Exploring college students' usage experiences, perceptions and acceptance of mobile English learning in Taiwan

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Abstract

The increasing demand for mobile learning is visibly driving educators to rethink their pedagogical theory in today's Internet-enhanced society. This research reported and analyzed the survey results of 450 college students in Taiwan who used mobile English learning (MEL) with regards to usage frequency, perception, and acceptance. Positive results were indicated by high values for all three variables among students in Taiwan. Most participating respondents believed that they were comfortable and ready for MEL. The most frequently used MEL applications are listening to music, watching movies, using a dictionary and accessing social network sites. Additional analysis revealed that students believed MEL would change the way they learn English and would increase their learning achievements. They also expected to adopt more MEL functions in the classroom because such functions are fun and motivating. There was a strong positive relationship between perception and acceptance of MEL. Statistically, significant differences were identified in the perception and acceptance of MEL between males and females, and between usage frequency and perception of MEL in terms of students' school area.

Keywords: Mobile English learning (MEL); perception; acceptance; English as a foreign language (EFL); university students.

1. Introduction

Widespread research and theory indicates that mobile devices used as student learning tools may be beneficial for self-learning and classroom use (Chen & Huang, 2010; Chang, Chen, & Hsu, 2011; Hwang & Chang, 2011; McConatha, Praul, & Lynch, 2008; Stockwell, 2007). Mobile learning can be tailored to fit the individual needs of a student (Huang, Huang, Huang, & Lin, 2012; Martin-Dorta, Saorin, & Contero, 2011; Rau, Gao, & Wu, 2008), can offer support and enhance learning motivation (Hsu, Hwang, & Chang, 2013), and encourage achievement through the appropriate use of mobile technology (Dye, Solstad, & K'Odingo, 2003, Shuib, Shamshirband, & Ismai, 2015). Many educational researchers have also cited appealing and sustained improvements in academic outcomes as the key rationale for using mobile English learning (MEL)

in curriculum delivery (Chen & Chang, 2011; Chen & Hsu, 2008; Gromik, 2012; Hsu, Hwang & Chang, 2013; Jia, Chen, Ding & Ruan, 2012; Sandberg, Maris & de Geus, 2011; Thornton & Houser, 2005; Viberg & Grönlund, 2013). Other researchers have also attempted to create an online learning platform using mobile devices to enhance students' vocabulary learning, pronunciation and writing skills (Cui, Bull, 2005; Jia, Chen, Ding, & Ruan, 2012; Wang, 2009). However, scant attention has so far been given to investigating learners' usage experiences, perceptions and acceptance of MEL. Usage experiences are defined as learners' usage of mobile device features for English language learning. Perception is defined as learners' viewpoints or opinions toward MEL in class and out of class. Acceptance refers to learners' perceived usefulness and the perceived ease-of-use of MEL, the degree to which a learner believes that using mobile devices would

enhance their English performance, and the degree to which a learner believes that using a mobile device would be free from effort.

In fact, although the concept of educational mobile devices was first proposed by Alan Kay in the 1960s, it was not until the 1980s that the term "mobile assisted language learning (MALL)" gained the worldwide attention of researchers (Najmi & Lee, 2009). Mobile language learning can be defined as the learning of EFL across multiple contexts, using mobile devices such as mobile phones, portable computers, tablets, MP3 players, e-book readers and handheld game consoles (Viberg & Grönlund, 2013). It can also be described as "any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies" (O'Malley et al, 2003, p.6). The appropriate usage of mobile technology helps to support and enhance learning motivation, interest, and achievement (Dye, Solstad, & K'Odingo, 2003). In this study, MEL is defined as a prevalent tool that contributes to EFL learning purposes anywhere, at any time and by any method via mobile devices in both formal and informal settings.

Today, most universities provide plentiful technological resources, complete with ubiquitous wireless Internet access and support for students' information technology needs when learning on campus. College students are frequent users of mobile technology and over 97% of college students own a cell phone (Kennedy, Krause, Judd, Churchward, & Gray, 2006), but are they ready to use it for English as a foreign language (EFL) learning? In addition, many professors regard MEL as a disruption to class learning and suspect the effectiveness of MEL. In a project conducted by Thornton and Houser (2005), it was found that mobile devices are increasingly being used by students in their English learning. Other studies have also demonstrated that students have a strong desire to use mobile devices for their learning needs (Lenhart, 2012; Mnaathr, Basha, Mohain, & Jamaludin, 2013). It has been proved that students as young as fifth graders are motivated and benefited by MEL in their learning (Sandberg, Maris & de Geus, 2011). It is also widely believed that students are competent in using mobile devices for their language learning purposes (Viberg & Grönlund, 2013). MEL has helped students to become

exposed to more writing and reading than ever before, ensuring a much higher level of appropriate usage of the target language.

Mobile learning is a field that is developing rapidly and findings related to the issue of association to the field of EFL can provide a variety of different perspectives for those who have a career in the field of MEL. Students' usage experiences, perceptions and acceptance of MEL affect the way they learn in class and out of school. To help clarify the context for MEL, this research aims to address: (1) college students' actual use of MEL for self-learning and classroom use; (2) the perceptions of college students regarding MEL as a learning tool; (3) the acceptance of college students regarding usefulness and the ease of use of MEL; (4) the relationship between usage frequency, perception and the acceptance of college students regarding MEL; and (5) the differences in usage frequency, perception and the acceptance of college students regarding MEL in terms of their background characteristics.

2. Research methods

2.1 Participants

A total of 450 usable responses were received from participating students attending 15 universities in Taiwan. Freshman and sophomore students were chosen because English courses are only required to be taken in the first two years of university in Taiwan. The general demographics of the survey participants are illustrated in Table 1. Of the students participating in the research, 138 (30.7%) were male and 312 (69.3%) were female. Most of the participants were under the age of 20 (95.1%). The participants' academic levels could be

Table 1. Descriptive statistics related to the participants.

Category		Count	Percent
Gender	Male	138	30.7
	Female	312	69.3
Age	Under 20	428	95.1
	21-25	21	4.7
	26-30	1	0.2
	30 and above	0	0
Academic	Freshman	249	55.3
	Sophomore	201	44.7
School area	North Taiwan	113	25.1
	Central Taiwan	222	49.3
	South Taiwan	115	25.6

further analyzed as 249 freshmen (82.9%) and 201 sophomores (44.7%). The majority of the participants (n=222, 49.3%) were from the central area of Taiwan.

2.2 Instrument

To obtain the data, a series of questionnaires were developed as a result of individual interviews between the researchers and several college professors and students, and these were then modified after a pilot study to fit the purposes of this study. Several measurements for mobile learning attitudes/perceptions and technology acceptance were also taken into consideration, such as students' attitudes and perceptions regarding the effectiveness of mobile learning by Al-Fahad (2009), a survey on students' mobile phone usage preferences and perceptions (Head & Ziolkowski, 2012) and the technology acceptance model (TAM) (Venkatesh & Davis, 2000). Initially, 115 questionnaire items were extrapolated, following which a pilot study was conducted to refine and rationalize the items using the participation of 112 students who were not included in this research.

The MEL questionnaire was further reduced to 100 items with a Cronbach alpha reliability of 0.957. The survey was refined from feedback following pilot testing. It was then prepared in Chinese, finally consisting of 52 items on MEL usage experiences, 20 items on perception (MEL in class and out of class), and 28 items on the acceptance of MEL applications (usefulness and ease of use). Four demographic questions regarding gender, age, year level and school area were introduced to ensure an increased depth of analysis. A five-point Likert scale ranging from "strongly agree" to "strongly disagree" was used for all questions except the demographic questions.

Table 2. Internal consistency reliability for the MEL questionnaire.

	Cronbach's Alpha	N of Items
Usage experiences	.861	52
Perceptions	.925	20
Acceptance	.950	28
Overall	.957	100

2.3 Procedures and data analysis

The population of this study was college students who were freshmen and sophomores at Taiwanese universities. Invitations to instructors were sent by e-mail to ask for help in distributing the questionnaires to students in class. The survey instrument was then delivered to the cooperating teachers via a mailing service. A total of 450 valid questionnaires were returned by students. Students completed the questionnaire in class in approximately 15-20 minutes with the cooperating teachers' instructions. Participants were assured of their anonymity, and that the data would only be used for research purposes. Their participation was entirely voluntary and did not have any effect on their grades.

Using the statistical SPSS software, the descriptive data analysis first reported on the background characteristics of the participants. It was then used to describe the usage experiences and to ascertain the agreement levels stated by the participants. The five-point Likert items with an average agreement level of 2.59 or below were considered "low", those with an average agreement level of 2.60–3.39 were neither rejected nor approved and were considered as "medium", and those with an average agreement level of 3.40 or above were considered as "high". T-tests were also carried out to check for significance. Then, the Pearson product-moment correlation coefficient was conducted to determine how strong the relationship was among the variables. Finally, F values obtained from an ANOVA test were calculated to ascertain whether the usage experiences, perceptions, and acceptance varied according to the demographic variables.

3. Results

3.1 Usage experiences of MEL

In accordance with the research motivations of this study, a survey was conducted to ascertain and understand the usage experiences of the participants. When asked about the features of mobile devices used for MEL, participants regarded a music player (68.4%), dictionary (59.4%), English learning APP (54.6%) and video player (52.8%) as being important and valuable. The results also demonstrated that the Internet (48.8%) and social networking sites (40.9%) had a medium level of usage with regards to the overall utilization of mobile phones. The usage of mobile device features by the

participants is listed in Table 3. It is evident that students utilize their mobile phones to assist with their English learning.

Table 3. The usage of mobile device features.

Category	Responses		Percent (%)
	N	Percent (%)	
Phone Call	63	3.2	14.2
Music player	303	15.6	68.4
Video player	234	12.0	52.8
Voice recorder	172	8.8	38.8
Video recorder	45	2.3	10.2
Word processor	119	6.1	26.9
English learning APP	242	12.4	54.6
Dictionary	263	13.5	59.4
Internet	216	11.1	48.8
Social networking sites (e.g. Line, Skype, FB)	181	9.3	40.9

Table 4 provides the results of the multiple response analysis for mobile device applications used both in class and out of class by the participants. The MEL functions used by most students in class were to help with completing assignments (67%) and viewing course materials (50.3%) whilst functions for practicing English (60%) and for self-learning (48.2%) were used mostly out of class. Only 26 students had never used a mobile device application in their EFL class and six had never used one for self-learning out of school. This indicated that the students had recognized mobile devices as learning tools and had used different applications in and out of class. It is worth mentioning that more than 30% of the students had used a mobile device for online assessment purposes both in and out of class. This might be due to the fact that the students and their instructors had realized the effectiveness and convenience of taking tests online.

Regarding the frequency of students' usage of MEL applications, all items in this part of the survey were constructed as always/never statements on a five-

Table 4. The use of mobile device applications.

	Category	Responses		Percent (%)
		N	Percent (%)	
In class	Learning management system (LMS) or course website	72	4.7	16.3
	View course materials	223	14.6	50.3
	Complete assignments	297	19.4	67.0
	Practice English	202	13.2	45.6
	Online group discussion	152	9.9	34.3
	Online assessment	137	8.9	30.9
	Self-learning	109	7.1	24.6
	Oral presentation	109	7.1	24.6
	English listening and speaking activity	101	6.6	22.8
	English reading and writing activity	104	6.8	23.5
	I have never used MEL	26	1.7	5.9
Out of class	LMS or course website	82	6.1	18.7
	View course materials	207	15.3	47.3
	Complete assignments	208	15.4	47.5
	Practice English	263	19.4	60.0
	Online group discussion	125	9.2	28.5
	Online assessment	133	9.8	30.4
	Self-learning	211	15.6	48.2
	Communication with instructors and classmates	118	8.7	26.9
	I have never used MEL	6	0.4	1.4

Table 5. Frequency of MEL applications.

	Frequency (%)					Mean	SD
	5	4	3	2	1		
Social networking sites (e.g. Line, Skype, FB)	29.1	18.6	22.6	20.6	9.2	3.38	1.335
View course material (e.g. handouts, e-books, online materials)	4.3	24.3	43.0	23.9	4.5	3.00	.914
Complete assignments	17.0	33.9	33.7	12.1	3.3	3.49	1.017
Send and receive email	6.7	13.4	29.8	37.0	13.1	2.63	1.080
Send and receive text messages	6.3	11.4	23.2	35.5	23.7	2.41	1.149
Search for learning materials	12.0	32.3	39.2	13.4	3.1	3.37	.964
Upload learning materials	6.0	18.0	42.1	22.7	11.1	2.85	1.036
Play English learning games	3.3	10.9	30.7	36.5	18.5	2.44	1.018
Listen to English songs	42.9	34.7	19.1	2.4	.9	4.16	.879
Watch English movies/films	28.7	36.3	25.2	8.0	1.8	3.82	.995
Participate in online group discussion	6.0	20.0	37.8	25.6	10.7	2.85	1.050
Use a dictionary	23.8	29.3	25.6	16.4	4.9	3.51	1.162
Use an English learning APP	8.9	16.7	32.2	26.4	15.8	2.76	1.168
Take notes	7.6	23.3	42.1	19.2	7.8	3.04	1.022
Access LMS or course web sites	4.7	13.1	31.0	29.2	22.0	2.49	1.112
Take online tests	12.0	26.2	33.6	16.4	11.8	3.10	1.171
Access English learning websites	4.0	16.1	41.3	29.2	9.4	2.76	.966
Access English learning blogs or wiki	4.8	15.2	36.3	30.7	12.9	2.68	1.041

5 = always, 4 = often, 3 = occasionally, 2 = rarely, 1 = never

point Likert scale, as summarized in Table 5. The major finding is that most applications were used by more than half of the participants occasionally to always, except for English learning games, sending and receiving email, sending and receiving text messages, accessing LMS or course web sites, or accessing English learning blogs or wiki. The applications used frequently by students are those that enable them to listen to English songs and watch English movies/films, and visit social networking sites, which matches the fact that students mostly use a mobile device for self-directed informal learning (Huber & Ebner 2013) and to socialize online (Mezgár & Kräuter, 2012).

3.2 Perceptions of MEL

Table 6 presents the responses from the student participants to the 20 closed questionnaire items on a Likert scale of 1–5. T-tests were carried out to check for significance. As the table shows, students perceived a high level of overall perception toward the use of MEL (M=3.42), a medium level of perception toward in class learning (M=3.31), and high level of perception toward out of class learning (M=3.54). This result reveals the

fact that students mostly remain highly perceptive of MEL and agree that MEL has a positive impact on their English learning.

3.3 Acceptance of MEL

Table 7 presents the responses from students to the 28 closed questionnaire items using a Likert scale of 1–5, along with a comparison of means. T-tests were carried out to check for significance. As the table shows, the student participants expressed a high acceptance level for MEL (M=3.52); a high level of acceptance toward usefulness (M=3.50) and a high level of acceptance toward ease of use (M=3.54). This result reveals the fact that students are highly accepting of MEL.

3.4 The relationship between usage frequency, perception and the acceptance of MEL among college students

The relationship between usage frequency, perception and acceptance was explored to answer research question four. The results of the correlational analysis are presented in Table 8. It indicates that students' usage frequency correlated positively with their perception

Table 6. Perception of MEL among students.

		Mean	SD	N	Sig.
Perceptions – in class		3.31	.572	442	.000*
1.	I am interested in learning English by using a mobile phone	3.56	.903	448	.000*
2.	MEL has been applied in various EFL learning activities	3.25	.973	448	.000*
3.	I prefer MEL courses to traditional courses	3.47	.938	448	.000*
4.	MEL should be used in class regularly	3.31	.934	447	.000*
5.	MEL increases my desire to learn English	3.52	.889	446	.000*
6.	Recent developments in MEL are leading to the exploration of new methods/models at universities	3.61	.850	446	.000*
7.	I feel bored using a mobile device	2.39	.887	446	.000*
8.	MEL is widely applied to EFL learning	3.17	.852	446	.000*
9.	I am confident about using mobile devices for English learning	3.24	.779	445	.000*
10.	I am looking forward to engaging in MEL	3.56	.863	446	.000*
Perceptions – out of class		3.54	.639	441	.000*
11.	MEL can be integrated seamlessly to support informal learning	3.48	.876	446	.000*
12.	Students love to learn English using mobile devices out of class	3.58	.839	446	.000*
13.	I am more willing to ask questions when using a mobile device	3.47	.880	446	.000*
14.	MEL will change the way I learn in the future	3.65	.836	444	.000*
15.	MEL has a positive impact on my English learning	3.57	.856	445	.000*
16.	MEL could bring enormous opportunities to further empower English learning	3.61	.805	444	.000*
17.	MEL makes English learning more fun	3.64	.848	443	.000*
18.	MEL can replace computers and other learning technologies	3.53	.880	443	.000*
19.	MEL allows me to undertake more interesting and imaginative work	3.34	.928	444	.000*
20.	In general, I am willing to use MEL out of class	3.50	.870	444	.000*
Overall perception		3.42	.562	437	000*

and acceptance of MEL (r=4.66, p<.05; r=.462, p<.05, respectively). Students' perception and acceptance of MEL had a much stronger positive correlation (r=.856, p<.05). This indicates that as students' perceptions increase, their acceptance also increases.

3.5 Usage frequency, perception and acceptance of MEL in relation to students' background characteristics

The fifth research question investigated whether there were significant differences between the participants' age and their usage frequency, perception and acceptance of MEL, together with background characteristics (gender, age, position, year level and school area). As shown in Table 9, a one-way ANOVA result revealed a significant

difference in the perception and acceptance of MEL with relation to the participants' gender. Tukey's post hoc tests were also administered to determine how male and female students differed. Female students demonstrated significantly higher levels of perception, $F_{(1, 435)} = 6.412$, $p < 0.05$, M=3.47, and acceptance, $F_{(1, 421)} = 7.3159$, $p < 0.05$, M=3.57, toward MEL than the male students.

This result corresponds to the conclusion of the study conducted by Viberg and Grönlund in 2013 that, with regards to background characteristics, states that gender is the most important predictable factor for students' attitudes toward MEL. In both cases, female students were more positive toward the use of mobile language learning. From the aspect of school area, a one-way ANOVA revealed a significant difference between the students' school area on usage frequency and their perceptions of m-learning. Students in the northern school area reported a significantly higher frequency of MEL usage, $F_{(1, 437)} = 6.046$, $p < 0.05$, M=3.14, and more positive perceptions of MEL, $F_{(1, 437)} = 10.260$, $p < 0.05$, M=3.49.

Table 7. Acceptance level of MEL among students.

		Mean	*SD*	*N*	*Sig.*
Acceptance – usefulness		3.50	.576	431	.000*
1.	MEL helps me learn better in class	3.60	.783	446	.000*
2.	MEL has enhanced my English competency	3.52	.795	446	.000*
3.	MEL can simplify English learning	3.58	.822	445	.000*
4.	MEL helps me to learn beyond the classroom	3.61	.811	445	.000*
5.	MEL draws my attention to learning	2.80	.936	446	.000*
6.	MEL enables me to accomplish tasks more quickly	3.43	.862	444	.000*
7.	MEL improves the quality of the task I perform	3.49	.831	446	.000*
8.	MEL increases my productivity	3.48	.818	445	.000*
9.	MEL makes it easier for English learning	3.55	.838	446	.000*
10.	MEL enhances the effectiveness of English learning	3.53	.809	446	.000*
11.	MEL is useful in English learning	3.75	.825	446	.000*
12.	MEL brings new opportunities for English learning	3.81	.762	444	.000*
13.	MEL improves communication between student and teacher	3.17	.925	446	.000*
14.	MEL is a quicker way of getting feedback	3.53	.805	442	.000*
15.	MEL can provide immediate support	3.69	.788	443	.000*
16.	MEL is good for monitoring students' learning processes	3.29	.950	444	.000*
17.	MEL can provide a much wider variety of learning resources	3.85	.807	441	.000*
Acceptance – ease of use		3.54	.592	434	.000*
18.	Learning to use MEL is easy	3.78	.791	444	.000*
19.	It is easy to get a mobile device to do what I want it to do for English learning	3.59	.872	444	.000*
20.	It is easy to become skillful when using MEL	3.58	.840	444	.000*
21.	MEL is easy to use	3.51	.869	444	.000*
22.	MEL makes it possible to make choices about learning materials	3.85	.794	444	.000*
23.	MEL offers control over the place, pace, and time at which I learn	3.81	.798	442	.000*
24.	MEL provides immediacy for English learning	3.90	.759	444	.000*
25.	It is difficult to use mobile devices for English learning	2.76	.966	444	.000*
26.	I feel comfortable learning English by using a mobile phone	3.47	.909	441	.000*
27.	I am confident about using mobile devices for English learning	3.23	.958	445	.000*
28.	I know how to use a mobile device in class	3.38	.862	442	.000*
Overall acceptance		3.52	.554	423	.000*

4. Conclusion and practical implications

4.1 Research summary of the key research findings

From the results presented in the last section, we can see that due to the influence caused by the widespread nature of mobile technology, MEL is used frequently by college students. Despite that, college instructors are still uncomfortable and struggle to integrate mobile devices into their curriculum, whilst students enjoyed positive perceptions and high levels of acceptance toward MEL. The only positive medium strength relationships were observed between usage frequency and perception, and acceptance of MEL.

Statistically significant differences between the perception and acceptance of MEL were identified by student gender. Contrary to prediction, female students perceived significantly higher levels of perception and acceptance, even though males are considered better technology product users. This could be due to the fact that female students are better language learners and they tend to have higher levels of motivation (Coskum, 2014). A statistically significant difference between usage frequency and perception was further found in

Table 8. Pearson Correlation analysis results.

	Usage frequency	Perception	in class	out of class	Acceptance	usefulness	ease of use	*M*	*SD*
Usage frequency	1	.466*	.483*	.385*	.462*	.423*	.436*	3.05	.586
Perception	.466*	1	.920*	.936*	.856*	.865*	.753*	3.42	.562
in class	.483*	.920*	1	.722*	.709*	.730*	.614*	3.31	.572
out of class	.385*	.936*	.722*	1	.871*	.870*	.775*	3.54	.639
Acceptance	.462*	.856*	.709*	.871*	1	.945*	.948*	3.52	.554
usefulness	.423*	.865*	.730*	.870*	.945*	1	.792*	3.50	.576
ease of use	.436*	.753*	.614*	.775*	.948*	.792*	1	3.54	.592

*$P<0.01$

terms of students' school area. This, in fact, was an expected finding. As can be understood, students who go to universities located in northern Taiwan (mostly in Taipei, the capital) are provided with more updated information and resources and, therefore, have higher usage frequency and more positive perceptions of MEL.

4.2 Practical implications

In this study, more than 30% of the students had used a mobile device for online assessment purposes, both in and out of class. The results indicate that instructors have realized the effectiveness and convenience of

Table 9. One-way ANOVA Results.

			M	*SD*	*F*	*Sig.*
Usage frequency	Gender	Male	2.99	.666	1.896	.169
		Female	3.08	.546		
	Age	Under 20	3.06	.576	.847	.430
		20-25	3.03	.603		
	Year Level	Freshman	3.06	.574	.710	.400
		Sophomore	3.01	.637		
	School area	North	3.14	.547	5.046	.007*
		Center	2.93	.645		
		South	3.00	.576		
Perception	Gender	Male	3.32	3.32	6.412	.012*
		Female	3.47	3.47		
	Age	Under 20	3.43	.553	.847	.430
		20-25	3.41	.516		
	Year Level	Freshman	3.38	.479	.126	.723
		Sophomore	3.35	.548		
	School area	North	3.49	.415	10.260	.000*
		Center	3.41	.490		
		South	3.21	.525		
Acceptance	Gender	Male	3.45	3.41	7.315	.007*
		Female	3.57	3.57		
	Age	Under 20	3.53	.547	.030	.971
		20-25	3.51	.461		
	Year Level	Freshman	3.56	.501	.231	.631
		Sophomore	3.53	.553		
	School area	North	3.56	.523	2.325	.099
		Center	3.63	.426		
		South	3.49	.426		

*$P<0.05$

online assessments, such as increasing student engagement, providing instant feedback, the ability to take the exam anywhere and at any time, and the ability to quickly evaluate performance. Since students mostly use mobile devices for self-directed informal learning and to socialize online, educators must rethink current teaching strategies and appropriately prepare students for a more mobile-oriented learning environment.

There are two issues that could enhance the quality of this research. First of all, since the questionnaire design is partly based on semi-structured interviews and partly on the literature review, the interviews could include additional instructors and students from a variety of universities. Due to time and resource limitations, only five instructors and ten students from the different investigated universities were selected. The questionnaire would have been more comprehensive if interviewees had been included from more universities.

Secondly, the questionnaire merely measures students' usage experiences, perceptions and acceptance levels. Their options, attitudes and other variables of MEL could be taken into consideration. It is suggested that future studies should also investigate the impact of culture on MEL in experimental settings and in different countries. Another interesting road for further study is to compare usage experience, perception and acceptance between students and their faculty regarding the adoption of MEL. It would be interesting to know whether students' usage experiences, perceptions and their acceptance of mobile learning match those of their teachers.

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