A REVIEW OF INTEGRATING MOBILE PHONES FOR LANGUAGE LEARNING

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ABSTRACT

Mobile learning (m-learning) is gradually being introduced in language classrooms. All forms of mobile technology represent portability with smarter features. Studies have proven the concomitant role of technology beneficial for language learning. Various features in the technology have been exploited and researched for acquiring and learning languages. This paper presents a review of empirical studies on the integration of mobile phones in language learning contexts published from 2004 to 2013, a total of ten years. Studies on m-learning for languages were located and retrieved using Google Scholar and library databases. Thirty-three (33) studies were analysed using Nvivo software. The main findings include: (a) Japan as the country which contributed the most studies employing mobile phones; (b) tertiary learners are the most prolific participants of studies; (c) vocabulary is the most popular language area learnt on mobile phones; and (d) quantitative is the most popular research design chosen. The list of the studies is not exhaustive and comprehensive; but it supports the potential of integrating mobile phones as a learning tool to enhance language learning.

KEYWORDS

m-learning, mobile technology, mobile phone, language learning

1. INTRODUCTION

Rapid advances in information and communication technology (ICT) have produced a wide range of mobile technologies, which "are rapidly attracting new users, providing increasing capacity, and allowing more sophisticated use" (Viberg and Gronlund 2012). Society has readily accepted mobile technology and integrated it into their lives (Ally 2007). Learners, as the end users of knowledge, have experienced the developing educational trend, and the expansion of mobile technology has attracted language instructors to integrate the technology for learning languages. The main objective of the integration is to support the learning process using mobile technologies that imply mobility, portability, and personalized learning (Naismith, Lonsdale et al. 2004, Begum 2011). This paper offers an overview of published studies on language learning using mobile phones to reveal the effects of mobile phones on various language skills and other language learning aspects by examining the pedagogies adopted using the mobile phones for language learning.

2. MOBILE TECHNOLOGY, MOBILE DEVICES, MOBILE PHONE

The use of mobile technology in education offers new learning experiences and flexibility in learning – learning anywhere and anytime – with increased opportunities for decisions to be made by the learners. Furthermore, mobile technology offers ubiquitous and immediate access to information as well as saving resources. The introduction of mobile technology for learning has given rise to the term 'mobile learning', which is often abbreviated to 'm-learning'. Examples of definitions of m-learning quoted by the authors in this field include learning mediated via handheld devices that are potentially available anytime, anywhere for either formal or informal learning (Kukulska-Hulme and Shield 2008); seeking knowledge through conversations across multiple contexts among people and personal interactive technologies (Sharples, Taylor et al. 2007); as well as learning and getting information on handheld or palmtop devices as the sole or

dominant technologies (Traxler 2005). For the purpose of this paper, mobile technology is defined as any forms of devices which are portable for learners to use for learning and getting information and "carries the idea of e-learning a step further by adapting its content to handheld devices" (Crescente and Doris 2011). In other words, integrating mobile devices in learning will encourage engagement and collaboration among learners and between language instructors.

Mobile devices denote technology that is portable and personal. The devices are portable as they are light; whilst personal as they are usually not shared with others and are being kept close to the owner. The technology includes "mobile phones, smartphones, personal digital assistants (PDAs) and their peripherals such as tablet PCs abd laptop PCs" (Traxler, 2005). Ogata et al. (2010) agree that the technology refers to "lightweight devices such as PDA, cellular mobile phones, and so on" (p. 8). The features of the technology extend opportunities for frequent engagement for learning regardless of connection to the Internet. The increasing number of studies being published in the past ten (10) years indicates the growing interest in mobile technology in the field of education.

The earlier designs of mobile phones (depending on context also known as cell phones, hand phones or cellular phones) were bulky and heavy devices that were used to make and receive calls only. As the technology develops, the sizes have become smaller and the weight has become lighter, representing increased portability. Nevertheless, the general features on mobile phones still include Internet-access capability, voice-messaging, short message service (SMS) text messaging, photographs, and audio/video recording (Chinnery 2006, Levy 2009) besides the communicative and computational capabilities allowing responses to user requests for connecting people or for managing personal information (Chao and Chen 2009). More recent models are known as smart phones and have smart features enabling communicative language practice for language learning as well as giving access to authentic content and task completion (Chinnery, 2006). Smart phones have computer-like functions allowing browsing and downloading of contents (Cui and Wang, 2008) in addition to free or inexpensive applications for smart phones (Kukulska-Hulme et al., 2011) and usually they have bigger screen size. Therefore, mobile technology is believed to be able to extend learning opportunities in a meaningful way (Thornton and Houser 2005) as learners determine and engage in actvities that motivate their personal learning needs and circumstances of use (Kukulska-Hulme et al., 2007, Pettit and Kukulska-Hulme, 2007).

The sense of personal belonging as well as the intimacy of the mobile phones to learners attracted earlier researchers to study the potential of mobile phones in education in general, and for language learning, specifically. The purpose of this review is to collate empirical research studies that employed mobile phones as the technology for language learning. Researchers have employed other types of mobile technology in education but this review is confined to providing baseline information on studies integrating mobile phones. Studies dated from 2004 to 2013 were reviewed in order to understand the progressive developments in the use of mobile phones to learn languages. The first author located relevant studies and collated information in relation to the progress including about the countries most prolific in integrating mobile phones for language learning, groups of participants selected in the research studies, as well as the "methodological, theoretical and linguistics knowledge trends" (Viberg and Gronlund 2012). However, there has been a gradual movement toward integrating mobile technologies into teaching and learning and Kukulska-Hulme and Shield (2008) claimed that it was due to educators who wished to understand how the technologies could be effectively used to support various kinds of learning. Their claim explains the result that found only nine (9) studies on language learning integrating mobile phones prior to 2008. Nevertheless, the number of studies increased by 83% till 2013 as more researchers developed interest in conducting similar studies.

3. METHODOLOGY

Published studies were retrieved from Google Scholar and library databases, namely Taylor & Francis, Sage Journals Online, ERIC, Springer Link. The searched keywords included mobile phone, cell phone, hand phone, handheld, mobile technology, mobile assisted language learning, mobile language learning, m-learning, language learning, English language learning, second language learning, second language acquisition, and foreign language learning. The search was limited to 2004 - 2013, inclusive, a total of 10 years. Only studies that integrated mobile phones or combined mobile phones with other learning resources for language learning were selected and a total of 50 studies was obtained.

The selection of studies was further refined to empirical studies only leaving 33 studies which were exported from the Endnote library as a .XML file for import into NVivo software, version 10 (2012), a program to analyse qualitative data. Next, the themes were determined prior to the coding by creating a Node classification. The first author coded the content of each article according to year of publication, level of participants, countries that initiated the studies, language skills and language areas learnt using mobile phone, research design adopted by the researchers and finally, research gaps highlighted by authors of the studies. Each article was read reflectively to identify content relevant to the pre-determined themes which were then highlighted and coded to the relevant node.

4. DISCUSSION

In general, the reviewed studies demonstrate the technical capabilities of mobile phones for language learning. Studies on the integration of mobile phones unanimously agree that these new learning tools are not to replace teachers or to replace the earlier forms of technology for learning (Kukulska-Hulme 2009). The mobile phones are designed to complement and support existing learning technologies for use in the learning process (Prensky 2005). The benefits include effectiveness to deliver language learning materials (Thornton and Houser 2005) and enable learning collaboration to achieve learning goals (Pena-Bandalaria 2007). This paper analyses the various approaches to integrating mobile phones to enhance language learning so as to enhance understanding of the learning practices of language learners.

4.1 Publication

Figure 1 shows the number of published studies on the integration of mobile phones for language learning that were obtained from Google Scholar and Library databases according to years. Although the number was only 2 in 2004, as shown by the trend line the number gradually increased, peaking in 2011. The graph shows no related studies identified in 2006. In 2013, there are 2 studies that have been published at the time of reporting. The gradual increase is believed to reflect an increase in interest by researchers taking the initiative to learn the new technology as well as identifying the feasible language skills or areas appropriate to use with the technology. In spite of the readiness of language teachers to adopt mobile phones for learning, learners moved faster in using the technology to support their learning process (Traxler 2005).

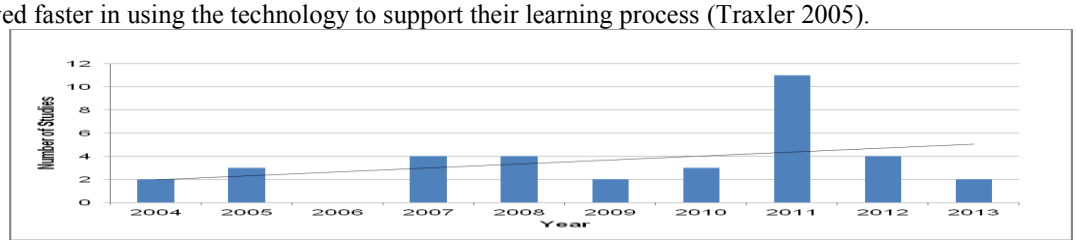

Figure 1. Trend in mobile phone for language learning research publications 2004 - 2013

4.2 Country of Studies

Studies employing mobile phones for language learning have been done across the globe from Australia to the United Kingdom. The most productive country in terms of studies published is Japan – a total of 10 studies. The least in the list with one study include Bangladesh, Canada, Hong Kong, and the Netherlands (see Figure 2).

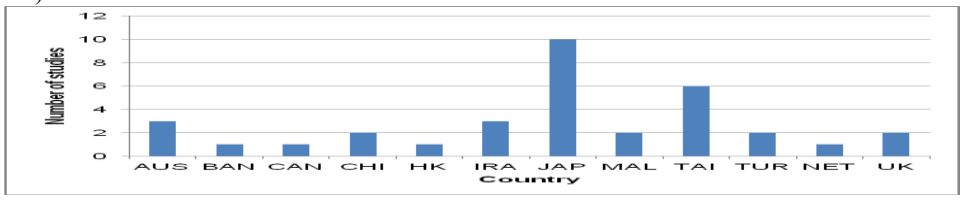

Figure 2. Countries conducted studies on mobile phones for language learning

4.3 Educational Level of Participants

The participants for the published studies have been varied. As shown in Table 1 a few studies were conducted on primary or secondary school learners. Thirty (30) of them were carried out on tertiary learners. Participants in others were employees and migrants who were selected to learn English language informally.

Table 1. Educational levels of mobile language learning research participants

Year	Author	Lower	High	Tertiary	Others
2013	Hayati et al			✓	
	Stockwell, G.			✓	
2012	Saran et al.			✓	
	Tabatabaei & Goojani			✓	
2011	Begum, R			✓	
	Edge et al.			✓	
	Gabarre et al.			✓	
	Gromik, N.			✓	
	Hsu & Lee				Employees
	Huang & Lin			✓	
	Pearson, L.				Migrants
	Sandberg et al.	✓			
	Taki & Khazaei			✓	
	Yamada et al.				Employees
	Zhang et al.			✓	
2010	Gabarre et al.			✓	
	Gromik & Anderson			✓	
	Stockwell, G.			✓	
2009	Cavus & Ibrahim			✓	
	Gromik, N			✓	
2008	Chen et al.			✓	
	Kennedy & Levy			✓	
	Lu, M.		✓		
	Stockwell, G.			✓	
2007	Ally et al.			✓	
	Cooney & Keogh			✓	
	Fallahkhair et al.			✓	
	Stockwell, G.			✓	
2005	Levy & Kennedy			✓	
	Song and Fox			✓	Adults
	Thornton & Houser			✓	
2004	Kiernan & Aizawa			✓	
	Thornton & Houser			✓	

4.4 Language Skills and Language Areas

The first author classified the learning objective for using the mobile phone in each study as either language skills or language areas. The former includes listening, speaking, reading, and writing; whilst the latter includes vocabulary, idioms, and grammar. As shown in Table 2, the majority of the studies were devoted to vocabulary learning as the most frequently selected language skill with a total of 18 studies. For example, Stockwell (2013) conducted a study combining vocabulary learning with listening skills using mobile phones. Vocabulary is the basic building blocks of the target language before developing sentences. Second language learners learn vocabulary for them to be able to deliver using chunks of words with simple meanings. The early design of mobile devices that had limited physical and technical functions were appropriate to deliver vocabulary content.

The next most popular language skill reported in the studies was speaking, with a total of 7 studies. Kukulska-Hulme (2008) raised concern at the rare studies of mobile phone use to develop oral interaction though the technology has the affordance, and prior to 2008 only one study (Cooney and Keogh, 2007) was conducted on speaking skills. Other studies focused on English for specific purposes, for instance, English for tourism (Hsu, 2012), idioms (Thornton and Houser 2004, Hayati, Jalilifar et al. 2013), grammar (Ally, McGreal et al. 2007, Kennedy and Levy 2008, Gabarre and Gabarre 2010) and prepositions (Begum 2011).

The early designs of mobile technologies had small screen size limiting the presentation of graphics (Albers and Kim, 2001); nevertheless, Colpaert (2004) raised his concern on the output from the mobile

phones as focusing more on the visual aspects instead of verbal aspects. Many past studies required learners to read from the screen of mobile phones rather than listening to audio from the mobile phones. This, according to Colpaert (2004), was a disadvantage for language learning. In addition to vocabulary learning, mobile phones were integrated in language learning using the Short Message System (SMS) feature to deliver content knowledge (Lu 2008, Cavus and Ibrahim 2009).

Based on this review it can be concluded that the integration of mobile phones for language learning was not used on its own only but on a few occasions the technology had also been incorporated with other learning resources with the objective of enhancing learning. Similarly, each of the learning skills was either individually learnt on the mobile phone or the specific language skills were learnt together with other language areas. In general, the aim is still to support the planning and managing of learning strategies and activities.

Table 2. List of language skills and language areas

		Language skills					Language
Year	Author	L	S	R	W	V	areas
2013	Hayati et al						Idioms
	Stockwell, G.	✓	✓			✓	
2012	Saran et al					✓	
	Tabatabaei & Goojani					✓	
2011	Begum, R						Preposition
	Edge et al.		✓				
	Gabarre et al.						
	Gromik, N		✓				
	Hsu & Lee						ESP
	Huang & Lin			✓			
	Pearson, L.						English
	Sandberg et al.						ESL
	Taki & Khazaei					✓	
	Yamada et al.	✓					
	Zhang et al					✓	
2010	Gabarre et al.		✓				Grammar
	Gromik & Anderson		✓				
	Stockwell, G.					✓	
2009	Cavus & Ibrahim					✓	SMS
	Gromik, N		✓				
2008	Chen et al					✓	
	Kennedy & Levy					✓	Grammar
	Lu, M.					✓	SMS
	Stockwell, G.					✓	
2007	Ally et al.						Grammar
	Cooney & Keogh		✓				
	Fallahkhair et al.			✓		✓	
	Stockwell, G.					✓	
2005	Levy & Kennedy					✓	Italian
	Song and Fox					✓	
	Thornton & Houser					✓	Idioms
2004	Kiernan & Aizawa					✓	Task-based
	Thornton & Houser					✓	

4.5 Research Design

The options for research procedures include quantitative, qualitative, or mixed methods. Surveys are one of the instruments used to collect numerical data, interviews are examples of narrative data, whilst combining both survey and interview is the basis for mixed methods designs offering reliable results for more complex contexts. The design chosen for any particular research has a rationale based on the objectives of the research. With reference to Table 3, the most popular research design for the 33 studies was quantitative. In other words, pre-test in the form of survey in relation to specific language skills was administered at the beginning of the study and post-test was administered after the treatment of using mobile phone during the course of learning. None of these studies adopted qualitative research designs which future researchers can consider in order to gain additional insights into the context of discussion.

Table 3. List of research design

Year	Author	Qualitative	Quantitative	Mixed-methods
2013	Hayati et al.		✓	
	Stockwell, G.		✓	
2012	Saran et al.		✓	
	Tabatabaei & Goojani		✓	
2011	Begum, R.			✓
	Edge et al.			✓
	Gabarre et al.			✓
	Gromik, N.			✓
	Hsu & Lee		✓	
	Huang & Lin		✓	
	Pearson, L.			✓
	Sandberg et al.		✓	
	Taki & Khazaei		✓	
	Yamada et al.		✓	✓
	Zhang et al.		✓	
2010	Gabarre et al.		✓	✓
	Gromik & Anderson		✓	
	Stockwell, G.		✓	
2009	Cavus & Ibrahim		✓	
	Gromik, N.			
2008	Chen et al.			✓
	Kennedy & Levy		✓	
	Lu, M.			✓
	Stockwell, G.		✓	
2007	Ally et al.		✓	
	Cooney & Keogh			
	Fallahkhair et al.			✓
	Stockwell, G.			✓
2005	Levy & Kennedy			✓
	Song and Fox			✓
	Thornton & Houser		✓	
2004	Kiernan & Aizawa			✓
	Thornton & Houser		✓	

4.6 Future Research Directions

The following section presents future research areas suggested by authors of the past studies. First, empirical studies on the interaction of text literacy and standard English literacy have been few among them (Geng 2013) despite the assumption that tertiary learners have achieved a proficient level of academic literacy in reading and writing. With the assumption that different learning strategies will be adopted in m-learning contexts with the technology in hand, Geng (2013) suggested the need to study attitudes of learners when using text messages in m-learning and how their attitudes influence their practice. Similarly, Stockwell (2013) proposed future research on the engagement of learners in m-learning outside the classrooms since m-learning offers flexibility in learning. It is believed that mobile phones can be leveraged to support formal and informal learning.

Due to inconsistent findings by earlier studies on SMS, Hayati et al. (2013) proposed more studies using SMS in formal language learning; similarly Begum (2011) recommended further exploration and more empirical studies on the effectiveness of SMS for learning language. Nevertheless, past studies on SMS should be referred to identity the similarities and differences of the research context.

A feature in mobile phones is video recording and Thornton and Houser (2004, 2005) raised the issue of the least frequent activity using the video recording feature. Much later, Gabarre and Gabarre (2010) and Gabarre et al. (2011) addressed this issue by administering a study on a group of French language learners. However, the benefits of learning by integrating both audio and video features in mobile phones are of future interest (Gromik 2011, Saran, Seferoglu et al. 2012).

Social interaction promotes learning; consequently learning with peers reduces the emotional burden. In line with m-learning, a small number of studies have included the element of collaborative activities (Kukulska-Hulme and Shield 2008). Therefore, more studies on ways to use mobile phones in collaborative learning are encouraged (Clough, Jones et al. 2008).

A formal theory of mobile language learning is yet to be developed according to Joseph and Uther (2006) and Kukulska-Hulme (2008) even though Sharples et al. (2007) postulated a general theory of mobile learning. In addition, Lu (2008) suggested a study on an effective self-study approach to learn vocabulary among vocational high school students based on review of past studies. Similarly, Gromik (2010) highlighted the need for more studies on using mobile phones as a learning tool in general. Lan (20047) proposed studies using mobile phones to develop reading skills; however, based on the search for this review, only two studies were conducted (Huang and Lin 2011, Geng 2013). This can be attributed to the screen size of the earlier designs of mobile phones in contrast to the current designs, which have larger screen size that are more convenient for reading. Only two studies were conducted on listening skills since (Yamada, Kitamura et al. 2011, Stockwell 2013) and none for writing skills. In relation to writing, writing words or short phrases should be easier than writing long sentences using the restricted keyboards on mobile phones.

5. CONCLUSION

To summarise, this paper has reviewed studies using mobile phones in language learning contexts. The mobile phones are accepted by learners of second language learning and past studies have substantiated their integration to improve language skills and related language areas. Learning can take place in formal or informal settings allowing learners to learn at their own time and anywhere. With recent design and features of mobile phones, future studies on improving the language skills are recommended. Other potential areas of research include learning strategies, learner attitude and collaborative learning. Mobile phone is only a learning tool to aid language learning; therefore, future studies should also examine its integration in second language acquisition theories.

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