Acceptance and Use of Mobile-Assisted Language Learning by Higher Education Language Teachers

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Abstract

Mobile-assisted language learning (MALL) is increasingly gaining attention from educational stakeholders. This quantitative study implements the Unified Theory of Acceptance and Use of Technology (UTAUT) model with the added variable of attitude. The participants were 89 Colombian higher education language teachers who shared their views on MALL via an online questionnaire. The results indicate that teachers' behavioral intention is influenced by their attitude, social influence and facilitating conditions. The study also highlights the importance of including use behavior in the measurement model: teachers who scarcely use MALL express stronger intentions to use it when compared to teachers with high MALL use, resulting in a negative correlation between behavioral intention and use behavior.

Key words: acceptance; higher education; language teachers; mobile assisted language
learning; UTAUT.

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Resumen

Aceptación y uso del aprendizaje de idiomas asistido por dispositivos móviles por parte de profesores de idiomas de educación superior

El aprendizaje de idiomas asistido por dispositivos móviles (MALL) está ganando mayor interés por parte de la comunidad académica. Este estudio cuantitativo implementa el modelo de aceptación UTAUT complementado con la variable actitud. Los participantes fueron 89 profesores de idiomas de educación superior colombianos que compartieron sus puntos de vista sobre MALL a través de un cuestionario en línea. Los resultados indican que la intención conductual de los profesores está afectada por su actitud, influencia social y condiciones facilitadoras. El estudio también destaca la importancia de incluir el comportamiento de uso en el modelo de medición: los maestros que poco usan MALL muestran intenciones más fuertes de usarlo en comparación con los maestros con un alto uso de MALL, lo que resulta en una correlación negativa entre la intención de comportamiento y el comportamiento de uso.

Palabras clave: aceptación; aprendizaje de lenguas asistido por dispositivos móviles; educación superior; profesores de idiomas, UTAUT.

Résumé

Acceptation et utilisation de l'apprentissage des langues assisté par mobile par les professeurs de langues de l'enseignement supérieur

L'apprentissage des langues assisté par mobile (MALL) attire de plus en plus l'attention des acteurs de l'éducation. Cette étude quantitative met en œuvre le modèle d'acceptation UTAUT étendu avec l'attitude variable. Les participants étaient 89 professeurs de langues de l'enseignement supérieur colombiens qui ont partagé leurs points de vue sur MALL via un questionnaire en ligne. Les résultats indiquent que l'intention comportementale des enseignants est influencée par leur attitude, leur influence sociale et leurs conditions de facilitation. L'étude met également en évidence l'importance d'inclure le comportement d'utilisation dans le modèle de mesure: les enseignants qui n'utilisent que rarement MALL montrent une intention de l'utiliser plus forte que les enseignants à forte utilisation de MALL, ce qui entraîne une corrélation négative entre l'intention comportementale et le comportement d'utilisation.

Mots-clés: acceptation ; enseignement supérieur ; professeurs de langues ; langue assistée par mobile apprentissage ; UTAUT.

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CÓMO CITAR ESTE ARTÍCULO

INTRODUCTION

The irruption of mobile technologies into everyday life has produced transformations in language teaching and learning (Kukulska-Hulme, 2009). As these technologies are expected to have a significant influence on the experience and performance of language learners (Mac Callum, & Jeffrey, 2013), interest in mobile learning is growing among language educators (Godwin-Jones, 2011). Nevertheless, some studies show that teachers still have qualms about the irruption of these devices in education. Classroom disruption (Lenhart, 2012), ethical issues, insufficient accessibility, technical limitations, lack of experience (Baran, 2014) and the belief that the laptop is a stronger learning tool than a mobile device (Şad & Göktaş, 2014) are ideas that continue to hinder more widespread acceptance and use of mobile learning in education. Since teachers play a key role in the implementation of new technologies in education, their positive attitude and acceptance of technologies are critical determinants of technology use (see Huang & Liaw, 2005; Nichols, 2008). Therefore, these aspects should not be neglected in mobile learning, particularly when mobile devices are beginning to be introduced in an educational setting (Mac Callum, 2010).

In the context of Latin America, it is likely that most teachers currently own a mobile device and feel comfortable using it (Jara et al., 2012). As a consequence, there are minimal efforts to support teacher development regarding mobile learning (Jara et al., 2012). This assumption neglects to consider the likelihood that teachers' acceptance and use levels may differ in personal and educational contexts. Therefore, by taking MALL as a focus in the Colombian higher education teaching context, this paper addresses the following research objectives:

1. Develop and statistically verify an acceptance instrument specific to teachers' acceptance of MALL based on the variables in the UTAUT acceptance model.
2. Assess the factors affecting behavioral intentions of MALL among Colombian foreign language university teachers.
3. Identify the actual use of MALL for teaching purposes among Colombian higher education language teachers.

LITERATURE REVIEW

Mobile learning and MALL

Mobile learning is commonly ill-defined: "it seems to be all things to all people" (Sharples, 2006, p. 5). In general, mobile learning is a branch of ICT in education (Kraut, 2013) and a descendant of e-learning (Laouris & Eteokleous, 2005; Sharples, 2000). Umbrella definitions of mobile learning and mobile-assisted language learning (MALL) refer to the learning that occurs in spaces, taking into account the mobility of technology, mobility of learning and mobility of learners (El-Hussein & Cronje, 2010; Pegrum, 2014). Accordingly, mobility of technology includes mobile devices, among

other technologies. Mobility of learning focuses on the instructional delivery method whilst the mobility of the learner considers the different ways learners engage in ongoing learning activities, individually and as a part of a community.

Under a predominantly technocratic perspective, mobile learning and MALL are viewed as approaches to learning which are assisted or enhanced through the use of handheld mobile devices (Begum, 2011; Burston, 2013). These two concepts are just in their emerging phase and under theorized in teacher education (see Kearney & Maher, 2013; Morchid, 2020; Viberg & Grönlund, 2013). Existing meta-analysis indicates that learning with mobile devices has a higher significant effect-size on learning effectiveness when compared to using pen-and-paper or desktop computers (Grgurović et al., 2013; Sung et al., 2015).

From a pedagogical perspective, MALL has proven to have a positive effect on students' academic performance, as well as on aspects such as attitude, motivation, and linguistic proficiency. However, there is an evident need to appropriately guide the use of MALL in the educational context so as to be able to institutionalize the use of educational platforms, applications, social networking sites, game-based learning, etc as formal pedagogical practices. (Morchid, 2020).

Considering the current global context of biosecurity protocols due to SARS-CoV-2 (COVID-19), there is no doubt that mobile-assisted learning and MALL will play a significant and growing role in the way in which education is imparted; thus, a conceptual framework that places mobile-assisted language learning as a core element in education is now a priority.

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## Acceptance models in mobile learning

Given that the acceptance of technology relies in large part on users' beliefs and attitudes (Venkatesh et al., 2003), acceptance models are a useful tool when analyzing different technological approaches. The Technology Acceptance Model (TAM) has been used as a reference to measure students' (e.g., Soleimani et al., 2014) and teachers' acceptance (e.g., Jung, 2015; Mac Callum et al., 2014; Sánchez-Prieto et al., 2016). Despite being a useful model, the original TAM lacks variables related to both human and social change processes (Legris et al., 2003). Therefore, there is a need to include other variables that better explain technology adoption (Legris et al., 2003).

One model widely used to measure technology acceptance is the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003). Interest in the UTAUT is growing, largely due to its synthesis of eight different acceptance models and its capacity to explain behavioral intention better than any other single acceptance model (Marchewka & Kostiwa, 2007). Regarding mobile learning, it has been implemented to measure acceptance in higher education (Abu-Al-Aish & Love, 2013; Jairak et al., 2009) and to analyze acceptance by developing countries (Iqbal & Qureshi, 2012; K. M. Thomas et al., 2013). Papers on research trends in MALL (e.g., Duman et al., 2015) have found just a handful of studies measuring acceptance of MALL.

Some studies researching the importance of MALL using the UTAUT model (García et al., 2018, 2019; Morchid, 2019) have analyzed students' acceptance of technology in education, showing that their attitudes towards MALL use are positive; however, the lack of institutionalization of educational technology plus the need for improvements in facilitating conditions are imperative challenges in higher education settings.

RESEARCH FRAMEWORK

The research framework of this study takes into account the UTAUT along with other factors studied in similar contexts. Our proposed research model is depicted in Figure 1.
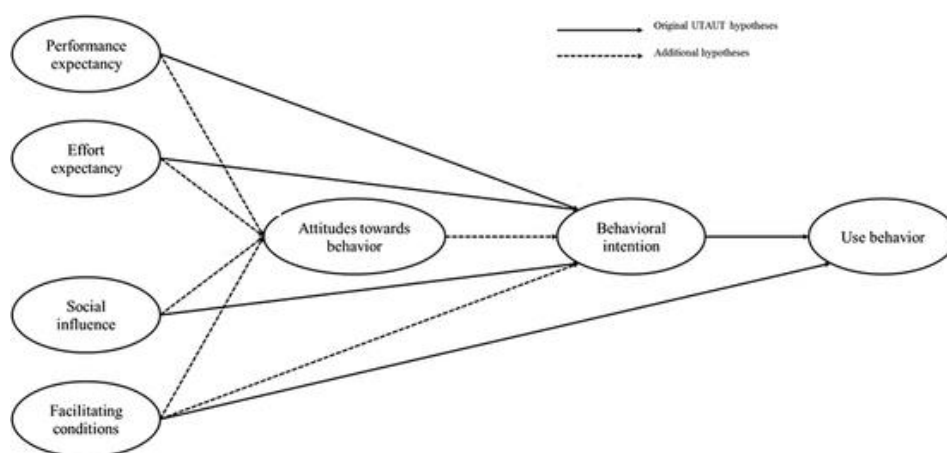
Figure 1. Proposed research model

The following are definitions of the constructs as explained by Venkatesh et al. (2003).

Performance expectancy

Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance. According to Venkatesh et al. (2003) performance expectancy is the strongest predictor of intention. The following hypothesis is proposed:

H1 Performance expectancy of teachers regarding MALL use has a significant positive relationship with behavioral intention.

Effort expectancy

Effort expectancy is the degree of ease associated with the use of the system. Perceived ease, complexity, and ease of use are constructs from other models that pertain to effort expectancy (Venkatesh et al., 2003). Studies on mobile learning suggest that effort expectancy is a strong predictor of behavioral intention for older users (Wang

et al., 2009). In MALL, many mobile learning designs require considerable technical knowledge for language teachers (Tai, 2012). The following hypothesis was formulated:

> H2 Effort expectancy of teachers regarding MALL use has a significant positive relationship with behavioral intention.

Social influence

Social influence refers to the extent to which an individual considers it important that others believe he or she should use the new system (Venkatesh et al., 2003). The study by Aubusson et al. (2009) recognizes that teachers share their knowledge and have the practical experience to know what will work and what will not. The study also highlights the influence of students in teachers' learning and empowerment in the use of mobile technologies. Students' influence lies in their spontaneity, immediacy, honesty and ability (Aubusson et al., 2009). Accordingly, the following hypothesis is proposed:

> H3: Social influence of teachers regarding MALL use has a significant positive relationship with behavioral intention.

Facilitating conditions

This factor is defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system (Venkatesh et al., 2003). The notion of facilitating conditions is explored in models such as the theory of planned behavior, the model of personal computer utilization, and innovation diffusion theory (Venkatesh et al., 2003). The following hypotheses are proposed:

> H4a: Facilitating conditions of teachers regarding MALL use have a significant positive relationship with behavioral intention.
> H4b: Facilitating conditions of teachers regarding MALL use is positively related to use behavior.

Behavioral intention

The UTAUT is completed by behavioral intention which is theorized to have a significant positive influence on technology usage (actual use). The study on teachers by Jung (2015) supports this claim in a MALL context. Other studies (e.g., Oz, 2014) indicate that pre-service teachers have the intention to use mobile devices in their lessons. The following hypothesis is proposed:

> H5: Behavioral intention of teachers regarding MALL use has a significant positive relationship with use behavior.

Attitude towards behavior

Attitude is not included in the resulting UTAUT model despite being a core construct in acceptance models such as the theory of reasoned action or the theory of planned behavior. Nonetheless, its role in technology acceptance models is still to be clarified (Nistor & Heymann, 2010). Attitude is defined as the positive and negative feelings about performing the target behavior (Fishbein & Ajzen, 1975) and the individual's overall reaction to using a system (Venkatesh et al., 2003). In teachers' acceptance of MALL, there are studies that show moderately positive (e.g., Dashtestani, 2012) and entirely positive attitudes (Oz, 2014). The following hypotheses are proposed:

> H6 Performance expectancy is positively related to attitude towards behavior.
> H7 Effort expectancy is positively related to attitude towards behavior.
> H8 Facilitating conditions is positively related to attitude towards behavior.
> H9 Attitude towards behavior is positively related to behavioral intention.

Use behavior

Although it is included in the original UTAUT, actual use has surprisingly been overlooked when assessing MALL acceptance of teachers. Since most teachers are now in possession of mobile devices, it is crucial to know whether they are using these devices for their instruction. The need to fill this gap has been highlighted by similar studies (see Aubusson et al., 2009; Jung, 2015) and therefore it is addressed in the present study.

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METHOD

This quantitative research is a cross-sectional study, since the data was collected in a single period, at a specific time (Hernández et al., 2014). It has a descriptive and exploratory scope (Hernández et al., 2014) since it provides descriptive statistics for the UTAUT-based survey constructs and the "attitude" variable as an important source of information to better analyze the data collected has not been explored previously in measuring acceptance of MALL. Furthermore, mobile learning and MALL are two concepts that are in their infancy, and still need strong theoretical and pedagogical foundations to reach their full potential (Morchid, 2020).

Instrument development

To test the formulated hypotheses, quantitative research in the form of an online questionnaire-based survey was conducted. Empirical data was collected from a 51-item survey conducted via Limesurvey, an open source system to record, collate, and publish responses to online and offline surveys. The survey used the official institutional layout and domain name to increase perceived reliability in the potential respondents. The research instrument was organized into three parts: 1) demographic

information about the teachers: gender, age, working status, years of working as a teacher; 2) items used as measures for the UTAUT constructs except use behavior; and 3) special items used as measures for use behavior constructs (see Appendix). The UTAUT measuring items were measured using a five-point Likert scale with answer choices ranging from *strongly disagree* (1) to *strongly agree* (5). Use behavior items used a similar scale, but the answer choices ranged from *never* (1) to *at least once a day* (5). Inspiration for the items was taken from similar studies on acceptance (Chang et al., 2012; Jairak et al., 2009; Tan, 2013), but with the wording modified to match the teaching context.

Participants and procedure

In order to select the study participants, desk research was conducted to identify all 17 higher education institutions that have a language center for university students, or institutions which offer the Modern Languages Bachelor degree course in Colombia. Subsequently, a formal email was sent to the coordinators of each program asking for permission to contact the professors and invite them to participate in the study. Whenever permission was granted, professors' institutional email was retrieved and saved. Professors were then emailed a formal invitation. The invitation and two reminders to participate were sent to 250 professors during the data collection period. After deletion of invalid and incomplete responses, the final sample consisted of 89 higher education language teachers, of which 47 were women (52.8%) and 42 men (47.2%). Their average age was 30 years old (SD=8) and their average years of language teaching experience was six (SD=6.5).

Data analysis

To examine whether the independent factors are significant predictors of teachers' use behavior of mobile apps for teaching, Partial Least Squares-based Structural Equation Modeling (PLS-SEM) was used. For the purposes of this study, PLS-SEM is appropriate given that a prediction model is proposed. In PLS-SEM the research model is evaluated in two stages. First, the measurement model is examined via construct reliability and reliability. Second, the structural model is analyzed by performing PLS-algorithms and bootstrapping. Given that the research model has five paths pointing toward the variable attitude, a minimum of 50 cases is required (Chin & Newsted, 1999). Accordingly, the sample size of this study meets this requirement. The analysis was performed in SmartPLS 3 (Ringle et al., 2015).

Results

The structural model

In order to test the hypotheses presented in Section 3, path analysis using PLS-SEM was performed using bootstrapping on 500 subsamples to examine the significance of

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two-tailed test statistics (t-values). The initial path modelling estimation shows that only performance expectancy (PE) is a positive determinant of attitude (ATT). In addition, attitude (ATT) and facilitating conditions (FC) are positive determinants of behavior intention (BI). Initial results are presented in Table 1.

Table 1. Initial structural model with all hypothesized paths included

Hypothesis	Path	Coefficients	T-statistics	p-value
Hypothesis 1	PE -> BI	0.086	0.909	0.364
Hypothesis 2	EE -> BI	0.041	0.370	0.711
Hypothesis 3	SI -> BI	0.206	1.803	0.072
Hypothesis 4a	FC -> ATT	0.147	1.337	0.182
Hypothesis 4b	FC -> UB	-0.143	1.408	0.160
Hypothesis 5	BI -> UB	-0.188	1.745	0.082
Hypothesis 6	PE -> ATT	0.576	5.595	0.000***
Hypothesis 7	EE -> ATT	0.063	0.579	0.563
Hypothesis 8	FC -> BI	0.195	1.979	0.048*
Hypothesis 9	ATT -> BI	0.358	3.090	0.002**

*p<.05, **p<.01, ***p<.001

Acronyms: attitude (ATT), effort expectancy (EE), facilitating conditions (FC), behavioral intention (BI), performance expectancy (PE), and social influence (SI)

Based on the initial findings, more parsimonious models, i.e. removing one non-significant path at a time, were run. These result in the final model which is presented in Figure 2. The detailed results are presented in Table 2.
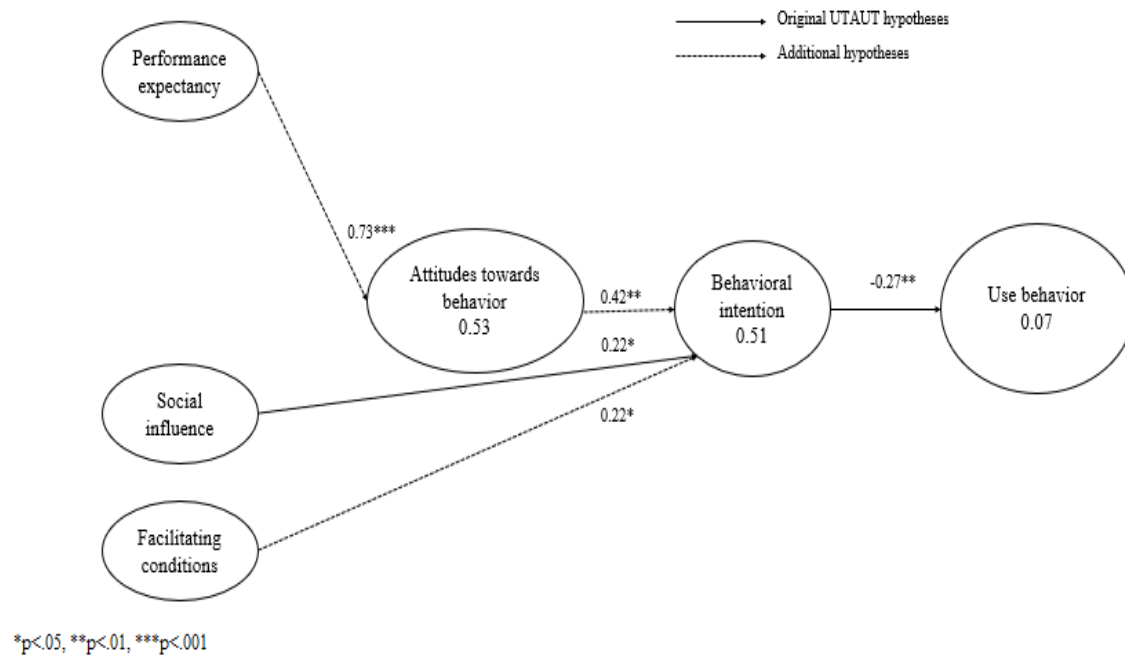
Figure 2. Structural model results

Table 2. Path analysis results

	Attitude towards behavior (R²=.56).			Behavioral intention (R²=0.51)			Use behavior (R²=.07)		
	b	t-statistic	p-values	b	t-statistic	p-values	b	t-statistic	p-values
Performance expectancy	0.731	10.455	0.000						
Social influence				0.226	2.075	0.039			
Attitude towards behavior				0.423	4.642	0.000			
Facilitating conditions				0.223	2.267	0.024			

Behavioral intention	-0.265	2.941	0.003

In summary, the findings revealed that performance expectancy has a direct significant effect (b=0.731, p=0.000) on attitude towards behavior (R^2=.55). There are three factors significantly predicting behavior intention; namely, social influence (b=0.226, p=0.039), attitude towards behavior (b=0.423, p=0.000), and facilitating conditions (b=0.223, p=0.024). Altogether, they accounted for an R^2=.51. Finally, and unexpectedly, behavior intention (b=-0.265, p=0.003) has a significantly negative effect on use behavior (R^2=.07). However, the effect size calculated (R^2 /1- R^2 = 0.075<0.1) according to Cohen (1992), displays a small effect of behavior intention on use behavior.

Descriptive analysis

Table 3 shows the descriptive statistics for the UTAUT-based survey constructs. The respondents on average strongly? agreed with the statements in the survey. The highest average scores were for attitude and performance expectancy, which means the teachers have a positive attitude towards using MALL and they think it can increase the effectiveness of foreign language learning.

Table 3. Means and standard deviations of the scales

Variables	M	SD
Attitude	4.19	0.74
Performance expectancy	4.09	0.67
Effort expectancy	3.76	0.60
Facilitating conditions	3.58	0.78
Behavioral intention	3.47	1.09
Social influence	3.36	0.76

Descriptive statistics for use behavior

In order to determine to what extent mobile devices are used for teaching, teachers were asked how frequently they use different mobile app categories (see Table 4). The answers 'never', 'at least yearly', 'at least monthly', 'at least weekly' and 'at least daily', were respectively coded as 0, 1, 12, 52 and 365 days per year. Summing up frequencies over all app categories, indicates that 90% of the surveyed teachers report daily use of apps for language teaching. 94% of surveyed teachers reported weekly usage.

Table 4. Descriptive statistics for use behavior*

	Mean use days per year	SD	Median
Radio and music applications	193.84	180.55	365
Language course apps	190.85	171.89	52
Games	144.95	171.10	32
Video chat	137.74	168.06	12
Common phrases	134.40	170.30	12
Voice apps	120.67	162.66	12
Language phrases apps	119.38	163.28	12
Verb applications	114.23	162.09	12
News and magazines	99.81	157.00	12
Vocabulary applications	97.37	153.83	12
Translators	85.57	150.17	1
Social networks	74.45	140.60	0
Instant messaging applications	70.52	141.95	0
Dictionaries	24.05	85.63	0
Video apps	20.86	77.12	0

* How often do you use the following app categories for foreign language teaching? Report only smartphone or tablet use.

The results from Table 4 reveal that Colombian university teachers generally use a range of mobile applications for foreign language teaching. However, the high standard deviation also indicates that usage frequency varies considerably among teachers. Radio and music applications and language course apps are the preferred MALL tools for teachers. Conversely, video apps and dictionaries are the least explored application categories.

Instrument Validation

Measurement model

In order to evaluate the measurement model, two rules of thumb are applied. For convergent validity, the AVE should be at least .50 (Fornell & Larcker, 1981) and the factor loadings should be from .700. Regarding discriminant validity, the square root of AVE of each construct should be larger than the correlation of the specific construct with any of the other constructs in the model (Chin & Newsted 1999). Furthermore, the constructs should display a composite reliability (CR) higher than 0.7.

According to the analysis and based on previous research (García et al., 2018), we have combined items EE2, EE3, EE4, and EE5 into EE8 to reflect effort expectancy in the teaching of the four English skills (speaking, listening, reading, and writing). In addition, items EE6 and EE7 have been reverted into EE9 to result in one single item for the use of hardware and software for language teaching. Next, items FC2 and FC6 have been parceled to reflect one dimension of connectivity. In addition, the item SI4 displayed lower loading (<.600) and thus was not included in further analysis. Table 5 displays the factor loadings of attitude (ATT), effort expectancy (EE), facilitating conditions (FC), behavioral intention (BI), performance expectancy (PE), and social influence (SI). Table 6 further presents the composite reliability and the average variance extracted (AVE) in which all values meet the cut-off values of .700 and 0.5, respectively.

Table 5. Factor loadings of the items measuring the latent constructs

	ATT	EE	FC	BI	PE	SI
ATT1	0.878					
ATT2	0.892					
ATT3	0.869					
ATT4	0.840					
ATT5	0.707					
EE1		0.829				
EE8		0.819				

EE9	0.687				
FC3		0.715			
FC4		0.712			
FC5		0.737			
FC7		0.793			
BI1			0.942		
BI2			0.972		
BI3			0.946		
PE1				0.851	
PE2				0.803	
PE3				0.726	
PE4				0.855	
PE5				0.861	
SI1					0.840
SI2					0.889
SI3					0.750

Acronyms: attitude (ATT), effort expectancy (EE), facilitating conditions (FC), behavioral intention (BI), performance expectancy (PE), and social influence (SI).

Table 6. Composite reliability and average variance extracted

Latent variables	Composite reliability	Average Variance Extracted (AVE)
Attitude (ATT)	0.923	0.706
Effort expectancy (EE)	0.826	0.619
Facilitating conditions (FC)	0.808	0.584
Behavioral Intention (BI)	0.968	0.909
Performance expectancy (PE)	0.911	0.673
Social influence (SI)	0.865	0.681

The discriminant validity of each construct was confirmed in Table 7, which shows that the square roots of the AVEs (in the diagonal line) of each latent construct are greater than the correlations among them.

Table 7. Discriminant validity of the constructs

	ATT	BI	EE	PE	SI	UB	FC
ATT	**0.840**						
BI	0.639	**0.953**					
EE	0.497	0.462	**0.787**				
PE	0.730	0.579	0.551	**0.820**			
SI	0.470	0.520	0.424	0.520	**0.825**		
UB	-0.156	-0.265	-0.096	-0.090	-0.203	**1.000**	
FC	0.520	0.537	0.559	0.525	0.426	-0.244	0.764

Acronyms: attitude (ATT), effort expectancy (EE), facilitating conditions (FC), behavioral intention (BI), performance expectancy (PE), social influence (SI) and use behavior (UB).

DISCUSSION

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Given that teachers play a key role in students' adoption of technology (Dashtestani, 2016; Stockwell, 2010), the present study analyzes Colombian higher education language teachers' acceptance of MALL according to the UTAUT. As such, the study presents an assessment of dimensions affecting behavioral intentions and a measurement of teachers' actual use of MALL.

Regarding the implementation of the UTAUT, the study highlights its positive contribution as a technology acceptance instrument due to its strength and applicability (Ling et al., 2011). Following previous literature, (Jairak et al., 2009; Moran et al., 2010; Šumak & Šorgo, 2016; T. D. Thomas et al., 2013), this study extended the UTAUT to include attitude to further highlight variables related to human and social change processes which are missing in other acceptance models such as the TAM[1] (Legris et al., 2003).

As for the assessment of dimensions, the SEM analysis revealed several significant relations. The dimensions that affect behavioral intentions towards MALL use are attitude, social influence and facilitating conditions. Surprisingly, teachers who scarcely use MALL show stronger intentions to use it compared to teachers with high MALL use, resulting in a negative correlation between behavioral intention and use behavior. Despite this relationship, the study does support previous literature

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[1] Extending the UTAUT with attitude improved the explained variance for behavioral intention in the model. The original determinants of intention explained 45% of variance whereas the inclusion of attitude increased the explanatory power of the UTAUT to 50%.

documenting the positive views of teachers towards mobile learning (see Dashtestani, 2012; Oz, 2014).

In the resulting model, attitude is the most determinant variable on behavioral intention (see also Cheon et al., 2012; Huang & Liaw, 2005). Accordingly, the study echoes that teachers' positive attitudes influence the effective implementation of MALL in their teaching, (see also Goad, 2012). Teachers' positive attitude is in turn influenced by their performance expectancy of using MALL, meaning that teachers need to be aware of how mobile devices and apps can improve their language teaching and the language learning of their students. To achieve this, breakthroughs in MALL should be communicated swiftly to the teaching community. Because not all teachers have access to or are aware of the scientific publications on MALL, it is important that good practices are communicated through alternative dissemination channels including all other mainstream communication channels available (e.g., blogs, social networks, video platforms). This effective knowledge transfer is vital since not knowing about the benefits of mobile learning is one of the most important barriers to its implementation. This is very much the situation in the Colombian higher education context (Estrada Villa, 2018).

According to the study outcomes, social influence further nurtures teachers' behavioral intention towards MALL. Therefore, peer knowledge and advice on mobile learning remain a cornerstone for adoption (see Aubusson et al., 2009). Social influence can be carried out effectively by promoting professional learning communities and communities of practice for mobile learning (see Schuck et al., 2013). As students have a substantial influence on teachers' adoption of mobile learning in the Colombian higher education context (Estrada Villa, 2018), student input on MALL should be embraced, especially because Colombian higher education students are already using MALL for their learning experience (García et al., 2018, 2019). Teachers' interactions with other educational stakeholders enable a refinement of practices towards effective MALL integration. Therefore, a mobile pedagogy framework should tackle questions about mobile learning activities. Some of these include: How do activities lead to improving learning proficiency and outcomes? How do they make the most of circumstances and resources to enable further practice? How do they relate to ever-changing contexts of language use? How do they ensure reflection on learning? (Kukulska-Hulme et al., 2015).

An additional determinant for behavioral intention is considering the facilitating conditions in place to favor MALL implementation. Whereas teachers in this study are generally positive about the technical infrastructure available to them to employ MALL, there is a lack of organizational structure to carry out mobile learning in the Colombian higher education context (see Estrada Villa, 2018). Therefore, there needs to be clarity about national mobile learning policies in higher education. Policies in favor of mobile learning would encourage teachers' support from the institutions and it would frame the role of mobile devices in educational areas such as curriculum development, evaluation, and informal learning. In addition, improvements to current conditions for MALL implementation via public funding or

private/public initiatives would raise interest in MALL from the teacher community. This interest should be backed by professional development since Colombian higher education teachers report a need for greater guidance regarding mobile learning (Estrada Villa, 2018).

The analysis of the use behavior items reveals that, despite the potential need for professional development, many teachers are already applying their knowledge of mobile technologies to language teaching and learning (see also Baran, 2014; Hsu, 2016). The results show that teachers preferably use radio and music applications. As this is the feature Colombian language learners use most in their self-access experience with technology (British Council, 2015), radio and music applications can trigger fruitful synergies between teachers and students. Conversely, results show that teachers use language course apps[2] with relatively high frequency, but students in the same context make little use of them (García et al., 2018, 2019). Furthermore, other applications that have a particularly significant use frequency by Colombian language learning students such as dictionaries, translators, instant messaging applications, social networks, and videos (García et al., 2018, 2019) are the least used by teachers in the same context. Whereas frequency use differences can be explained by the differing roles of teachers and students, teachers are underusing application categories which could be beneficial for learning. Research shows that the use of instant messaging applications, social networks and video applications promote authenticity, content creation and meaningful learning (see Al-Shehri, 2011; Andujar, 2016; Gromik, 2012; Hazaea & Alzubi, 2016; Kim et al., 2013). Aspects that hinder mobile learning implementation in the Colombian higher education context such as lack of training, lack of proper infrastructure, lack of appropriate technical and institutional support (Estrada Villa, 2018) could play a role in the limited use of these kinds of applications. Video applications being the least used category could be due to mobile internet bandwidth challenges in Colombia, as perceived by teachers. This limited usage by Colombian teachers contrasts with the extensive use of video for foreign language learning by Colombian students in the same context (García et al., 2018, 2019).

The negative correlation of behavioral intention with use behavior

If it is considered logical that the more teachers use their mobile device in their instruction, the more positive perception they have about its usefulness (O'Bannon & Thomas, 2015), why is there a negative correlation between behavioral intention and use behavior in this study? While other studies already hint at a weak? relationship between behavioral intention and use behavior (Wu & Du, 2012), the intention-behavior consistency or inconsistency might further be attributed to the types of participants.

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[2] These kind of applications are intended to be stand-alone solutions. In turn, stand-alone implies that all language instruction is provided by the technology used (Grgurović et al., 2013).

By looking at the decomposition of intention-behavior depending on participants by Sheeran (2002), some study participants can be profiled as *inclined abstainers* or *disinclined actors*. The former refers to participants with positive intentions who fail to act accordingly, whilst the latter is attributed to participants who perform the behavior despite less positive intentions to do so. Since the two groups of participants do not act according to their intentions, it cannot be asserted that they have a behavioral tendency (habit) towards MALL despite its current use. Reasons for this might be found in mediating factors not fully assessed in the model such as teaching beliefs, self-efficacy, motivations, or time shortage.

More particularly, participants might be inclined abstainers of MALL because they procrastinate in MALL implementation or because MALL does not entirely fit the institution's existing practices. It is also likely that, despite a positive attitude towards MALL, teachers still believe it is distracting to use mobile devices in class, as is the case with mobile learning use by Colombian teachers in higher education (see Estrada Villa, 2018). Likewise, disinclined acting might come as a result of student pressure on mobile learning implementation (Estrada Villa, 2018) which can be time-consuming and cause information overload, as can be the case when teachers use social media (see Gruzd et al., 2012).

LIMITATIONS

Despite the relevance of the outcomes presented, there are limitations which readers of this study should bear in mind. First, the study has a cross-sectional/non-experimental nature. Hence, it provides a predominantly descriptive view of acceptance and usage that was not manipulated by the researchers. A repeated-measures study would have provided a broader understanding of acceptance over time, particularly because perceptions change as individuals gain experience (Venkatesh et al., 2003). Second, while 89 participating language teachers from 17 higher education institutions is reasonably representative for the sector in Colombia, the sample size remains too small for the study to impute relationships with greater accuracy. Third, items for some constructs could be improved in order to avoid item merging towards an improved validity score. Fourth, caution should be taken regarding the discussion on use behavior. Use behavior was measured via indirect techniques (self-reporting) and thus reliability could be contested in terms of the extent to which teachers correctly remembered and reported their usage frequency. Fifth, the validity of the use behavior scale (to what extent the items really measure use behavior) can equally be contested. We surveyed the usage frequency of 15 mobile application categories, and, in hindsight, we would have also asked teachers to report their usage frequency of *any* mobile application for language teaching. As such, we could have avoided estimating the total usage by totalling the usage of the 15 categories. Nevertheless, there is a lack of consensus on how use behavior should be best measured (see Agudo-Peregrina et al., 2014).

CONCLUSION

The current study contributes to the understanding of MALL acceptance and usage by higher education teachers in Colombia. The Unified Theory of Acceptance and Use of Technology (UTAUT) was extended with the additional variable of attitude. Results indicate that the model indicators which have an impact on behavioral intention are attitude, social influence and facilitating conditions. The study also measured actual technology usage, which is commonly neglected in technology acceptance models. The resulting negative correlation between behavioral intention and technology usage is a warning that technology acceptance studies should not overlook the measurement of usage.

The outcomes of the study suggest that Colombian teachers are employing MALL for instruction because they believe MALL contributes to more effective learning. Radio and music applications as well as language course apps are the MALL features most frequently used by teachers.

Nevertheless, effective MALL integration into teaching practices could be accelerated by further actions from educational stakeholders. First, there should be swift communication about the potential of MALL in order to increase positive attitudes in the teaching community. Second, peer knowledge and communities of best practice should be encouraged. These communities should consider students' expertise with MALL because students have an influence on teachers' use of mobile learning in Colombia. Third, facilitating conditions could be improved by developing clear policies about mobile learning and an organizational structure that permits and encourages MALL. Given that there may be teachers with intentions of using MALL but who somehow cannot translate that into usage and then teachers who implement MALL despite intentions to use it less, professional development regarding MALL seems necessary. There is no doubt that the new dynamics currently being experienced worldwide will change the way in which the educational stakeholders perceive and use MALL. Thus, there is a call for the institutionalization of a conceptual framework that recognizes the importance of mobile learning and specifically MALL as a core element of pedagogical practices.

REFERENCES

Abu-Al-Aish, A., & Love, S. (2013). Factors influencing students' acceptance of m-learning: An investigation in higher education. *The International Review of Research in Open and Distributed Learning*, *14*(5), 82-107. https://doi.org/10.19173/irrodl.v14i5.1631.

Agudo-Peregrina, Á.F., Hernández-García, Á., & Pascual-Miguel, F.J. (2014). Behavioral intention, use behavior and the acceptance of electronic learning systems: Differences between higher education and lifelong learning. *Computers in Human Behavior*, *34*, 301-314. https://doi.org/10.1016/j.chb.2013.10.035.

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Al-Shehri, S. (2011, October). Context in our pockets: Mobile phones and social networking as tools of contextualizing language learning. In *Proceedings 10th World Conference on Mobile and Contextual Learning (mLearn)* (pp. 278-286).

Andujar, A. (2016). Benefits of mobile instant messaging to develop ESL writing. *System*, *62*, 63-76. https://doi.org/10.1016/j.system.2016.07.004.

Aubusson, P., Schuck, S., & Burden, K. (2009). Mobile learning for teacher professional learning: benefits, obstacles and issues. *Research in Learning Technology*, *17*(3), 233-247. https://doi.org/10.3402/rlt.v17i3.10879.

Baran, E. (2014). A Review of Research on Mobile Learning in Teacher Education. *Educational Technology & Society*, *17*(4), 17-32. https://www.jstor.org/stable/jeductechsoci.17.4.17.

Begum, R. (2011). Prospect for cell phones as instructional tools in the EFL classroom: A case study of Jahangirnagar University, Bangladesh. *English Language Teaching*, *4*(1), 105-115. https://doi.org/10.5539/elt.v4n1p105.

British Council. (2015). *English in Colombia: An examination of policy, perceptions and influencing factors*. https://bit.ly/3njj3aG.

Burston, J. (2013). Mobile-assisted language learning: A selected annotated bibliography of implementation studies 1994–2012. *Language Learning & Technology*, *17*(3), 157-225. https://www.lltjournal.org/item/2830.

Chang, C., Yan, C., & Tseng, J. (2012). Perceived convenience in an extended technology acceptance model: Mobile technology and English learning for college students. *Australasian Journal of Educational Technology*, *28*(5), 809-826. https://doi.org/10.14742/ajet.818.

Cheon, J., Lee, S., Crooks, S.M., & Song, J. (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. *Computers & Education*, *59*(3), 1054-1064. https://doi.org/10.1016/j.compedu.2012.04.015.

Chin, W.W., & Newsted, P.R. (1999). Structural equation modeling analysis with small samples using partial least squares. In R.H. Hoyle (Ed.), *Statistical strategies for small sample research* (pp. 307-341). SAGE Publications.

Dashtestani, R. (2012). Barriers to the implementation of CALL in EFL courses: Iranian EFL teachers' attitudes and perspectives. *The JALT CALL Journal*, *8*(2), 55-70. https://doi.org/10.29140/jaltcall.v8n2.134.

Dashtestani, R. (2016). Moving bravely towards mobile learning: Iranian students' use of mobile devices for learning English as a foreign language. *Computer Assisted Language Learning*, *29*(4), 815-832. https://doi.org/10.1080/09588221.2015.1069360.

Duman, G., Orhon, G., & Gedik, N. (2015). Research trends in mobile assisted language learning from 2000 to 2012. *ReCALL*, *27*(2), 197-216. https://doi.org/10.1017/S0958344014000287.

El-Hussein, M.O.M., & Cronje, J.C. (2010). Defining Mobile Learning in the Higher Education Landscape. *Educational Technology & Society*, *13*(3), 12-21. https://bit.ly/2VocPel.

Estrada Villa, E. (Comp.). (2018). *El M-Learning en la Educación Superior en Colombia: Un caso de aplicación.* Escuela de Postgrados de la Fuerza Aérea Colombiana. https://doi.org/10.18667/9789585996151.

Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Addison-Wesley.

Fornell, C., & Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39-50. https://doi.org/10.1177/002224378101800104.

García, G., Questier, F., Cincinnato, S., He, T., Zhu, C. (2018). Acceptance and usage of mobile assisted language learning by higher education students. *J Comput High Educ*, *30*, 426–451. https://doi.org/10.1007/s12528-018-9177-1.

García, G., Questier, F., & Zhu. (2019) Self-directed language learning in a mobile-assisted, out-of-class context: Do students walk the talk? *Computer Assisted Language Learning*, *32*(1-2), 71-97. https://doi.org/10.1080/09588221.2018.1485707.

Goad, K. (2012). *The perception of teachers toward the use of mobile technology as a tool to engage students in learning* [Doctoral dissertation, Indiana State University]. Sycamore Scholars. http://hdl.handle.net/10484/4004.

Godwin-Jones, R. (2011). Emerging technologies: Mobile apps for language learning. *Language Learning & Technology*, *15*(2), 2-11. http://hdl.handle.net/10125/44244.

Grgurović, M., Chapelle, C.A., & Shelley, M.C. (2013). A meta-analysis of effectiveness studies on computer technology-supported language learning. *ReCALL*, *25*(2), 165-198. https://doi.org/10.1017/S0958344013000013.

Gromik, N.A. (2012). Cell phone video recording feature as a language learning tool: A case study. *Computers & education*, *58*(1), 223-230. https://doi.org/10.1016/j.compedu.2011.06.013.

Gruzd, A., Staves, K., & Wilk, A. (2012). Connected scholars: Examining the role of social media in research practices of faculty using the UTAUT model. *Computers in Human Behavior*, *28*(6), 2340-2350. https://doi.org/10.1016/j.chb.2012.07.004.

Hazaea, A., & Alzubi, A. (2016). The effectiveness of using mobile on EFL learners' reading practices in Narjan University. *English Language Teaching*, *9*(5), 8-21. https://doi.org/10.5539/elt.v9n5p8.

Hernández, R., Fernández, C., & Baptista, P. (2014). *Metodología de la investigación* (6ª ed.). McGraw-Hill.

Hsu, L. (2016). Examining EFL teachers' technological pedagogical content knowledge and the adoption of mobile-assisted language learning: A partial least square approach. *Computer Assisted Language Learning*, *29*(8), 1287-1297. https://doi.org/10.1080/09588221.2016.1278024.

Huang, H.M., & Liaw, S.S. (2005). Exploring users' attitudes and intentions toward the web as a survey tool. *Computers in Human Behavior*, *21*(5), 729-43. https://doi.org/10.1016/j.chb.2004.02.020.

Iqbal, S., & Qureshi, I. (2012). M-learning adoption: A perspective from a developing country. *International Review of Research in Open and Distance Learning*, *13*(3), 147-164. https://doi.org/10.19173/irrodl.v13i3.1152.

87

Jairak, K., Praneetpolgrang, P., & Mekhabunchakij, K. (2009). An acceptance of mobile learning for higher education students in Thailand. *IJCIM*, *8*(SP3), 361-368. https://bit.ly/3k0rDtb.

Jara, I., Claro, M., & Martinic, R. (2012). *Mobile learning for teachers in Latin America: Exploring the potential of mobile technologies to support teachers and improve practice*. United Nations, Educational, Scientific & Cultural Organization.

Jung, H.J. (2015). Fostering an English Teaching Environment: Factors Influencing English as a Foreign Language Teachers' Adoption of Mobile Learning. *Informatics in Education*, *14*(2), 219-241. https://doi.org/10.15388/infedu.2015.13.

Kearney, M., & Maher, D. (2013). Mobile learning in maths teacher education: Using iPads to support pre-service teachers' professional development. *Australian Educational Computing*, *27*(3), 76-84. https://www.learntechlib.org/p/133321/.

Kim, D., Rueckert, D., Kim, D.J., & Seo, D. (2013). Students' perceptions and experiences of mobile learning. *Language Learning & Technology*, *17*(3), 52-73. http://hdl.handle.net/10125/44339.

Kraut, R. (Ed.). (2013). *Policy guidelines for mobile learning*. United Nations, Educational, Scientific & Cultural Organization.

Kukulska-Hulme, A. (2009). Will mobile learning change language learning? *ReCALL*, *21*(2), 157-165. https://doi.org/10.1017/S0958344009000202.

Kukulska-Hulme, A., Norris, L., & Donohue, J. (2015). *Mobile pedagogy for English language teaching: A guide for teachers*. British Council.

Laouris, Y., & Eteokleous, N. (2005). We need an educationally relevant definition of mobile learning. In *Proceedings of mLearn*. https://bit.ly/3EfYand.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information and Management*, *40*(3), 191-204. https://doi.org/10.1016/S0378-7206(01)00143-4.

Lenhart, A. (2012). *Teens, smartphones and texting*. Pew Research Center. https://www.pewresearch.org/internet/2012/03/19/teens-smartphones-texting.

Ling, L.W., Downe, A.G., Ahmad, W.F.W., & Lai, T.T. (2011, September). *Determinants of computer usage among educators: A comparison between the UTAUT and TAM models*. National Postgraduate Conference. https://doi.org/10.1109/NatPC.2011.6136322.

Mac Callum, K. (2010, July). *Attitudes of educators to the introduction of mobile technology*. 1st annual conference of Computing and Information Technology Research and Education New Zealand.

Mac Callum, K., & Jeffrey, L. (2013). The influence of students' ICT skills and their adoption of mobile learning. *Australasian Journal of Educational Technology*, *29*(3), 303-314. https://doi.org/10.14742/ajet.298.

Mac Callum, K., Jeffrey, L., & Kinshuk. (2014). Factors impacting teachers' adoption of mobile learning. *Journal of Information Technology Education: Research*, *13*, 141-162. https://doi.org/10.28945/1970.

Marchewka, J.T., & Kostiwa, K. (2007). An application of the UTAUT model for understanding student perceptions using course management software.

Communications of the IIMA, *7*(2), 93-104. https://scholarworks.lib.csusb.edu/ciima/vol7/iss2/10.

Moran, M., Hawkes, M., & El Gayar, O. E. (2010). Tablet personal computer integration in higher education: Applying the unified theory of acceptance and use technology model to understand supporting factors. *Journal of Educational Computing Research*, *42*(1), 79-101. https://doi.org/10.2190/EC.42.1.d.

Morchid, N. (2019). The Determinants of Use and Acceptance of Mobile Assisted Language Learning: The Case of EFL Students in Morocco. *Arab World English Journal*, Special Issue on CALL (5), 76–97. https://doi.org/10.24093/awej/call5.7.

Morchid, N. (2020). Mobile Assisted Language Learning: Evidence of an Emerging Paradigm. *International Journal of English Literature and Social Sciences*, *5*(1), 148–156. https://doi.org/10.22161/ijels.51.30.

Nichols, M. (2008). Institutional perspectives: The challenges of e-learning diffusion. *British Journal of Educational Technology*, *39*(4), 598-609. https://doi.org/10.1111/j.1467-8535.2007.00761.x.

Nistor, N., & Heymann, J.O. (2010). Reconsidering the role of attitude in the TAM: An answer to Teo (2009a). *British Journal of Educational Technology*, *41*(6), E142–E145. https://doi.org/10.1111/j.1467-8535.2010.01109.x.

O'Bannon, B.W., & Thomas, K.M. (2015). Mobile phones in the classroom: Preservice teachers answer the call. *Computers & Education*, *85*, 110-122. https://doi.org/10.1016/j.compedu.2015.02.010.

Oz, H. (2014). Prospective English teachers' ownership and usage of mobile devices as m-learning tools. *Procedia-Social and Behavioral Sciences*, *141*, 1031-1041. https://doi.org/10.1016/j.sbspro.2014.05.173.

Pegrum, M. (2014). *Mobile learning: Languages, literacies and cultures*. Springer.

Ringle, C.M., Wende, S., & Becker, J.M. (2015). *SmartPLS 3*. SmartPLS. http://www.smartpls.com.

Şad, S.N., & Göktaş, Ö. (2014). Preservice teachers' perceptions about using mobile phones and laptops in education as mobile learning tools. *British Journal of Educational Technology*, *45*(4), 606-618. https://doi.org/10.1111/bjet.12064.

Sánchez-Prieto, J.C., Olmos-Migueláñez, S., & García-Peñalvo, F.J. (2016). Informal tools in formal contexts: Development of a model to assess the acceptance of mobile technologies among teachers. *Computers in Human Behavior*, *55*, 519-528. https://doi.org/10.1016/j.chb.2015.07.002.

Schuck, S., Aubusson, P., Kearney, M., & Burden, K. (2013). Mobilising teacher education: A study of a professional learning community. *Teacher Development*, *17*(1), 1–18. https://doi.org/10.1080/13664530.2012.752671.

Sharples, M. (2000). The design of personal mobile technologies for lifelong learning. *Computers & Education*, *34*(3-4), 177-193. https://doi.org/10.1016/s0360-1315(99)00044-5.

Sharples, M. (2006). *Big issues in mobile learning*. University of Nottingham.

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Sheeran, P. (2002). Intention—behavior relations: A conceptual and empirical review. *European review of social psychology*, *12*(1), 1-36. https://doi.org/10.1080/14792772143000003.

Soleimani, E., Ismail, K., & Mustaffa, R. (2014). The acceptance of mobile assisted language learning (MALL) among post graduate ESL students in UKM. *Procedia-Social and Behavioral Sciences*, *118*, 457-462. https://doi.org/10.1016/j.sbspro.2014.02.062.

Stockwell, G. (2010). Using Mobile Phones for Vocabulary Activities: Examining the Effect of the Platform. *Language Learning & Technology, 14*(2), 95-110. https://doi.org/10125/44216.

Sung, Y.T., Chang, K.E., & Yang, J.M. (2015). How effective are mobile devices for language learning? A meta-analysis. *Educational Research Review, 16*, 68-84. https://doi.org/10.1016/j.edurev.2015.09.001.

Šumak, B., & Šorgo, A. (2016). The acceptance and use of interactive whiteboards among teachers: Differences in UTAUT determinants between pre-and post-adopters. Computers in Human Behavior, *64*, 602-620. https://doi.org/10.1016/j.chb.2016.07.037.

Tai, Y. (2012). Contextualizing a MALL: Practice Design and Evaluation. *Educational Technology & Society*, *15*(2), 220-230.

Tan, P.J.B. (2013). Applying the UTAUT to Understand Factors Affecting the Use of English E-Learning Websites in Taiwan. *SAGE Open*, *3*(4), 1–12. https://doi.org/10.1177/2158244013503837.

Thomas, K.M., O'Bannon, B.W., & Bolton, N. (2013). Cell phones in the classroom: Teachers' perspectives of inclusion, benefits, and barriers. *Computers in the Schools*, *30*(4), 295–308. https://doi.org/10.1080/07380569.2013.844637.

Thomas, T.D., Singh, L., & Gaffar, K. (2013). The utility of the UTAUT model in explaining mobile learning adoption in higher education in Guyana. *International Journal of Education and Development using Information and Communication Technology*, *9*(3), 71-87. https://www.learntechlib.org/p/130274/.

Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, *27*(3), 425-478. https://doi.org/10.2307/30036540.

Viberg, O., & Grönlund, Å. (2013). Systematising the field of mobile assisted language learning. *International Journal of Mobile and Blended Learning*, *5*(4), 72-90. https://doi.org/10.4018/ijmbl.2013100105.

Wang, Y.S., Wu, M.C., & Wang, H.Y. (2009). Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British Journal of Educational Technology*, *40*(1), 92-118. https://doi.org/10.1111/j.1467-8535.2007.00809.x.

Wu, J., & Du, H. (2012). Toward a better understanding of behavioral intention and system usage constructs. *European Journal of Information Systems*, *21*(6), 680–698. https://doi.org/10.1057/ejis.2012.15.

APPENDIX

Item	Question
	Performance expectancy (Chang et al., 2012)
PE1	The usage of smartphones or tablets could enable foreign language learning more quickly
PE2	The usage of smartphones or tablets could improve foreign language skills
PE3	The usage of Mobile apps could improve students' academic performance in foreign language courses.
PE4	The usage of smartphones or tablets could increase the effectiveness of foreign language learning
PE5	I find smartphones or tablets useful in foreign language learning
	Effort expectancy (Chang et al., 2012)
EE1	A smartphone or tablet to teach foreign languages could be easy for me to use
EE2	I would find it easy to teach foreign language listening with a smartphone or tablet
EE3	I would find it easy to teach foreign language speaking with a smartphone or a tablet
EE4	I would find it easy to teach foreign language reading with a smartphone or a tablet
EE5	I would find it easy to teach foreign language writing with a smartphone or a tablet
EE6	I think It could be easy for me to find and use mobile apps for foreign language teaching
EE7	I think it is easy to learn to operate a smartphone or a tablet
	Social influence (Jairak et al., 2009)
SI1	People who influence my behavior think that I should use a smartphone or a tablet to teach foreign languages
SI2	People who are important to me think that I should use a smartphone or a tablet to teach foreign languages
SI3	I think that university teachers are supportive of the usage of a smartphone or a tablet to teach foreign languages
SI4	I think that students are positive about the usage of a smartphone or a tablet to teach foreign languages
	Facilitating conditions (Jairak et al., 2009; Tan, 2013)
FC1	I have easy access to a smartphone or a tablet
FC2	I can have easy and regular access to internet (through wifi or data plan) on a Smartphone or a tablet to teach foreign languages

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FC3	I could find apps to teach foreign languages on a smartphone or a tablet
FC4	I have the knowledge necessary to use smartphones or tablets to teach foreign languages
FC5	I can find support if I experience problems with a smartphone or tablet while teaching foreign languages
FC6	I know a convenient place where I could use wifi with a smartphone or tablet to teach foreign languages

Behavioral intention (Jairak et al., 2009)

BI1	I intend to use a smartphone or tablet to teach foreign languages in the near future.
BI2	I predict I will use a smartphone or a tablet to teach foreign languages in the near future
BI3	I have a plan to use a smartphone or a tablet to teach foreign languages in the near future

Attitudes towards behavior (T. D. Thomas et al., 2013)

ATT1	Using smartphones or tablets to teach foreign languages is a good idea
ATT2	I would like to use a smartphone or tablet to teach foreign languages
ATT3	I think that teaching foreign languages with a smartphone or tablet is fun
ATT4	I think using smartphones or tablets to teach foreign languages inside the classroom is a good idea
ATT5	I think using smartphones or tablets to teach a foreign language outside the classroom is a good idea

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