoticons on interpersonal interactions and online requests.

### B. Increasing Interactivity

Based on the students' responses, the interactivity on WeChat is increased, compared to that in other classes with instructors not using this tool. However, the interactivity could be further increased if the instructor was more facilitative. In this case, the instructor intended to hear more from students, but he used it mainly as a notification board rather than a platform inviting feedback. *"It is inconsistent"*, according one of the interviewees. *"There would be better interactive experience if he had asked more questions. If you just had an announcement, what should I say? So we just say, ok thank you."*

Scholars have discussed strategies to increase interactivity in online discussion and proved that asking the right types of questions can assure students to be on the right track and encourage them to contribute to the discussion [27]. Two types of questions are particularly useful: questions about others' opinions, and questions of clarification. In addition, inviting feedback is another way to increase the participation and the sustaining of online interaction [27].

### C. Instructor's Readiness

Teachers' readiness has the most important influence on the integration of a certain technological tool [28]. In this case, the instructor is highly proficient in computer and technology in general, but not in this particular tool. Therefore, some students commented that the instructor could have used more expedient functions of WeChat, such as sharing files or real-time locations. In addition,

since the instructor did not plan to use WeChat prior to the first class, the positioning of WeChat in terms of instructional functions was not clear. Therefore, both the instructor and students did not know in what situations WeChat would be used, and thus its academic potentials had not been fully exploited.

#### D. Limitations and Future Research

There are several limitations to this study, thus requires future research. The transferability of our findings may be limited. We only studied one case of a post-graduate class, majoring in education. It is possible that postgraduate students are more proactive in taking initiative in their own learning, and thus more responsive compared to undergraduate students. Besides, students who are majoring in education might be more willing to try new educational approaches compared to their counterparts from other disciplinary areas. Therefore, future research might investigate the use of instant messaging tools in other educational contexts broadly, in order to get a more comprehensive understanding. In addition, the results in the current study might be biased, as all interviewees participated in the study voluntarily. Future research might have look further into the impact of using MIM-app on class interactions, including a closer examination of the quality of students' thinking, and valuable MIM-app supported learning activities.

#### VII. CONCLUSION

Students welcomed the use of MIM-app in classroom, yet they thought it had further potential to be exploited to better serve educational purposes. Their participation is comparatively high by using MIM-app as a communicative tool, but higher interactivity can be achieved with thoughtful and purposeful educational design. Therefore, we summarized several strategies of instruction with the expectation to enlighten successful implementation of MIM-app in higher education.

First of all, the instructor should be familiar with the tool to be used in class and be clear about the purpose of using it. He/she has to make pedagogical adjustment accordingly before introducing a new tool to the class. Second, students need to be clearly aware of the expectation of using MIM-app in the class, and thus they will be positive and comfortable about using it. In this case, the majority of interviewees prefer using it solely for academic or social purposes, and do not want to mix them up. Third, in-class comments are welcomed by students, especially when it serves as an additional scaffolding material to help students understand course content. Fourth, in order to have more students' participation and interactivity, instructors can ask more opinion-seeking or clarification questions, and stay open to feedback.

#### REFERENCES

- [1] Pew Research Center. (September 2013). Cell phone activities 2013. [Online]. Available: <http://www.pewinternet.org/2013/09/19/cell-phone-activities-2013/>
- [2] Smart Insights. (April 2016). Statistics on consumer mobile usage and adoption to inform your mobile marketing strategy mobile site design and app development [Online]. Available: <http://www.smartinsights.com/mobile-marketing/mobile-marketing-analytics/mobile-marketing-statistics/>
- [3] China Internet Watch. (April 2016). Top 6 China mobile social networking apps. [Online]. Available: <http://www.chinainternetwatch.com/17368/top-mobile-social-networking-apps/>
- [4] Palo Alto, Shanghai, Singapore & Reading. (December 2013). Cross-platform social messaging apps are making social networking increasingly competitive. [Online]. Available: <http://www.canalys.com/newsroom/cross-platform-social-messaging-apps-are-making-social-networking-increasingly-competitive>
- [5] Statista. (2016). Distribution of WeChat users in China as of January 2015, by age. [Online]. Available: <http://www.statista.com/statistics/387658/wechat-china-user-age/>
- [6] N. Selwyn, "Faceworking: Exploring students' education-related use of Facebook," *Learning, Media and Technology*, vol. 34, no. 2, pp. 157-174, 2009.
- [7] G. Veletsianos, "Higher education scholars' participation and practices on Twitter," *Journal of Computer Assisted Learning*, vol. 28, no. 4, pp. 336-349, 2012.
- [8] J. W. S. Sim and K. F. Hew, "The use of weblogs in higher education settings: A review of empirical research," *Educational Research Review*, vol. 5, no. 2, pp. 151-163, 2010.
- [9] Pew Research Center. (April 2015). U.S. smartphone use in 2015 [Online]. Available: <http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/>
- [10] M. Sharples, J. Taylor, and G. Vavoula, "Towards a theory of mobile learning," *Proceedings of mLearn*, pp. 1-9, 2005.
- [11] L. F. Motiwalla, "Mobile learning: A framework and evaluation," *Computers & Education*, vol. 49, no. 3, pp. 581-596, 2007.
- [12] D. Bouhnik, M. Deshen, and R. Gan, "WhatsApp goes to school: Mobile instant messaging between teachers and students," *Journal of Information Technology Education: Research*, vol. 13, pp. 217-231, 2014.
- [13] S. Hrastinski, A. Edman, F. Andersson, T. Kawnine, and C. A. Soames, "Informal math coaching by instant messaging: Two case studies of how university students coach K-12 students," *Interactive Learning Environments*, vol. 22, pp. 1-13, Jan. 2015
- [14] P. L. P. Rau, Q. Gao, and L. M. Wu, "Using mobile communication technology in high school education: Motivation, pressure, and learning performance," *Computers & Education*, vol. 50, no. 1, pp. 1-22, 2008.
- [15] L. Bollen, S. Eimler, and H. U. Hoppe, "SMS-based discussions-technology enhanced collaboration for a literature course," in *Proc. 2nd IEEE International Workshop on Wireless and Mobile Technologies in Education*, 2004, pp. 209-210.
- [16] A. Doering, C. Lewis, G. Veletsianos, and K. Nichols-Besel, "Preservice teachers' perceptions of instant messaging in two educational contexts," *Journal of Computing in Teacher Education*, vol. 25, no. 1, pp. 5-12, 2008.
- [17] C. Barhoumi, "The effectiveness of WhatsApp mobile learning activities guided by activity theory on students' knowledge management," *Contemporary Educational Technology*, vol. 6, no. 3, pp. 221-238, 2015.
- [18] M. Lee and T. E. Johnson, "Understanding the effects of team cognition associated with complex engineering tasks: Dynamics of shared mental models, Task-SMM, and Team-SMM," *Performance Improvement Quarterly*, vol. 21, no. 3, pp. 73-95, 2008.
- [19] H. Kim, M. Lee, and M. Kim, "Effects of mobile instant messaging on collaborative learning processes and outcomes: The case of South Korea," *Education Technology & Society*, vol. 17, no. 2, pp. 31-42, 2014
- [20] R. K. Yin, *Case Study Research: Design and Methods*, Beverly Hills, CA: Sage Publications, 2013.
- [21] B. L. Berg, *Qualitative Research Methods for the Social Sciences*, 7th ed., Boston MA: Allyn and Bacon, 2009.
- [22] H. F. Hsieh and S. E. Shannon, "Three approaches to qualitative content analysis," *Qualitative Health Research*, vol. 15, no. 9, pp. 1277-1288, 2005.
- [23] Y. S. Lincoln and E. G. Guba, *Naturalistic Inquiry*, Sage, 1985.
- [24] G. Riva, "The sociocognitive psychology of computer-mediated communication: The present and future of technology-based



interactions,” *Cyberpsychology & Behavior*, vol. 5, no. 6, pp. 581-598, 2002.

- [25] J. B. Walther, “Interpersonal effects in computer-mediated interaction a relational perspective,” *Communication Research*, vol. 19, no. 1, pp. 52-90, 1992
- [26] D. Derks, A. E. Bos, and J. von Grumbkow, “Emoticons and social interaction on the Internet: The importance of social context,” *Computers in Human Behavior*, vol. 23, no. 1, pp. 842-849, 2007
- [27] K. F. Hew and W. S. Cheung, *Student Participation in Online Discussions: Challenges, Solutions, and Future Research*, New York: Springer, 2012.
- [28] F. A. Inan and D. L. Lowther, “Factors affecting technology integration in K-12 classrooms: A path model,” *Educational Technology Research and Development*, vol. 28, no. 2, pp. 137-154, 2010.



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