MOBILE-ASSISTED LANGUAGE LEARNING: STUDENT ATTITUDES TO USING SMARTPHONES TO LEARN ENGLISH VOCABULARY

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ABSTRACT

This project examines mobile-assisted language learning (MALL) and in particular the attitudes of undergraduate engineering students at the South Westphalia University of Applied Sciences towards the use of the smartphone app Quizlet to learn English vocabulary. Initial data on attitudes to learning languages and to the use of mobile devices to do so was gathered by questionnaire from a convenience sample of 68 students. The results indicated that almost all of the participants had a smartphone and were interested in using it in language learning. The vocabulary for the Professional English: Engineering exam was then made available to the students in the Quizlet app. At the end of the semester ten students took part in follow-up interviews. The vocabulary scores from the exams from the two latest semesters were compared and showed no significant difference in the student performance. The interviews however revealed that the students found the use of mobile-learning flashcards to be a very efficient, convenient and enjoyable learning method. This research concludes that the use of smartphones in language learning is beneficial in terms of student motivation and may have additional long-term benefits which have yet to be seen. Continued study on a larger scale over a longer period is therefore recommended to provide more insight into the optimal use of mobile-assisted language learning.

KEYWORDS

Mobile-assisted language learning, attitudes, vocabulary, flashcards, apps, quizlet.

1. INTRODUCTION

Computer-assisted language learning has been present in schools and universities for many years. With the development of new, powerful mobile phones more and more tasks which were previously confined to desktop PCs can be carried out on mobile devices. This includes functions relating to language learning, a field which has now become known as mobile-assisted language learning (or MALL).

1.1 Mobile-learning in Meschede

Mobile phones and smartphones have become ubiquitous amongst students of business and engineering degrees at South Westphalia University of Applied Sciences in Meschede (Davie, 2012). All of the sixty students surveyed in 2012 confirmed that they had at least one mobile phone or smartphone. Half of the surveyed group said they had already used their mobile devices to aid them in their learning despite the fact that the university did not officially offer any mobile learning opportunities. Furthermore, two-thirds of the students interviewed expressed a desire for the availability of official university mobile learning tools. These responses formed a basis to further explore the area of mobile learning and conduct a small-scale development project and study on the use of mobile devices in language learning.

2. BODY OF PAPER

Research by Saran et al. (2008), Lu (2008) and Kukulska-Hulme & Shield (2008) has shown that students are favourable to the use of mobile devices for learning vocabulary and studies have also shown positive results. However, Chinnery (2006) states that there is no decisive evidence that newer technologies are any better than existing ones and Beatty (2003) confirms that teachers have to think very carefully before investing time and money in new (and unproven) technologies. The rationale of this study is therefore an attempt to reconcile the fact that students seem keen to make use of mobile learning technologies whilst at the same time there is a lack of conclusive evidence about its value for learners. This study will attempt to discover whether mobile-assisted language learning techniques do indeed offer a benefit to learners. Particular attention will be given to the mastery of vocabulary as an area which students often label as monotonous to learn and which seems to lend itself to the opportunities and restrictions offered by mobile learning.

For the purposes of this paper a clear definition of mobile-assisted language learning is required. Valarmathi (2011) defines it simply as the use of a mobile device in support of the (language) learning experience. The devices involved could therefore be a personal digital assistant (PDA), a normal mobile phone (now also known as a "dumbphone"), a smartphone, a tablet computer or an mp3 player. Each of these devices offers a combination of unique affordances which all influence the way in which it can be used as an educational tool.

For Ally & Prieto-Blázquez (2014) it is important to emphasize the mobility of the learner who should remain at the centre of the learning, rather than the technology. The role of the technology is simply to allow the learner to learn, regardless of context. Kukulska-Hulme & Shield (2008) share this sentiment. For them, mobile-assisted language learning is "formal or informal learning mediated via handheld devices which are potentially available for use anytime, anywhere".

Wagner (2005) confirms that mobile phones are a natural choice for use in mobile learning as they have already been adopted by the majority of students. This means little training or support should be required. Studies have also shown that using a device that is owned by the student is more effective than using a borrowed device (Kukulska-Hulme, 2009). This all makes a bring-your-own-device (BYOD) approach possible, saving institutions costs in both financial and administrative terms.

Flashcards are a popular tool for learning vocabulary which also now has a smartphone equivalent. Azabdaftari & Mozaheb (2012) compared the success of using traditional, paper-based flashcards with using a smartphone app for digital flashcards. Digital flashcards have the advantages of supporting multimedia (e.g. audio files as well as text or pictures) and can also monitor and store the learner's progress. If the learner is trying to learn a large amount of vocabulary or various different lists a flashcard app can be more manageable than a stack of several hundred paper cards. In Azabdaftari & Mozaheb's study, at the Islamic Azad University in Iran, a group of 40 students used a flashcard app combined with SMS and internet dictionaries, whereas the control group of 40 students used traditional paper-based flashcards over a seven week period. A multiple-choice test was then used to evaluate the success of both strategies. Qualitative interviews were also conducted with 10 members of each group to assess the students' attitudes to the learning methods. The results showed that the mobile learning students performed significantly better than the control group.

Nevertheless it appears difficult to provide empirical evidence of mobile technologies improving students' subject skills. Many researchers have instead focused on the learners' attitude to mobile learning as a measure of its success (Kutluk & Gülmez, 2014; Jaradat, 2014). Kutluk and Gülmez (2014) explored accounting students' attitudes to the use of mobile technologies for learning. The 343 students who participated in the study had not yet officially used mobile devices in their accounting lessons but the majority had a positive attitude towards using m-learning and believed that using mobile technology for homework or research would be easy and quick.

Jaradat (2014) examined student attitudes and perceptions of the use of m-learning to learn French and attempted to measure changes to student performance before and after the use of mobile learning technologies. The 36 female students who took part in this study over two semesters made use of m-learning both inside and outside the classroom. Survey data collected on attitudes to learning French in both formal and informal settings and the use of mobile technologies was enhanced with the data from ten interviews conducted with randomly selected members of the group. The results of the survey revealed that 76% preferred to receive their French lessons by mobile phone rather than on a PC or in class. 90% said they were

satisfied with the use of m-learning and 91% said they wanted to continue using it to learn French. However, the pre-test, post-test analysis carried out by Jaradat did not show a large improvement in the students' learning. The students saw the use of mobile technologies as improving the communication within the class and between the class and teacher. The results suggest that in this case m-learning can be seen as an efficient tool, if not necessarily an effective one.

Lominé (2009) identified three factors which have to be considered when implementing an m-learning strategy – pedagogy, economics and technology. The pedagogy must be clear before any trials are begun. It is also paramount that this is the driving force rather than the technology. The economics is the area which seems to be neglected by many of these studies – how much will such a system cost both the lecturer and the students and is it more cost-effective than alternative technologies? As well as the financial cost, this could be a high physical and emotional cost for all involved if it is not researched thoroughly. Lastly, the technology has to be considered carefully. At our institution almost all students seem to have a mobile phone (if not a smartphone). This is however not always the case and in addition, as a very hilly area, there are some villages and areas which have very poor, or no, mobile phone reception which could greatly influence the effectiveness of such a study as well as the students' attitude to the value of the tool.

The nature of mobile learning must also not be forgotten. It is, as described by Kukulska-Hulme and Traxler (Beetham & Sharpe, 2007), spontaneous, opportunistic and informal. These factors mean that it may be difficult for the learner to concentrate on learning when surrounded by distractions which are not present in the usual classroom. It therefore seems that there are significant challenges in using mobile devices to teach aspects of English as a foreign language, such as vocabulary or grammar, but with consideration they can be overcome.

Although not all overridingly positive, the results of these studies seem to suggest that there is merit in pursuing mobile-assisted language learning to help students learn vocabulary. As well as the positive affordances offered by mobile devices, their technological limitations should also not be forgotten. The smaller screen sizes and lack of physical keyboard mean that the learning activities used in class or computer-based e-learning may not be appropriate. Learning content has to be adjusted accordingly to suit the medium. The fact that this area of Germany does not have complete mobile phone coverage also means that activities which require a constant internet connection may be not always be usable. Learning material which can be accessed partly or completely offline should therefore be given preference. Finally, the studies considered here were all relatively small-scale and short term. Conducting a similar experiment over a longer period (for example the full 15 weeks of a semester) with a larger population (150 students) may prove to be more complicated. It would however also produce more reliable results and add more to the body of knowledge in this area. Many researchers (Small, M., 2014; Ally & Prieto-Blázquez, 2014) agree that there is promising evidence about the success of mobile-assisted language learning but that more research, especially empirical research, needs to be carried out to confirm and expand upon these findings.

2.1 Quizlet and MALL

Quizlet (www.Quizlet.com) is a web-based vocabulary-learning program started by Andrew Sutherland in 2005 for a high school French class (Quizlet, undated). According to the website, the site now contains over 40 million study sets created by users, both students and teachers, from all over the world. To create a new study set, as for the Professional English: Engineering vocabulary, a user can either enter each item manually on the website or they can be uploaded from an Excel or .csv file. As an Excel document with all the vocabulary for the module already existed, this was uploaded to the site and then checked for any conversion errors. Thus the entire list of vocabulary was made available within a few minutes. It is possible to control access to a study set by making it public or private. Making a list private however means that a list of approved users has to be created and the users then have to log in to the site to gain access. Leaving the vocabulary list public meant that all students could have immediate access to it without any need to wait for approval or log in.

2.2 Research Methodology

A questionnaire consisting of 24 Likert-scale questions was distributed to a convenience sample of 26 second-semester students of Mechanical Engineering and Electrical Engineering during a Professional English: Engineering class at the beginning of the summer semester 2014. In addition, a total of 42 students of business and business with engineering-based degrees also completed the questionnaire. Although these students were not sitting the same Professional English: Engineering exam the vocabulary for their Business English: Professional exam had also been made available to learn using Quizlet.

In August 2014 interviews were conducted with a convenience sample of ten undergraduate students, 5 male and 5 female. The following five questions were asked to encourage discussion:

1. The vocabulary for all English courses can now be downloaded and studied using the Quizlet app. Have you already used the app and how did you find it?

2. How did you previously learn vocabulary? What advantages or disadvantages do you see in using Quizlet?

3. The Quizlet app has three modes: Cards, Learn and Match. Which of these have you used and how did you find them?

4. In a recent survey 73% of participants agreed or strongly agreed that mobile learning could help them learn English. Was do you think?

5. More than half of the survey participants (55%) would welcome it if tutors started to use mobile learning. What do you think?

Questions 4 and 5 refer to artefacts produced during the analysis of the student questionnaires. It was hoped that this "real-world" information would encourage students to reflect upon their own opinions on the subject.

2.3 Findings

The survey results showed that mobile phone ownership is indeed as common as thought with only one out of the 68 participants admitting to not having one. 48 of the respondents were male and only 20 female with the sample ranging in age from 19 to 37 years old with the mean age being 22.

When asked to comment on the statement "Mobile learning can help me improve my English", 77% of the engineering students and 72% of the business students strongly agreed or agreed.

The students were then asked to comment on "Using a smartphone for learning purposes would be easy". The majority of students were again positively inclined towards this statement: 62% of the engineering students and 52% of the business students agreed or strongly agreed. Only a minority disagreed or strongly disagreed (engineers=4%, business=10%) and a large percentage from both groups (engineers=35%, business=36%) remained unconvinced in either direction.

The third statement attempted to gauge whether the students themselves felt they were knowledgeable enough to use their smartphone as a learning tool. Here the students were very sure of their own abilities with 77% of the engineers and 62% of the business students agreeing or strongly agreeing with the statement.

The following statement could be considered the most important before investing time, money and energy in adopting a MALL approach. The students were asked to comment on whether they were interested in using their smartphones to learn English. The engineering students were clearly more interested in this proposition with 69% agreeing or strongly agreeing with the statement in comparison with only 50% of the business students. The business student group also included the most students who disagreed or strongly disagreed with the idea (17% and 7% respectively).

Statement 5 of this section explored whether support from the university would encourage students to make use of mobile learning. 57% of the business students agreed or strongly agreed with this statement as well as 50% of the engineering students. In the engineering group 35% of the students chose the neither agree nor disagree option compared to only 26 of the business students. 15% of the engineering students and 16% of the business students would not be more likely to use mobile learning if the university provided technical support. This may however not mean that these students do not want to use mobile learning. It could rather mean that they do not feel support from the university is necessary so its availability or lack of availability could have no impact on their decision to use mobile learning. A comparison with the positive responses to the second statement "Using a smartphone for learning purposes would be easy" and the third statement "I have the knowledge necessary to use a smartphone for learning" would tend to support this belief.

The sixth statement attempted to discover whether the students really wanted their teachers to make use of mobile learning. In response to this statement 69% of the engineering students agreed or strongly agreed and 45% of the business students. The remaining business students were not necessarily against the idea of using mobile learning, 36% said they neither agreed nor disagreed with the statement.

Statement seven examined the student attitudes to the costs involved in mobile learning. As almost all of the students taking part in the survey already own a smartphone the answers to this statement can be considered to be more in relation to software, bills from the mobile phone provider or backend costs for the university rather than for the students buying their own smartphone. 54% of the engineering students disagreed or strongly disagreed with this statement along with 55% of the business students. 35% of the engineers and 33% of the business students neither agreed nor disagreed, with the remaining students (12% of both engineering and business students) agreeing with the statement. No members of either group strongly agreed. It therefore seems that students do not expect high costs to be associated with the use of mobile learning.

The students were also asked how efficient they thought mobile learning could be. 38% of the engineering students agreed or strongly agreed with this statement in comparison with 43% business students. The biggest group of students was unsure and could neither agree nor disagree with the statement (46% of engineers and 45% of business students).

At the end of the semester, having spent the previous fifteen weeks learning vocabulary with Quizlet, a convenience sample of ten students (5 male and 5 female) took part in semi-structured interviews in an attempt to gather more qualitative data about their MALL experience. Looking at the individual questions posed, some common themes are present amongst the answers. As shown in table 1, the first question established that the vocabulary were available in Quizlet and asked for the students' experiences using it:

Table 1. Contextual analysis of interview question 1

When asked "Have you already used the app and how did you find it?" answers included:	
• Very helpful!	• ...really good...
• …great…	• …very convenient..
• …very useful…	• I have never used a better vocabulary training tool.
• …more fun…	• …super…

All ten of the respondents had already used the app and described it as a positive experience. Four of them also mentioned the mobility of the app allowing vocabulary to be learnt anytime and anywhere.

Question two examined the students' previous experience of learning vocabulary and what good or bad points they found about using Quizlet.

Table 2. Contextual analysis of email interview question 2

When asked "How did you previously learn vocabulary? What advantages or disadvantages do you see in using Quizlet?" answers included:
• Index cards.   • Printed A4 list.   • ..from the book..   • ..long lists…   • Phase 6.

One student mentioned using a PC program (Phase 6) to learn vocabulary and the remaining students used either index cards or a printed list. All of the students mentioned the fact that the vocabulary was already available as a time saving benefit. However two of them students did recognise that writing vocabulary by hand onto index cards is part of the learning process and that this opportunity disappears when one uses ready-made digital (or paper) flashcards.

The third question went into more detail regarding how the students made use of Quizlet.

Table 3. Contextual analysis of email interview question 3

When asked "The Quizlet app has three modes: Cards, Learn and Match. Which of these have you used and how did you find them?" answers included:
• Mostly the Learn function.   • All the modes – Match was most fun.   • I liked Learn mode the best.   • Cards mode.   • All three modes.

The playful game-based nature of the Match mode was mentioned by several students as being especially fun, rewarding and motivating. The fourth question presented the students with an artefact from the questionnaire results and asked for their opinion:

Table 4. Contextual analysis of email interview question 4

When asked "In a recent survey at the university 73% of participants agreed or strongly agreed that mobile learning could help them learn English. Was do you think?" answers included:	
• I agree. • As long as it is practical, yes! • It can definitely help. • …society shouldn't get too dependent on smartphones.	• It makes it possible to learn on the move. • Yes, mobile learning really helped me. • I am absolutely convinced. • …a good idea…

Finally, as shown in table 5, a second artefact was given to discuss whether students would like mobile learning to be implemented in the university.

Table 5. Contextual analysis of email interview question 5

When asked "More than half of the survey participants (55%) would welcome it if tutors started to use mobile learning. What do you think?" answers included:
- Can be useful.   …for other modules too.   - I would welcome it…   - I would like an app for every module.   - I can recommend it.   - Too many outside influences distract from learning.

As can clearly be seen, the student attitudes were largely positive although one participant did mention the same concern expressed by Kulkulska-Hulme and Traxler (Beetham & Sharpe, 2007) that learning outside of a classroom has a risk of distractions that can damage the learning process.

In addition to the questionnaires and interviews, the exam results from the two most recent semesters were also examined. Both compulsory technical English exam papers are structured in the same way with part one being 15 vocabulary which had to be defined in English. The results are summarized in table 6.

Table 6. Comparison of vocabulary section words defined correctly

Exam	N (participants)	Min	Max	Mean	Mode	Median
Technical English	88	1	15	9.70	15	10
Professional English: Engineering	55	0	15	8.95	15	9

As can clearly be seen the mean and median scores were higher in the first exam where the students did not officially have access to the Quizlet app to learn the vocabulary. As the cohorts are of different sizes a chi-square analysis should be conducted to confirm if these differences are significant. To aid calculation and increase reliability the results will be grouped into three categories: Poor (0-4 words correct), OK (5-9 words correct) and Good (10-15 words correct). This analysis will test the null hypothesis "There is no relation to the use of Quizlet to learn vocabulary and the number of points achieved" (see table 7).

Table 7. Chi-square analysis of vocabulary defined correctly

	Poor (0-4 correct)	OK (5-9 correct)	Good (10-15 correct)	Row totals
Technical English	15 (17.23) [0.29]	25 (24.62) [0.00]	48 (46.15) [0.07]	88
Professional English: Engineering	13 (10.77) [0.46]	15 (15.38) [0.00]	27 (28.85) [0.12]	55
Column totals	28	40	75	143 [Grand Total]

The resulting chi-square value of 0.94 is well below the critical value of 5.99 (df=2, level of significance=0.05) indicating that there is actually no significant difference found between the vocabulary points in the two exams. This therefore confirms the null hypothesis and would suggest that the use of the Quizlet app made no difference to student performance in this section of the exam.

3. CONCLUSION

Despite the mixed results of this study it seems that the use of mobile-assisted language learning does have potential. It is therefore very worthwhile to pursue further research in this area. The literature review and results show that there is a lot of room to expand and extend this work.

The students surveyed were very keen to make use of the Quizlet app and although it did not seem to lead to an immediate improvement in exam performance, the student perception of the learning process was positive. This positive attitude may lead to a long term effect which sees students remembering the vocabulary longer and more completely. As this project has not seen the use of Quizlet cause any harm it would seem that there is no reason not to keep the vocabulary available whilst nevertheless continuing to monitor student progress.

As mobile learning and mobile-assisted language learning are relatively new fields it would be interesting to explore this area further with continued research to gain a better understanding of what works best, slowly building towards a set of guidelines for the entire university.

Lominé's (2009) three factors when implementing m-learning should however definitely be kept in mind. The pedagogy, economics and technology must all be carefully considered to ensure students and staff perceive a genuine benefit to mlearning and it is not just seen as a fad or an attempt to be trendy.

At the end of the day, a positive student attitude is one of the most important factors in successful learning and even contributes to retention on a course. If the simple use of a mobile app for learning vocabulary can contribute towards an enjoyable and rewarding learning experience then we should definitely support it.

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