

Chapter 10

Access Moodle Using Mobile Phones: Student Usage and Perceptions

Xiao Hu, Leon Chi Un Lei, Jinbao Li, Nathalie Iseli-Chan,
Felix L.C. Siu and Samuel Kai Wah Chu

Abstract This study investigated how often students used mobile phone to access various activities on Moodle. A survey on self-reported usage was filled by 252 university students in courses offered by four different faculties at the University of Hong Kong. Follow-up interviews were conducted to solicit students' perceptions on mobile access to Moodle and the underlying reasons. The results show significant differences in students' usage of various Moodle activities via mobile phones. Students' responses also suggest that mobile access to Moodle is a necessary complement to computer access but its limitation on usability and reliability may have restricted its potential in enhancing teaching and learning.

X. Hu (✉) · L.C.U. Lei · J. Li · N. Iseli-Chan ·
FelixL.C. Siu · S.K.W. Chu
The University of Hong Kong, Hong Kong, SAR China
e-mail: xiaoxhu@hku.hk

L.C.U. Lei
e-mail: culei@hku.hk

J. Li
e-mail: jinbao@hku.hk

N. Iseli-Chan
e-mail: iselich@hku.hk

FelixL.C. Siu
e-mail: flcsiu@hku.hk

S.K.W. Chu
e-mail: samchu@hku.hk

10.1 Introduction

The learning management system (LMS), Moodle, has been adopted by many higher education institutions around the world. To date, Moodle has been registered in more than 1800 sites over 120 countries, and is available in more than 60 languages (Kennedy 2004). Despite the increasing use of Moodle, concern has been expressed as to how Moodle is being used (Carvalho et al. 2011).

With the rapidly increasing use of handheld mobile devices among staff and students in higher education, it has become more and more common for them to access teaching and learning-related information and services using mobile devices (Peters 2009). A 2011 survey on mobile services in academic libraries in Hong Kong and Singapore reveals that the possession rate of mobile devices was 93.4 % among Hong Kong college students, and 61.9 % of them used smartphones to access the Internet (Ang et al. 2012). It is not uncommon to see university students use smartphones to access learning resources on Moodle and other LMSs. However, how frequent students use Moodle via mobile phones to carry out different Moodle activities and the possible reasons behind such usage patterns have rarely been formally investigated. The current research aims at filling this gap by examining students' frequencies of mobile access to Moodle for different activities and exploring possible reasons behind the usage patterns.

10.2 Related Work

10.2.1 *Use of LMS*

Research has been conducted to describe and analyse the use of LMS in higher education. Francis and Raftery (2005) defined three levels of LMS usage. The first level is for depositing materials and distributing information; the second is for enhancing teaching and learning by using various tools in LMS for communication, collaboration, assessment and quiz tests. The third and highest level is for supporting fully fledged online courses where most learning takes place on the LMS. It is indicated that even though an e-learning platform is available, the institutions might not make full use of it (Nichols 2008). Carvalho and her colleagues (2011) surveyed around 15,000 students for their use of two LMSs, Blackboard and Moodle. They found that for the majority of students, the use of the LMSs was still in the lowest level, that is for accessing learning materials and course announcements. Only some of them used LMSs for sending emails or taking quiz tests. The course forum, course chat room and virtual classroom were among the least used functionalities.

On the other hand, the importance of learning through social interaction and collaboration has been confirmed repeatedly (Tu and Corry 2003). Interaction plays

a crucial role in academic success and persistence (Shea et al. 2006), and it is believed that knowledge construction begins when a student has engaged in a collaborative activity, because knowledge is created in situation (Chavez 2011). Therefore, educators increasingly make efforts to bring the use of LMS to a higher level that involves more interaction and collaboration among students.

It has been shown that technology usage patterns could vary across users' experience and information technology competency. For example, a study on organizational IT implementation (Venkatesh and Bala 2008) derived positive relations between usage experience and technology usage. Research has also been conducted to investigate whether Computer Self-efficacy (CSE) is related to users' perceived usefulness of e-learning (Hayashi et al. 2004). Different genders may also affect technology usage patterns. Ong and Lai (2006) concluded that males and females perceived e-learning differently, which influenced their behavioural intention to use e-learning. Meanwhile, Horvata et al. (2013) claimed that males and females were equally satisfied with Moodle quality characteristics. In terms of students' perception on Moodle, Kennedy's (2005) study on Hong Kong students' attitudes towards Moodle found that students liked the convenient accessibility of learning resources and the flexibility of organizing online materials on the Moodle pages. Carvalho et al. (2011) also found that students mainly perceived helping to find necessary information as the most useful function of Moodle. As such, previous studies considering users' experience, IT competency and genders have focused on technology usage patterns and perception towards e-learning, leaving the context of mobile access to e-learning less researched.

10.2.2 Mobile Learning

Mobile learning is thought to enhance opportunities for building a learning community, interaction and collaboration among students (Donaldson 2011). Çavus et al. (2008) investigated students' opinions of mobile learning by surveying 317 undergraduate students. They found that students' learning greatly benefited from using emails, forums and chat via mobile devices, and mobile learning was deemed effective by students during their communication with other students and instructors. In their study, there was no statistically significant difference in mobile learning across departments, gender or nationality. In terms of mobile access to LMS, researchers are divided as to their opinions towards the integration of LMS into mobile learning. For instance, Çavus (2011) presented the benefits of mobile learning using LMS and advocated that the integration of LMS into mobile learning would be a trend of learning platform in the future learning environment. On the other hand, Kouninef et al. (2012) brought up some constraints of mobile learning in using mobile technologies, including the small screen size and other device

limitations. Besides, Ssekakubo et al. (2013) found that mobile phones were students' least used electronic devices for accessing LMS services and the main reason was the inadequate design of the LMSs for mobile interaction.

Although a number of studies investigated how frequent students used Moodle to accomplish various activities, there seemed a lack of a direct study relating the frequency of mobile access of Moodle to the background of users. In this study, we therefore attempt to identify students' Moodle usage patterns across different disciplines, their Moodle experience, and IT competency levels and between genders. Specifically, the research questions this study aims to answer are: (1) how would the frequencies of mobile access to Moodle activities vary across students in different disciplines, with different Moodle experience, IT competency levels, and between genders? (2) why do students use (or not) mobile access to Moodle.

10.3 Methodology

10.3.1 *The LMS and the Courses*

Moodle (version 2.6) was used in all the courses included in this study at the University of Hong Kong. Although there is a mobile app for Moodle, it cannot be integrated into the Moodle installation due to information security implementations in the University. Alternatively, the Moodle installation provides a Mobile Theme, which is a custom-designed display for smartphone browser screens. When users use smartphones to access Moodle, the Moodle server can detect the access device and then automatically display the Mobile Theme. Students can use the Mobile Theme to view course content pages, submit assignments and access a number of the Moodle functions including Forum, Choice, Feedback, Quiz, URL and Wiki.

Seven courses of four instructors were selected for this study. The instructors were in four different disciplines, Education, Engineering, Social Sciences and Humanities and Arts. The four instructors used Moodle in different levels and styles. The instructor from Social Sciences used Moodle as a repository of teaching materials and a platform for making course announcements. Besides uploading teaching materials, the instructor from Education also used discussion forums for student–student and student–instructor interaction. Links to external web sites were also put on Moodle of this course. As for the course in Engineering, the instructor used Moodle as a platform where students can read/download learning materials, submit assignments, take quizzes, conduct group projects and receive feedback from the instructor. The instructor from Humanities and Arts used Moodle to host learning materials, send announcements and messages to students, answer questions students raised, as well as Wiki and Glossary activities where students could post course-related information they collected off-class. The Engineering course was a Common Core course that could be taken by any year 1 and year 2 students across the University. As the class size was big, there were six teaching assistants in this

Table 10.1 Distribution of Moodle activities across courses

Moodle activities	Education	Social science	Engineering	Humanities and arts ^a			
	Course 1	Course 2	Course 3	Course 4	Course 5	Course 6	Course 7
Accessing resources	69	48	62	30	9	58	68
Submitting assignments (assignment, Turnitin assignment)	2	0	12	0	0	0	0
Taking tests (quiz, questionnaire)	2	0	15	0	0	0	0
Interaction (discussion forums, feedback, chatroom, choice)	9	0	3	3	1	6	0
Collaboration (wiki, glossary)	5	0	1	4	0	4	0
Total	87	48	93	37	10	68	68

Notes ^aThe instructor in Humanities and Arts taught four courses

course. The Education course was a Master level course and the other courses were on the undergraduate level. Table 10.1 summarizes the number of various Moodle activities across these courses.

10.3.2 Participants and Procedure

This study adopts a mixed method with survey and interview data collected and analyzed.

10.3.2.1 The Survey

The survey was conducted in the last class of the courses. 389 students from the seven courses were invited to participate in the survey. 253 students in total responded to the questionnaire with valid answers (65 % response rate). The responses were collected partially online (n = 142) and partially on paper (n = 111). Table 10.2 presents the demographic distribution of the participants.

10.3.2.2 The Interview

After the survey data were collected, emails were sent to 80 survey respondents (20 from each discipline) to invite them to the follow-up interviews. Twelve of them

Table 10.2 Demographic information of questionnaire respondents

	N	Gender		Moodle experience ^a	IT competency ^b
		Male	Female		
Education	17	3	14	1.71	2.88
Social science	57	25	32	2.41	2.93
Engineering	125	91	34	2.16	2.74
Arts	54	15	39	2.93	3.19
All	253	134	119	2.35	2.89

Notes. ^aRatings of “Moodle experience” are based on a 4-point Likert-type scale: 1—“less than 3 months”, 2—“3 months to less than 1 year”, 3—“1 year to less than 2 years”, and 4—“2 years or more”

^bRatings of “IT competency” are based on a 5-point Likert-type scale: 1—“not competent”, 2—“of little competency”, 3—“somewhat competent”, 4—“competent” and 5—“very competent”

accepted the invitation and participated in the interviews (3 in the Education course, 3 Social Sciences, 5 in Engineering and 1 in Humanities and Arts). The interviews were conducted partially face-to-face ($n = 2$) and partially through phone ($n = 10$). After the interviews, each interviewee was paid 30HKD for their participation.

10.3.3 Instruments

A questionnaire asking about the experience of using Moodle of the selected courses (Appendix 1) was used for collecting quantitative data. It included two parts: demographic information and frequency of course Moodle use. Part 1 asked for basic demographic information as well as their experience with Moodle and self-perceived IT competency level; Part 2 asked about the frequencies of using different categories of Moodle activities with variables in a 7-point Likert scale: ranging from 1 (never) to 7 (several times a day). A semi-structured interview protocol was designed to collect interview data. The main questions are shown in the following:

- What did you usually do when you access Moodle of this course via mobile phones? Why and why not using it for other purposes?
- Did you have any difficulties in using Moodle of this course using either computers or mobile phones? If yes, what were they?
- What kinds of supports do you think would be helpful when you encountered difficulties in using mobile phone to access Moodle of this course?

Table 10.3 Descriptive statistics of frequency of using Moodle via mobile phones

Moodle activities	N	Minimum	Maximum	Mean	Std. Deviation
Accessing resources	252	1	7	3.70	1.526
Submitting assignments	251	1	7	2.22	1.553
Taking tests	252	1	7	2.30	1.567
Interaction	251	1	7	2.06	1.457
Collaboration	252	1	7	2.08	1.508

Notes Ratings are based on a 7-point Likert-type scale: 1—"never", 2—"Once a month or less", 3—"Once every 2 weeks", and 4—"1–2 times a week", 5—"3–6 times a week", 6—"Once every day", 7—"Several times a day"

Table 10.4 Statistics of frequency of using Moodle via mobile phones across disciplines

Moodle activities		Humanities and Arts	Education	Social Science	Engineering	Sig. Kruskal–Wallis
Accessing resources	N	54	17	56	125	0.002**
	Mean	3.35	3.06	3.39	4.08	
	Median	4.00	4.00	4.00	4.00	
Submitting assignments	N	53	17	56	125	0.000**
	Mean	1.38	1.53	1.50	2.99	
	Median	1.00	1.00	1.00	3.00	
Taking tests	N	53	17	56	125	0.000**
	Mean	1.41	1.00	1.50	3.22	
	Median	1.00	1.00	1.00	4.00	
Interaction	N	53	17	55	125	0.000**
	Mean	1.69	1.35	1.62	2.52	
	Median	1.00	1.00	1.00	2.00	
Collaboration	N	54	17	56	125	0.000*
	Mean	1.43	1.24	1.55	2.71	
	Median	1.00	1.00	1.00	2.00	

Notes Ratings are based on a 7-point Likert-type scale: 1—“never”, 2—“Once a month or less”, 3—“Once every 2 weeks”, and 4—“1–2 times a week”, 5—“3–6 times a week”, 6—“Once every day”, 7—“Several times a day”

**Indicates significance at $p < 0.01$ level

10.4 Results

10.4.1 Questionnaire Responses

Table 10.3 shows the statistics of student self-reported usage of Moodle via mobile phones. Access to learning materials was the most frequent activity while interacting with instructors and other students was the least frequent. It is noteworthy that students’ responses varied from “never” to “several times a day” in all activity categories.

Statistics across different disciplines are presented in Table 10.4. Students in the Engineering course reported the highest frequency across all Moodle activities accessed via mobile phones among all participating students. As the data are in ordinal scale, the non-parametric Kruskal–Wallis test is used to compare the frequencies across courses. The significance levels (p values) are reported in Table 10.4. Statistically significant differences were found in all five categories of activities: accessing resources submitting assignments, taking tests, interaction and collaboration.

Experience of using Moodle may have affected students’ usage of Moodle via mobile access. Kruskal–Wallis tests revealed that students with different Moodle

Table 10.5 Descriptive statistics of frequency of using Moodle via mobile phones across experience of using Moodle

Moodle activities	less than 3 months		3 months to less than 1 year		1 year to less than 2 years		2 years or more		Sig. Kruskal–Wallis
	N	Mean	N	Mean	N	Mean	N	Mean	
Accessing resources	86	3.65	35	3.94	85	3.86	45	3.29	0.164
Submitting assignments	86	2.48	35	2.29	85	2.15	44	1.82	0.155
Taking tests	86	2.51	35	2.37	85	2.40	45	1.67	0.020*
Interaction	85	2.13	35	2.29	85	2.14	45	1.64	0.069
Collaboration	86	2.19	35	2.29	85	2.22	45	1.47	0.015*

Notes Ratings are based on a 7-point Likert-type scale: 1—“never”, 2—“Once a month or less”, 3—“Once every 2 weeks”, and 4—“1–2 times a week”, 5—“3–6 times a week”, 6—“Once every day”, 7—“Several times a day”

*Indicates significance at $p < 0.05$ level

experience reported significantly different usage frequency in taking tests and collaboration ($p < 0.05$, Table 10.5). Follow-up pair-wise tests revealed that, for both activity categories, students with “2 years’ or more” experience with Moodle actually reported lower frequencies than those with “less than 3 months” or “1 year to less than 2 years” experience ($p = 0.02 \sim 0.04$). There was no significant difference between other pairs of experience values.

Besides, difference in the frequency of using Moodle via mobile phones across IT competency was also analysed. Table 10.6 indicates a statistically significant difference of access frequencies in interaction and collaboration activities ($p < 0.05$). For interaction, a follow-up pair-wise test found that students who rated themselves as “not competent” reported significantly more frequent access than those who rated themselves as “somewhat competent” ($p = 0.02$) or “competent” ($p = 0.03$). For collaboration, students who rated themselves as “not competent” reported significantly more frequent access than those who rated themselves as “competent” ($p = 0.04$). There was no significant difference between other pairs of IT competency values.

The study also compares the difference of reported usage frequency between genders, and the statistics and results of Mann–Whitney tests are shown in Table 10.7. There are statistically significant differences in all activity categories but accessing resources. Results showed that male students displayed a higher self-reported frequency in Moodle activities including submitting assignments, taking tests, interacting and collaborating with one another.

Table 10.6 Descriptive statistics of frequency of using Moodle via mobile phones across IT competency

Moodle activities	Not competent		Of little competency		Somewhat competent		Competent		Very competent		Sig. Kruskal–Wallis
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	
Accessing resources	29	3.83	54	3.91	96	3.75	59	3.44	12	3.58	0.5
Submitting assignments	29	2.83	53	2.21	96	2.08	59	2.19	12	2.25	0.145
Taking tests	29	2.76	54	2.31	96	2.17	59	2.27	12	2.50	0.26
Interaction	29	2.79	54	2.09	96	1.96	59	1.93	11	1.82	0.018*
Collaboration	29	2.69	54	2.22	96	1.97	59	1.90	12	1.92	0.032*

Notes: Ratings are based on a 7-point Likert-type scale: 1—“never”, 2—“Once a month or less”, 3—“Once every 2 weeks”, and 4—“1–2 times a week”, 5—“3–6 times a week”, 6—“Once every day”, 7—“Several times a day”.

* Indicates significance at $p < 0.05$ level

Table 10.7 Difference of frequency of using Moodle via mobile phones between genders

Moodle activities	Male		Female		Sig. Mann–Whitney
	N	Mean	N	Mean	
Accessing resources	133	3.79	119	3.61	0.341
Submitting assignments	118	2.55	118	1.85	0.002**
Taking tests	133	2.74	119	1.80	0.000**
Interaction	132	2.31	119	1.79	0.040*
Collaboration	133	2.38	119	1.75	0.003**

Notes Ratings are based on a 7-point Likert-type scale: 1—“never”, 2—“Once a month or less”, 3—“Once every 2 weeks”, and 4—“1–2 times a week”, 5—“3–6 times a week”, 6—“Once every day”, 7—“Several times a day”

*Indicates significance at $p < 0.05$ level

**Indicates significance at $p < 0.01$ level

10.4.2 Themes from Interviews

Table 10.8 presents several representative quotes from students’ responses to the questions on how and why they used mobile access to Moodle to carry out the corresponding activities.

All interviewed students answered that they used mobile phones to access Moodle of their courses, because using mobile phones allowed them to access Moodle at any place and any time. They could read learning materials and important information such as assignment deadlines when no computer or Wi-Fi connection was available. Mobile access also enabled them to read announcements, comments and feedback as soon as they were available online. Students’ tendency in using Moodle for resource depository and information retrieval in this study demonstrated consistency with previous studies on students’ perception on Moodle (Kennedy 2005; Carvalho et al. 2011). The students from the Engineering course

Table 10.8 Representative quotes from the interviews

Moodle activities	Students’ responses
Accessing resources	Student A: <i>I would download some information [into my mobile phone’s storage]. Whenever or wherever I want to view it, using mobile phones comes in more convenient</i>
Submitting assignments	Student B: <i>If I need to submit assignments, I would not use my mobile, as the files are not in my mobile phone</i>
Taking tests	Student C: <i>When I have turned off my computer, but I still want to change the answers [of the previously completed quiz]. I would then quickly use it [mobile phone]. It is more convenient this way</i>
Interaction	Student D: <i>We preferred face-to-face discussion [to online interactions with groupmates]</i>
Collaboration	Student E: <i>[I] Never [used mobile access to Moodle for collaborative projects]. There are too many words in the project. So it is difficult to read on a small device</i>

($n = 5$) also mentioned that they used mobile phones in class to access Moodle because one of the course requirements was to complete a short quiz within 4 h after each class. Therefore, when the students did not bring their laptop to class, they would use mobile phones to finish the quizzes.

However, students also indicated that using mobile phones was not a preferred method to access Moodle. Most of them referred to usability issues such as small screens and an awkward keyboard. As a result, they would only be comfortable to conduct simple and low-stake tasks using mobile access. It was a common theme among students that the Mobile Theme of Moodle was inconvenient. To start a Moodle session on mobile phones, they needed to launch a browser window/tab, type in the URL, and log into the system. As the session expired after a short period of idle time, students had to log in again virtually at each time of access. Besides, the display of Moodle course pages on mobile phones was mentioned quite often during the interviews. All the course pages contained a rich amount of information. While the texts on the course pages were well displayed on computer screens, with proper headings and indentions, the format could become cluttered on the screen of mobile phones. Moreover, a majority of interviewed students preferred face-to-face discussion when working on collaborative projects, rather than using mobile phones for online interaction. Mobile interaction was only a choice when group members could not gather at the same time. Last but not least, several students mentioned that they did not know how to upload files to Moodle from their mobile phones or to find files to be downloaded from Moodle.

10.5 Discussion

Both the survey and interview data indicated that students used mobile phones to access Moodle for learning materials much more often than for other activities (Table 10.3), which indicates that the use of mobile access to Moodle was still at the lowest level as suggested in Francis and Raftery (2005). One possible reason is that the usability limitations of mobile access discouraged the students from using it for complicated tasks (e.g., Wiki edits, discussion posts) or activities that were deemed not urgent. Such usability limitations echo with the view of Kouninef et al. (2012) on the constraints of mobile learning using mobile technologies. In addition, depositing learning materials is the most widely used function of Moodle across all courses in this study, and there were much fewer Moodle activities related to interaction and collaboration across these courses (Table 10.1). Also, a possible reason for limited interpersonal interaction on Moodle is its inadequate design for mobile interaction (Ssekakubo et al. 2013), though usability issues like small screens seem to outweigh this technical inadequacy.

The distribution of Moodle activities shown in Table 10.1 could partially explain the significant differences on students' self-reported Moodle usages via mobile

phones presented in Table 10.4. For accessing resources, a pair-wise test following the Kruskal–Wallis test reveals that the only significant difference ($p = 0.02$) lied in between the Engineering course and the courses in Humanities and Arts where much fewer learning resources were hosted in two of the courses. The Moodle of the Engineering course had substantially more assignments and test activities than others, and this could justify why the frequencies of using these activities reported in this course were significantly higher than those of all other courses ($p < 0.01$). In addition, the quizzes in the Engineering course were designed in small sizes, with 3–5 multiple choices questions in each, and students reflected that they felt comfortable to access those quizzes via mobile phones since they only spent a little time to complete and did not involve much typing on the keyboard. On the grounds that students held positive attitudes towards accessing short quizzes via mobile access to Moodle, a recommendation for promoting mobile access to Moodle is that instructors could make adjustments to the course design by adding in-class online short quizzes as an additional assessment task, so that it would be desirable for students to access Moodle via mobile phones during class time or soon after classes.

For interaction and collaboration activities, even though the Engineering course had fewer activities in these two categories compared to other courses, the reported usage frequencies via mobile phones were still significantly higher than those in other courses (Table 10.3). This result suggests that creation of Moodle activities that are designed for interaction and collaboration does not necessarily result in more frequent access to those activities via mobile phones. Students from the Engineering course reported that they felt there was a learning community built on the course Moodle (Shea et al. 2006). There were a variety of learning activities that involved interactions and collaborations, including a group project, a group presentation and peer assessments (inter- and intragroups) (Lei et al. 2013). In addition, the instructor and teaching assistants responded to students' posts in a timely manner. These may all have contributed to the stronger motivations of the students in accessing the course Moodle via mobile phones. Accordingly, it is recommended that interactive and collaborative learning activities like peer assessments and group projects should be implemented in the future course design, as students could opt for contributing to these tasks using mobile access to Moodle at their convenience. Besides, instructors and teaching assistants need to be more responsive and more active in facilitating student interactive activities.

Interestingly, the results also revealed that students who have used Moodle for a shorter period of time tended to use mobile access more often to take tests and collaborate on Moodle than those who have used Moodle for 2 years and more (Table 10.5). In addition, students with low self-perceived IT competency used more mobile access to Moodle for interaction and collaboration activities (Table 10.6). These seem to contradict with many studies where experience and IT competency are positively associated with technology usage (Venkatesh and Bala 2008). Such findings could potentially supplement previous research on the relationship between IT competency and technology usage patterns. We conjecture that

the statistics might have been dominated by the students in the Engineering course who rated higher usage frequencies and lower Moodle experience and IT competency than other students. However, this would need further analysis to be confirmed.

The study also found male students used mobile access significantly more often than female students in all listed Moodle activity categories except for resource access. During the interviews, some female students complained about the complexity of some Moodle activities and expressed the need of instructional help on using those activities. Such gender differences have also been found in other studies on gender difference in educational technology (e.g., Heemskerk and Dam 2009), as well as in studies on the significance of gender differences in users' perceived usefulness of e-learning (e.g., Ong and Lai 2006). An implication is that providing instructions on how to use Moodle activities, especially with mobile access, would be helpful for users of both genders and would reduce the feeling of complexity to female students. On another note, student gender distributions vary a lot across the courses and the Engineering course was the only one with much more male than female students (Table 10.2). Therefore, it is possible that the observed gender difference may be partially affected by the higher ratings among students in the Engineering course.

10.6 Conclusion and Future Work

This study compared the usage patterns of Moodle for different activities via mobile phones among college students enrolled in courses across four disciplines, and analysed the reasons behind these usage patterns.

In general, students in this study did not prefer using their mobile phones to access Moodle, due to the limitations of mobile access on usability and reliability. However, most of them indeed used mobile phones to access Moodle when it was necessary. In terms of Moodle activities, it was found that students preferred carrying out easy and low-stake Moodle tasks on their mobile phones, such as accessing learning materials. The students expressed the need for a more user-friendly mobile access. In comparing survey responses from students across the courses, it was found that good pedagogical design could at least partially mitigate the limitations of mobile access and encourage students to use Moodle more often for activities involving interaction and collaboration.

A possible limitation of this study is that the data collection was limited to a single university (HKU) in Hong Kong. Since different universities might employ their own LMSs in different ways, resulting in variant perceptions with and opinions on the LMS, the conclusion made in this study might not be generalizable to all universities. Follow-up studies can expand the sample by recruiting participants from different universities and in different regions. Another limitation is that the findings of this study are solely based on self-reported data from participants, which might be subject to the difference in students' own perception. Future studies could

rely on objective data sources such as the usage patterns as reflected in the LMS system logs.

This study focused on examining the activity-specific usage patterns of Moodle via mobile access, while paying relatively less attention to students' opinions on mobile access to LMS, such as perceived usefulness. Future work will include the analysis of students' perceptions on the usefulness of mobile access to Moodle and the factors that might affect their perceptions. Also, in forthcoming studies, LMS system logs will be collected for further analysis of students' behaviour on Moodle.

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Appendix 1: Questionnaire

Part 1: Demographic information

What is your gender?

How old are you?

Where did you spend most of your life?

How long have you used Moodle?

Have you ever used any other learning management systems?

What is your IT (information technology) competency level?

Part 2: Frequency of using different Moodle functions

I used Moodle of this course via mobile phones to access learning materials (e.g., slides, notes, readings, assignments)

I used Moodle of this course via mobile phones for submitting assignments.

I used Moodle of this course via mobile phones for taking tests/quizzes/exams.

I used Moodle of this course via mobile phones for interacting with instructors/classmates (e.g., replying to posts, sending messages, chatting, etc.).

I used Moodle of this course via mobile phones for collaborating with classmates (e.g., editing wikis, contributing to glossary, discussing group projects, etc.).

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Author Biographies

Xiao Hu an Assistant Professor in the Division of Information and Technology Studies in the Faculty of Education of the University of Hong Kong. Her research interests include learning analytics, applied data/text mining, and information retrieval. She is leading several projects on using learning analytics to improve teaching and learning, and has co-organized Learning Analytics Summer Institute, LASI-Hong Kong in 2013 and 2014. Dr. Hu holds a Ph.D. degree in Library and Information Science and a Master's degree in Computer Science, both from the University of Illinois at Urbana-Champaign.

Leon Chi Un Lei received his B.Eng. (first class honors) and Ph.D. in Electrical and Electronics Engineering from the University of Hong Kong (HKU) in 2006 and 2011, respectively. He is now an E-learning Technologist in the Technology-Enriched Learning Initiative, HKU. He is also an Honorary Assistant Professor in the Department of Electrical and Electronics Engineering, HKU. His current research interests include learning analytics, MOOC and smart learning environment. He was awarded with the Best Paper Award in IEEE TALE 2013 and IAENG IMECS 2012, Best Student Paper Award in IAENG IMECS 2010 and IAENG IMECS 2007.

Jinbao Li an Assistant Professor in the Department of Geography at the University of Hong Kong. He received his Ph.D. degree in Earth and Environmental Sciences from Columbia University in 2009. His research centers on long-term variations in El Niño, the most powerful inter-annual climate force on Earth, and the Asian monsoon, the most crucial climate system to the Asian community. He carries out diagnostic studies using both instrumental and proxy records to gain insights into long-term climate dynamics and their impacts on society. He teaches courses related to climate change, ecosystem and contemporary global environmental issues.

Nathalie Iseli-Chan has been teaching French as a foreign Language for over 10 years, 7 of which with the support of web 2.0 technologies. Since 2007 she has been developing and devising Moodle based activities, including self-directed, self-assessed and cross level activities, aiming at bridging the gap between language learning and teaching, and building online learner communities. She joined the School of Modern Languages and Cultures 5 years ago. Her research interests include language learning and teaching strategies as well as the pedagogical application of new technologies to learning and teaching French as a foreign language.

Felix L.C. Siu has a solid background in Computing and Science Education with many years teaching experience in primary, secondary and tertiary education. He is senior lecturer in the Division of Information and Technology Studies, Faculty of Education at The University of Hong Kong. His research interests and experiences are diverse, covering areas such as multimedia in education, information literacy, information management, information and communication technology in education, and mobile & ubiquitous technology in Education. He has published, as author or co-author, many academic papers on the use of ICT in education.

Samuel Kai Wah Chu the Head of Division of Information and Technology Studies and an Associate Professor at the Faculty of Education, The University of Hong Kong. He is also the Deputy Director of Centre for Information Technology in Education in the Faculty. His publications include articles, books and key journals in the areas of IT in education, information and library science, school librarianship, academic librarianship and knowledge management. He has been involved in over 50 research/project grants and is also the recipient of his Faculty's Outstanding Researcher Award in 2013.