RESEARCH PAPER

A review of MALL: from categories to implementation. The case of Apple's iPad

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Abstract

The use of mobile devices inside and outside formal settings is often associated with innovative practices in the design of language learning activities. This often implies the reconceptualization of language learning tasks and of the role of the teacher in the mobile classroom. In order to investigate current research and practices in secondary and higher education a review of recent studies in the field of MALL has been undertaken with the main aim of identifying main trends, implementation practices and research gaps.

This paper presents a synthesis of the literature by analysing the four different MALL categories, as presented in Pegrum (2014) and selecting a series of case studies and trends that may be implemented in various educational settings with a specific focus on the use of the iPad in second language settings. The review sought to provide a picture of the various options of MALL task-design and recent implementation practices in secondary and higher education using a specific tablet device. General findings show that many studies are more descriptive than innovative and advocate the implementation of larger and long-term research studies on how mobile devices, and the iPad in particular, are impacting language teaching and learning. Keywords: Mobile-assisted language learning, review, iPAD, task design.

1. Introduction

Mobile technologies have many advantages and great potential in affecting and supporting second language learning. These technologies offer an increasingly broad range of devices, such as smartphones, tablets and new generation laptops, implemented by different companies and supporting different operating systems. The rationale behind this review paper is to present theories and studies published in English in the last ten years that examined the use and effectiveness of mobile technologies (specifically tablets and smartphones) and their potential in enhancing language teaching and learning, narrowing the focus on the use of the iPad. The choice of selecting studies specifically oriented to the use of the iOS devices comes from the awareness that different mobile devices (e.g. smartphones, tablets, laptops) have different affordances. The paper looks at current practices and methodologies by presenting single case studies implemented in secondary and higher education. The main aim was to examine the case studies to find valuable intakes to guide future research and practices and to find similar characteristics among iPad focus studies. The paper is broadly divided into four sections: an overview of Mobile Assisted Language Learning categories; recent review studies on the use of the MALL in formal and informal settings; the iPad in language learning contexts and as an

inclusive device. The choice of selecting studies specifically designed for iOS devices, such as the iPad, arises from the attempt to find specific features in the various devices and operating systems on the market.

2. Mobile Assisted Language Learning (MALL): the four categories

The term mobile technology is already known in the field of CALL (Computer Assisted Language Learning) (Burston, 2013), but today it goes beyond portable computers such as mobile personal laptops. According to the seminal work of Pegrum (2014) on the use of mobile devices for languages, literacies and cultures, it is possible to identify different kinds of MALL. In 2009, Garrett (2009) had already applied three different categories to CALL: tutorial CALL, authentic materials-engagement CALL and communication CALL. Pegrum (2014) applied these categories to MALL reorganising them and adding a new one. Following 'a scale of rising (inter)-activity' (Pegrum, 2014 p.94) the categories are: MALL for content, MALL for tutorial, MALL for creation and MALL for communication. The direction of Pegrum's categories clearly moves from a behaviourist approach (content consumption) to a sociocultural approach (content creation and communication). It should be considered that the more mobile devices are integrated in the language classroom the more 'socioculturally informed activities' are possible. In a classroom with a lower level of MALL, content consumption activities (e.g. reading or listening texts) would be the easiest approach to technology enhanced learning and it would start to provide students with autonomous learning activities (e.g. students can listen or read at their own pace). In the tutorial MALL classroom, learners can use different apps to perform a controlled or semi-controlled language task (e.g. podcasts with audio drilling or flashcards). Both MALL for content and MALL for tutorials offer the learners the chance to practise language competences in a low-stress mode since they do not require complex technological skills and the activities are often familiar and similar to those in language books. On the other hand, MALL for creation and MALL for communication require high interactivity of learners with their peers and with the mobile device itself. Moreover, teachers play a key role in the latter two because they provide feedback and support learners in the construction of meaning and knowledge. In creation MALL, students record their texts, take pictures and modify them according to the task, interact with the teachers through specific writing apps, etc. They are actively involved in more sociocultural activities such as collaboration, negotiation of meaning and sharing. Ideally the products created by students in MALL for creation can be shared with peers, teachers, friends and even a wider audience. Many studies in MALL, in fact, show the recent trend to investigate the use of social media in language learning (Mompean & Fouz-Gonález, 2016). In MALL for communication the shift is on the interactive process of activities like reading and writing. Learners can, for example, read collaboratively the same e-books, or write synchronously and asynchronously using sharing services such as Twitter or Instagram.

The studies presented here reflect the wide varieties of MALL uses mainly in the language classroom, although mobile devices allow learners to practise also outside formal settings. Content and tutorial activities, for example, can be moved outside the language classroom allowing the teacher to work on more interactive tasks where support and feedback are required in the classroom.

3. MALL studies in formal and informal learning: attitudes and skills

The use of mobile devices has influenced and is still influencing educational practices and, most importantly, it is creating innovative settings for learning (Pachler et al., 2010). A few studies using various mobile learning devices (smartphones, tablets and laptops) in the fields of science (Lan & Huang, 2012) , language courses (Hsu, Hwang, & Chang, 2013) , and ICT (Sabah, 2016) suggested that students participate actively in their learning, develop strong collaborative skills, and are able to direct their own learning process.

In their recent review of the developments and implications of MALL studies, Liu et al. (2014) found that 'whenever a new mobile technology is introduced, its effect on language teaching and learning is a popular topic for researchers' (2014, p. 165). Also Hung and Zhang (2012) had already observed the same growing interest in the field of mobile learning in language education in their review of mobile learning studies published between 2003 and 2008. Both studies include a wide range of mobile devices such as smartphones, tablets, Personal Digital Assistants (PDAs) and laptops. These studies indicate the large potential of informal language learning to support formal language activities, showing a need to investigate the interconnection between formal and informal MALL.

In this regard, recent studies have shown that when mobile technologies (smartphones) are integrated effectively in the language classroom, they provide a valuable contribution to the learning approaches, also creating a collaborative learning environment (Sabah, 2016). As such, the literature on mobile technologies for language learning reports a number of case studies that investigate various aspects and various devices of mobile language learning in formal education (Abdous et al., 2009; Hsu, 2013; Kukulska-Hulme, 2012; Viberg & Grönlund, 2012). In their review of mobile learning, Viberg and Grönlund (2012) observe that the dominating research focus is on the attitudes of learners towards technologies, their intention to use them, and the various uses of mobile technology for authentic communication integrated in their second and foreign language learning. Moreover, most of the recent studies in the field have sustained the idea that mobile technologies can contribute significantly to learners' second and foreign language acquisition in terms of enhancing grammar and vocabulary with smartphones (Çakmak & Erçetin, 2018; Liu, 2016), and developing writing, listening and speaking skills using tablets and smartphones (Chang & Hsu, 2011; Moreno & Vermeulen, 2015; Lin, 2014) . Furthermore, a systematic review of MALL studies published from 2008 to 2013 (Liu, Lu, & Lai, 2014) presents evidence of the distribution of learners and language skills (see Figure 1). The review article investigates a total of 24 m-learning articles using the task model for m-learning (Taylor, 2006) in order to identify trends and practices in MALL. Most of the studies examined were conducted with elementary or higher education learners, the mobile devices tested where mainly tablets and smartphones, while reading skills and vocabulary learning proved to be the most investigated areas in language learning.

Year	Levels of learners			
	Elementary school students	High school students	Higher education	Non-specified
2008	0	1	7	0
2009	0	0	2	0
2010	3	0	2	1
2011	2	0	2	0
2012	2	0	2	0
2013	1[a]	0	0	0
Total	8	1	15	1

Year	Types of language skills					
	Listening	Speaking	Reading	Writing	Grammar	Vocabulary
2008	1	0	2	0	1	7
2009	1	1	1	0	0	0
2010	2	1	2	1	0	6
2011	2	1	1	0	0	1
2012	2	1	2	2	0	1
2013	0	0	1	0	0	1
Total	8	4	9	3	1	16

Figure 1. Distribution of mobile learners and language skills (from Liu et al, 2014:176).

Based on a study with 45 students from eight different regions and countries in an EFL curriculum with an activity-oriented design, Hsu (2013) found that learners with different cultural backgrounds had varying attitudes towards MALL in terms of technological affordances, applicability and constructivist aspects (e.g. collaborative tasks). However, it was not possible to establish the exact reasons for their different experiences and expectations. According to the survey data, many students did not believe they could practice all language skills in a mobile learning setting, but they may not have had the opportunities to see how it could be effectively done. The review does not take into consideration the difference between the type of mobile devices used in the studies.

Likewise, one of the latest studies observed the attitudes of 345 higher education students in Sweden and China (Viberg & Gronlund, 2013). The researchers found that learners had particularly positive attitudes toward the chance to personalize their learning, the opportunity to have a valid learning experience, and the occasion to exchange information and collaborate with other students, and teachers. The study conducted by Hsu (2013) presents different attitudes of learners towards technology (smartphones) due to their cultural background; and further, Viber & Gronlund (2013) confirm that positive attitudes towards mobile devices can have an important impact in the language classroom. This implies that the context where the studies are carried out necessarily influences the design and implementation of m-learning in language settings. However, one of the studies mentioned above (Hsu, 2013) is quite small, and does not provide clear evidence of learner perceptions and mobile language learning, although it does give an idea of learners' perceptions of smartphones in the language classroom, especially in terms of real communication, personalization of learning, and multimodality (Kukulska-Hulme, 2013).

As stated above, many research studies have focused on the descriptive analysis of language teaching applications to develop specific skills, and in particular on listening, speaking and reading skills. For instance, Chang and Hsu (2011) analysed the use of mobile devices (PDAs) in an intensive reading course with intermediate EFL learners, including the attitudes and satisfaction levels of the users. One of the main ideas of the study was to integrate collaborative learning into reading activities on a mobile assisted language system by analysing the usage of the system by individual students and by groups of learners. Perceptions and satisfaction around the use of mobile devices were measured using the Technology Acceptance Model (TAM) questionnaire that addresses usefulness and the perceived ease-of-use (Park, Nam, & Cha, 2012). Their study found that the collaborative method gave a meaningful contribution to supporting EFL learners in reading comprehension. Interestingly, students grouped in twos, threes and fours performed better than individual students, but also better than groups of five learners.

This implies that collaborative activities performed through mobile technologies, specifically PDAs, can foster language learning in small groups. Moreover, learners liked the mobile device, and they thought it was useful and easy to use to read and annotate texts. However, Chang and Hsu (2011) observed that in addition to enhancing reading comprehension, forthcoming studies should also consider investigating listening, speaking and writing proficiency functions.

The studies presented here offered an overview of the main directions of MALL research considering various types of mobile devices. The following sections will focus on MALL studies designed and implemented using only iOS devices.

4. The case of the iPad in language learning

Language learning is one of the disciplines that could derive many benefits from the use of mobile technologies (Kukulska-Hulme, 2006). Since its first launch onto the market in 2010, the iPad has been implemented in various educational settings. There are several features that often influenced the choice of the Apple device: the screen size (three options available) that resembles the textbook page; the long-lasting battery, the lightweight, the access to a dedicated education App store, a single control button and an on screen keyboard (Albadry, 2017). In the classroom, tablets, such as the iPad, for example, allow learners to record themselves and to listen to audio at any point of the language lesson. Students can be invited to perform authentic interactions, collaborating and creating on their tablet devices. They are also easily exposed to a wide range of authentic materials, which strongly support the integration of language learning with everyday communication needs (Morgana, 2014). The iPad was the first tablet device to provide educators with various working configurations (e.g. with the help of various apps they can provide immediate and personalized feedback to students during lessons or flip the class by projecting any student's work on the screen) and enable learners to perform a wide variety of tasks (Gabarre, Gabarre, Din, Shah, & Karim, 2014).

4.1. Learners' and teachers' perceptions

A group of studies on the use of the iPad in the language classroom focused on learners' and teachers' perceptions (e.g., Gabarre et al., 2014; Wang, Teng, & Chen, 2015). For example, Gabarre et al. (2014), explored how iPads can be used in the language classroom to promote active learning opportunities as in Lys (2013) and Chen (2013). They implemented a qualitative research design in the form of a case study in order to have more detailed insights and understandings of the processes. The study involved one French learner in a Malaysian university. Their findings show that the learner felt comfortable using the iPad in the classroom; she mentioned many ways to use it for educational purposes (YouTube videos, dictionary, immediate search for accurate information on a topic etc.); she did not like to use it for writing activities. Similarly, Wang et al. (2015) observed the implementation of the iPad to support EFL vocabulary acquisition with 74 students in a Taiwanese university. The study provided quantitative and qualitative analysis comparing two data groups and a pre-test/post-test design. The participants were divided into two groups: the experimental group using the vocabulary app on the iPad, and the pen and paper group using the traditional semantic map provided by the teacher to learn vocabulary. Findings show that the experimental group performed better in the post-test. Gabarre et al. (2014) showed that the iPad promoted new and active language learning opportunities, while Wang et al. (2015) implemented a larger study,

demonstrating how an iPad app contributed to significant progress in learners' vocabulary acquisition. This implies that, based on the few studies carried out so far, learners' attitudes towards the iPad in the language classroom are positive, and teachers should be encouraged to implement a technological-mediated task design in their classroom. However, there is a lack of details and explanations of the tasks implemented in both studies. In addition, the results cannot be considered conclusive as they are mostly based on data taken from university students, or small-scale studies (e.g., one student).

4.2. iPads in secondary schools

Although the distribution of iPads in secondary schools is rapidly increasing, especially in the United States (as reported by Bloomberg Business in October 2013 and by an Apple company self-report on iPads in education in 2017), large-scale studies on the iPad in secondary classrooms are still scarce. However, there are a few studies of this nature. For instance, Chou, Block and Jesness (2012) ran a four-month pilot project of one-to-one learning with iPads in four 9 th grade classrooms in a large K-12 school district in the United States. They collected the data using three data sources: teacher focus groups, student focus group and classroom observation. The researchers compared notes and collected the main themes which emerged from the data collection (e.g., active engagement, increased time for projects, enhanced teaching with updated information). Their findings showed the positive impact of iPad integration especially in terms of motivation, time management, and digital literacy (digital literacy here means those 'skills to effectively decode and encode meaning in digital channels' as in Pegrum 2014, p. 158). The study also interestingly shows the need to have well-prepared teachers in the classroom, confirming one of the issues raised in various studies that mobile learning activities are not effective if teachers are not comfortable with the technologies being used.

There are a number of studies focusing on the use of the iPad in the English as foreign language secondary classroom (e.g., Lin, 2014; Morgana & Shrestha, 2018; Simpson, Walsh, & Rowsell, 2013). Lin (2014), for example, investigated the effects of using iPads in an Extensive Reading Program on teenage English learners' online activities, reading ability and users' perceptions. Two classes and an English teacher were selected in a senior high school in Taiwan; the study lasted ten weeks; one class was assigned to the mobile group reading on iPads and the other, the PC group, reading on PCs. The researcher triangulated data through the users' learning records, the reading texts, and the Technology Acceptance Model questionnaire. Results showed how the mobile group outperformed the PC group and provided empirical evidence for mobile integration in extensive reading programmes in secondary EFL education.

5. The iPad and the development of speaking skills

We are all aware that the Internet and mobile apps offer a variety of opportunities for language learning listening and speaking practice. Learners can listen to authentic materials (e.g., radio and TV channels, audiobooks), and they can also practice the language through chatting (e.g., Face Time, Skype) or recording their voices (e.g., podcast). Some of these media have recently been investigated as supportive tools for second language learning using iOS devices (Abdous et al., 2009; Ducate & Lomicka, 2009; Gromik, 2012; Lord, 2008; Lys, 2013; Papadima-Sophocleous & Charalambous, 2015; Pegrum, 2014).

Lys (2013) conducted an interesting study in an advanced German class, investigating the integration of the iPad into the classroom and its influence on learners' oral language development. The author particularly focused on how an instructional setting that provides additional conversational opportunities in and outside the classroom with a mobile device (iPad) could impact the quality of students' oral language proficiency. The study was a one-to-one iPad implementation project, and it was part of a larger study at a private American university; it lasted nine weeks, involving 13 students. They were engaged in a variety of speaking, listening and recording tasks. Each week they worked on a scaffolded task, had a real time video chat using Face Time and they had to provide an open-ended recorded speech. Results showed that real-time conversational activities could contribute to advanced learners' speaking proficiency. Students had more time to speak compared to a standard non-iPad class, and they reported a high level of enthusiasm. Various aspects of the study presented by Lys (2013) are relevant for future research (e.g. use of scaffolded activities), although we should also bear in mind some important limitations: the lack of a pen and paper group, the difficulties of assessing speaking performance and the limited number of students involved.

Moreover, there are a number of studies that investigated the use of podcasting to improve students' pronunciation. Some of these found certain improvements (Lord, 2008), others did not (Ducate & Lomicka, 2009). In a study at the University of Cyprus learners used mobile devices (iPod Touch, iPad's brother device) to improve oral reading fluency (Papadima-Sophocleous & Charalambous, 2015). Students recorded themselves reading a text, after practising by following a native speaker model on YouTube. After a content analysis of the data produced by the learners, the researchers found a general improvement in speed and word decoding accuracy. This was probably due to the considerable amount of time that learners spent rehearsing with the mobile device.

The iPad, and mobile devices, in general can also provide unlimited opportunities for fluency-focused speaking production (Pegrum, 2014). For instance, in a study conducted in a Japanese university, students were asked to record a 30-second video on a teacher-selected topic (Gromik, 2012). The author triangulated the video/audio data produced by the students with survey data. Results demonstrated an increasing number of words used by students task after task, and students felt the activities proposed enhanced their oral fluency.

Although the studies presented above show positive results, and generally follow a well-designed approach with a coherent data analysis process, we can argue that some aspects (such as the limited number of students and teachers involved) could limit the reliability of their findings. Additionally, these studies do not provide innovative ideas that can support teachers in the use of mobile devices in the second language classroom. They provide a description of standard and general use of iPads. This shows the need for more research on a wider-ranging use of mobile devices, such as iPads, in MALL.

Despite a large number of studies focusing on the use of the iPad to develop speaking skills (Lys, 2013; Morgana, 2018), but also to enhance vocabulary (e.g. Wang et al., 2015), and reading (e.g. Lin, 2014), studies focusing on grammar learning, pronunciation and writing skills are less represented in the reviewed literature. No study so far has investigated the four skills at the same time (listening, speaking, reading and writing) in the EFL classroom.

6. The iPad as an inclusive m-learning tool

The use of the iPad has also been implemented in primary and secondary institutions globally as an accessible and inclusive m-learning tool (Aronin & Floyd, 2013; Cumming, Strnadova, & Singh, 2014; Flewitt, Kucirkova, & Messer, 2014; Hayhoe, 2013; King et al., 2013; Parsons, 2014; Selner, 2011) . A relevant study is the one conducted by Cumming, Strnadova, and Singh (2014) at a private high school in Sydney. The action research study investigated the process and the outcomes of the introduction of the iPad as an inclusive learning tool on teachers and students. The project focused on four students with developmental disabilities attending classes in inclusive settings and five special education teachers. The team of teachers and researchers had bi-weekly meetings to reflect on the practice, they collected students' written assignments, wrote articles on a shared webpage and recorded video interviews with teachers and students. Teachers evaluated learners' outcomes following an inquiry and knowledge building cycle (Timperley et al., 2007 cited in Cumming et al. 2014). They were asked to select learners' and teachers' needs, and based on the results, design tasks for the classroom; at the end of the cycle teachers reflected on the impact of the tasks on learning. Data consisted of interviews, notes from teachers' meetings and classroom observation tables, and they were analysed using an inductive content analysis approach. The study concluded that both students and teachers found the iPads to be motivating and effective tools for learning. In the English classroom in particular, the iPads were used for reading texts, viewing movies and, in general to reduce the time students took to read texts or novels. Although findings were consistent with other studies (e.g., Campigotto, McEwen, and Demmans Epp, 2013), the study has the limitation of being an unrepresentative sample: the sample was relatively small and specialized.

7. Conclusion

In general, the literature reviewed here shows that there is a further need to explore how the use of mobile devices, such as the iPad, can facilitate the development and acquisition of linguistic awareness and language skills, how instructors could engage learners equipped with mobile devices, and how second language tasks that would improve learners' experience could be designed (Ifenthaler & Schweinbenz, 2013). Based on the studies presented above it is possible to identify some of the main characteristics of the use of the iPad in secondary and higher education settings. Collaborative activities based on students' engagement and information sharing appeared to be easy to conduct and provided strong motivation, thus, confirming that the category of MALL for creation is a growing trend in the mobile classroom. Also, some studies demonstrated how the iOS device helped teachers to provide immediate and personalised feedback on the tasks proposed. For instance, teachers and students reported positively on the use of the built-in iPad messenger app to interact inside and outside the classroom (Morgana & Shrestha, 2018). Mobile devices can have similar characteristics and affordances, but the fact that learners and teachers use the same device with the same applications and the same operating system appeared to facilitate scaffolding, instruction flow and the management of various issues such as app selection or sharing features. One of the key aspects often reported in MALL studies is the need for teachers to have a good methodology background and to feel comfortable using the mobile device. All the studies presented above involving the use of the iPad as the only mobile device for the research project, showed a great involvement by the teachers and no issues related to this aspect were mentioned. Apparently, participants feel more comfortable and engaged when using the

same device (e.g. the iPad) compared to classrooms where different mobile devices with different operating systems have been selected. This choice also has an impact on task-design and implementation making it simpler for the teacher/researcher. Further research is needed in order to investigate the ways in which the use of specific mobile devices is impacting language learning with secondary school and higher education students. Moreover, none of the studies reviewed here looked at the changes in learners' behaviours throughout the implementation of mobile technologies. The present review also identified a few key areas that are underrepresented in the literature related to the use of iOS devices, in particular the lack of longitudinal and large-scale studies, and of studies focusing on grammar or on writing development using iPads. Generally, this review also reveals the need for replication studies in the field of MALL.

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