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MOBILE ASSISTED LANGUAGE LEARNING (MALL): TEACHER USES OF SMARTPHONE APPLICATIONS (APPS) TO SUPPORT UNDERGRADUATE STUDENTS' ENGLISH AS A FOREIGN LANGUAGE (EFL) VOCABULARY DEVELOPMENT

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ABSTRACT: *The purpose of this study is to highlight how smartphones, specifically smartphone applications, can be integrated into the vocabulary development of adult English as Foreign Language (EFL) learners in an English for Academic Purposes (EAP) or English for Academic Studies (EAS) context. In the literature on Mobile Assisted Language Learning (MALL), it is largely claimed that the development of language-related technology is on the increase. These ubiquitous tools, which may also be defined as widely-used, could potentially improve teaching and learning outcomes in vocabulary development, especially through applications installed on smartphones. However, there is limited research on how smartphones could be utilised sensibly, both inside and outside the classroom. The focus in the present study is on vocabulary development, as it is considered to be a priority area in language learning. This study was conducted using a case-study approach focusing on 20 EFL students at a university in Britain who were attending Pre-sessional EAP classes during the period of the study. Uses of smartphone applications were developed by the teacher, who also acted as the researcher in this study. The focus has been on the students' perceptions, opinions and overall experience of using these smartphone applications, as well as how effective they were. The intention was to discover how the tools can be incorporated into the learning process. The data were collected through questionnaires, a pre-test and a post-test, interviews, diaries and the researcher's logbook. The latter included a written report of the students' daily activities and learning experiences, their challenges and success/lack of success in learning. The study provides a rich description and analysis of the effectiveness of smartphone applications in vocabulary development mainly through qualitative data analysis. Limited use of quantitative analysis is made when reporting through numbers and percentages as well as displaying figures. It is anticipated that the results of the study will help to determine the appropriate use of smartphone applications in the vocabulary development of adult EFL students.*
KEYWORDS: Mobile Assisted Language Learning (Mall), Teacher, smartphone applications (apps), undergraduate students, English Foreign Language (EFL) vocabulary development

INTRODUCTION

The field of teaching and learning with smartphones has attracted the attention of numerous researchers for more than a decade, since the invention of smartphones.

Considerable research undertaken in the field praises the effectiveness of smartphone integration and reports on the positive attitude of both teachers and learners towards this commonly used tool that facilitates learning (Kukulska-Hulme, 2006). Similarly, the development of smartphone applications used for vocabulary development has been perceived positively and has resulted in numerous applications being developed, created and made available for installation on the Android market, as well as with Apple stores and smartphones (Godwin-Jones, 2011). However, little work has been undertaken to examine the quality of the developed applications, the competence and qualifications of the developers, the ideal number of words prescribed for learning on a daily basis and, most importantly, their effectiveness in developing academic vocabulary for EFL students in the context of EAP (Morris & Cobb, 2004). Consequently, there is a strong need for review of the design of strategies in order to guide future research in the design and integration of smartphone applications and to bring about successful learning and academic work that meets institutional quality requirements. Strategies that do not only focus on how to teach vocabulary but also focus on how to inspire learners' desire for learning.

Research questions

The central question to guide the current study is formulated as follows:

RQ1. How important is vocabulary development for an international student studying in the UK and what previous and present aid is available to them in order to enhance their academic word knowledge?

There are three guiding sub-questions that will shape the study, namely:

RQ1.1. How effective has adoption of an inclusive approach by learners to language learning been alongside smartphone-based support?

RQ1.2. What role does the instructor play in appropriately utilising the smartphone for both in- and out-of-class-learning?

RQ1.3. How does the social aspect of language learning influence vocabulary development and affect learners' perceptions of installed applications in comparison to socialising applications?

LITERATURE REVIEW

"Since their inception, the dimensions of cell phones have waned as much as their abilities have waxed" (Chinnery, 2006). It is more than a decade since this statement was made and humanity is now dealing with smartphones, which makes it possible to learn communicatively and access a variety of learning materials. One of the greatest benefits of mobile telephone learning, according to recent studies, is the informal learning environment. Achilleos and Jarvis (2013) state that the biggest and most major transformation is the anytime/anywhere information access alongside broader social and academic use. As a result, learners join a 'seamless learning space' (Chan et al., 2006, cited by Looi et al., 2010) and take advantage of learning in an informal context while creating their individual and social learning space. However, there is limited research on the integration of social media and the applications incorporated in the present study (Viber, WhatsApp, Telegram and Facebook Messenger) that are mainly used for socialising. The following tables are summaries of lengthy paragraphs and literature reviewed in these areas: summary of most recent research supporting

technology integration in ELT and learning, summary of refuting studies on most recent research on technology integration in ELT and learning, summary of major and supporting studies on EAP and academic vocabulary development and finally, how the present study relates to previous research.

Table 1. Summary of most recent research on technology integration in ELT and learning

(Smartphones)	• Interactive communication through smartphones **(**Chinnery, 2006) • Smartphones allows wise use of free time for learning (Kukulska-Hulme, 2009) and allow for collaboration and socialisation during learning (Kukulska-Hulme and Shield, 2008) • Mobile phones enhance regular study, lead to more exposure to the target words and more vocabulary gains (Viberg and Gronlund, 2013) • MALL has a significant supplementary role in the teaching of new vocabulary items (Khazaei & Dastjerdi, 2011, cited by Tosun, 2015) • Social inclusion in language learning is expanded (Chinnery, 2006) • Students learn vocabulary more effectively with mobile telephones than with paper, on a short-term basis (Zhang, Song & Burston, 2011, cited by Tosun, 2015) • Mobile-based audio books improve performance in learning vocabulary (Azar and Nasiri, 2014)
(Apps)	• Use of apps in smartphones for vocabulary learning have reported positive results (Viberg and Gronlund, 2013) • The exploitation of touchscreen possibilities and the most advanced feature of a smartphone can be ideal for individualised informal learning. The power and versatility of smartphones allow their users to make these tools as a primary or even sole computing device (Godwin-Jones, 2011)
(Messaging)	• SMS-based learning is more effective (Kukulska-Hulme, 2009) • Photo messaging possible through smartphone apps (Kennedy and Levy, 2008); (Cavus and Ibrahim, 2009); (Thornton and Houser, 2004) • Easier words and spaced sessions enhance language vocabulary learning (Thornbury, 2006); (Cerni and Job, 2012) One of the proposed vocabulary acquisition techniques is the "pushing" and "access" theory for intentional vocabulary learning (Thornton & Houser, 2001, 2004, 2005; Stockwell, 2007, 2008, 2010; Song & Fox, 2008; Kennedy & Levy, 2008; Lu, 2008) • Pushing refers to short messages containing vocabulary items, sent to learners at spaced intervals which presumably push them to learn the words. Access, on the other hand, refers to the accessibility of the mobile telephones and their ready-to-hand access which could also function as a personal 'learning hub' (Wong & Looi, 2010) • Using this technique, learners are able to turn "dead time" into useful study time (Stockwell, 2010)

Table 2. Summary of refuting studies on most recent research on technology integration in ELT and learning	
(Smartphones)	• Challenges of smartphones: reduced screen sizes, limited audio-visual quality, virtual keyboarding, limited power and one finger data entry (Chinnery, 2006) • Smartphone challenges with Internet connectivity (Howland et al., 2012; Stockwell, 2010) • Smartphones not as authentic as large screens iTVs (Fallahkhair, Pemberton and Griffiths, 2007)
(Apps)	• Mobile phones not designed for learning/educational purposes (Kukulska-Hulme's, 2005) • Smartphones majorly designed in foreign language (Burston, 2014) • Mobile phones designed in native languages are not suitable for second language learning (Goodwin-Jones, 2011)
(Messaging)	• Students lack interest in using digital tools (Tosun, 2015) • Online learning should be blended with face-to-face learning to be effective (Carrier, 2006) • No difference between using smartphones and traditional learning methods (Macaro, Hendley and Walter, 2012); (Zhang, Song and Burston, 2011)

Table 3. Summary of Major studies that support EAP and academic vocabulary development
• "Vocabulary is the backbone of any language" (Tosun, 2015) • Acquiring an extensive and varied vocabulary is important for communicative competence (McCrostie, 2007) • It is the insufficient size of vocabulary that hinders the development of other language skills (Yang, 2004, cited in Wang and Shih, 2015) • EFL and ESL students experience the challenge in the language fluency (Fisher et al., 2012) • The mastery of vocabulary leads to better comprehension; this leads to enhanced language acquisition (Ahmad, Armarego and Sudweeks, 2013) • The knowledge of vocabulary contributes to the academic success (Morris and Cobb, 2004) The learner is required to understand the 5,000 base words in a non-specialised English test and 1,200 words for largely unpredictable speaking activities (Laufer, 1997; Nation, 1990, cited in Thornton & Houser, 2005)

How the present study relates to previous research

In the present study, words are not sent to smartphones as plain, dull text messages with definitions. They are sent as multimedia messages (see image below) that allow for more in-class time for oral language learning such as speaking and discussion, by using the time spent on pre-teaching vocabulary outside the classroom. Likewise, this is not only to be able to easily send multimedia messages, increase communication and allow collaboration (Crismond, 2012), but also have all participants added to a group and be able to monitor their "read" and "seen" reports of the messages. This is important, because the majority of the learners' socialising apps have become their most accessed and opened apps.

Image 1. Example of multimedia messages sent to participants daily

The present study relates to Nation's (2005) study regarding vocabulary acquisition in the pre-smartphone era in a range of ways, taking on board a number of key principles: a) Vocabulary exercises are carefully prepared in advance, b) Learners can learn from each other in small groups (VWTFM groups), c) Vocabulary items need to be met and met again (can be met in textbooks in the classroom, as words are taken from the course book), d) Student-centred approaches should go beyond rote-memorisation. To sum, vocabulary knowledge will always lie at the heart of content learning. It is the foundation for the comprehension of all other skills in language learning. Just like all learning is believed to be social, vocabulary instruction also needs to be based on interaction between the teacher and the learner(s). Acquiring the knowledge of vocabulary should not be an isolated skill, but aid learners to become effective readers, effective writers, effective speakers and effective listeners in order to comprehend and convey coherent messages (Fisher and Fray, 2014).

METHODOLOGY

The present study investigates the use of two types of smartphone applications in vocabulary development of EFL learners. Following data collection, throughout this project, Meyer (2001) is used as a guide for the data analysis process (pp.329-352). The process includes stages in which chronology, coding, and data recording is used to analyse data according to themes and issues. As can be seen in Figure 1, each stage is preceded by a pre-test and is followed by a post-test assessment.

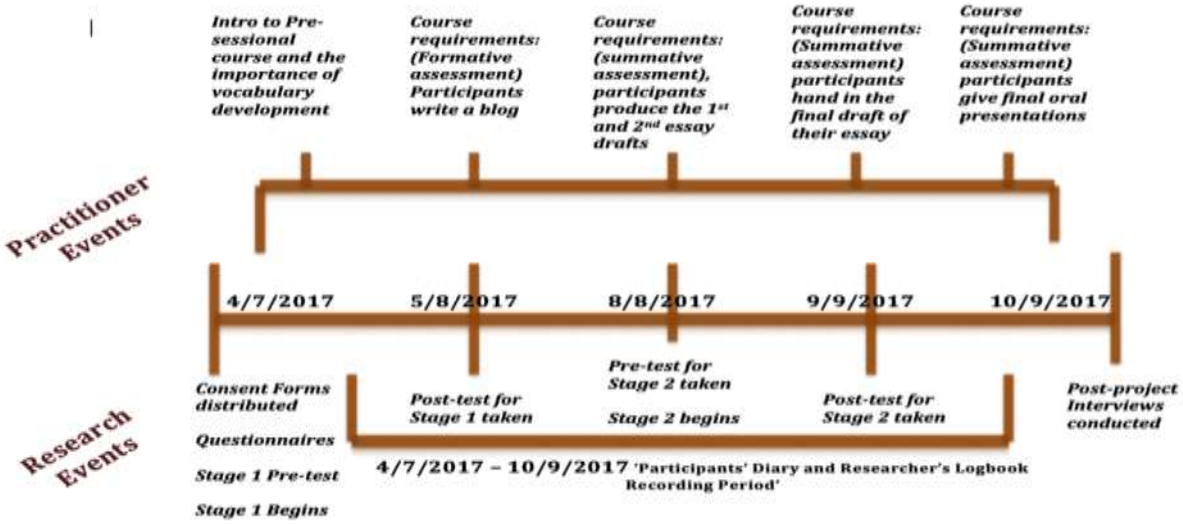


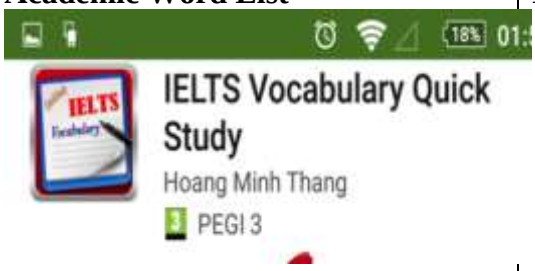
Figure 1. Data Collection Stages

The methodology is based on a case study approach, with a view to providing an analysis of the context and processes involved in the phenomenon under study (Meyer, 2001) as well as an in-depth exploration from multiple perspectives of the complexity and uniqueness in a real-life context (Simons, 2009, cited in Thomas, 2011). A combination of qualitative and quantitative approaches was suitable for this study since they sought to find out the variables within the study area, in the form of attributes, numbers or percentages, opinions and views from a particular social group (Bryman, 2012). Moreover, the present study has opted for triangulation, using multiple methods and data sources, which, according to Mathison (1988, cited in Pagliaro, 2010) can enhance the validity of research findings and result in effective research practice. The study analyses responses obtained from pre- and post-tests; questionnaires (prior to commencing the study, see appendix 1 for coding); interviews (at the end of the study); diaries and researcher's log. In terms of sampling, it was necessary to target 20 EFL adult learners enrolled on a pre-sessional EAP course at a university in Britain. The participants were aged between 16-35 years and had come from different countries. The participants were informed about the nature of the work being carried out and that their participation in the study was voluntary.

The digital tools used in the present study were smartphone applications (Image 2). These applications were used to aid the participants' vocabulary representations through multiple modes. The **first type** of application incorporated was the 'IELTS Academic Word List' installed in their phones. Participants were instructed to go through the first 10 lessons in package 1 (200 words) only. Prior to embarking on the learning, participants were provided with a pre-test for the 200 target words. The case of learning words from an installed application ran for 5 weeks and the participants were required to learn the 200 words, using their own personal practices, followed by a post-test. The **second type** of applications were socialising applications such as WhatsApp, Viber, Telegram and Facebook Messenger. These socialising applications were already installed on many of the participants' smartphones.The main reason for choosing these applications was the observation that the majority of the learners used them frequently. So, the remaining 200 words were sent to the learners

via these applications, on a daily basis, as multimedia messages. Learners were sent 5-6 new words with images, definitions, examples, derivatives or word families as well as their pronunciation each day. Similarly, this phase also ran for another 5 weeks and there was a pre-test and a post-test for these 200 target words.

A. Installed application for vocabulary learning: IELTS Academic Word List



B. Socialising applications: WhatsApp, Viber Telegram and Facebook Messenger

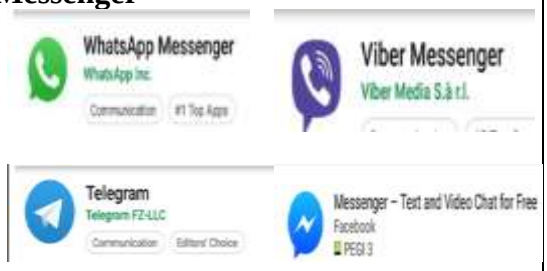


Image 2. The two types of applications incorporated in the study (Installed and Socialising Apps

Data Presentation

In this part, the qualitative evidence is used as primary evidence and supported with some quantitative evidence (participants' feedback is supported by their performance in tests). The main research outcomes are identified through interviews, diaries and logbook entries and categorised into six groups. These six groups are based on six perceptions developed by the researcher in light of participants' responses to interview questions, diary and logbook input. Appendix 2 shows an individual learning record of all twenty participants. Their knowledge of words before the study is compared to the words acquired after the study with both types of applications. The green colour is an indication of gaining above 60% that could be defined here as 'successful' learning and labelled as 'outstanding performance'. The yellow colour indicates gaining 40 – 60% and is defined as 'above average performance'. The grey colour shows 20 – 40% and is labelled as 'average performance'. Gaining below 20% is labelled as 'below average performance' and labelled with amber colour, and finally the red colour indicates 'no improvement' or where the participants did not attempt learning. These participants provided valuable feedback during the interview stage and when recording personal experiences in their diaries regarding their progress and reasons for language development. Key remarks and comments made by the participants (recorded during interviews, diary and logbook entries) are also reported.

The key themes are as follows and illustrated in tables:

1. Perceptions of traditional approaches for vocabulary acquisition.
2. Perceptions of using the installed applications for vocabulary acquisition.
3. Perceptions of using the socialising applications for vocabulary development.
4. Perceptions of participants' satisfaction with the two types of applications for vocabulary acquisition.
5. Perceptions of technical and non-technical challenges faced by the participants during vocabulary acquisition.
6. Perceptions of personal practices for vocabulary acquisition.

Table 4. Perceptions of traditional approaches for vocabulary acquisition

Traditional approaches
Categories and Supporting quotes from participants
Previous Learning Experience **Overview:** Some participants were brought up with traditional approaches and might not easily adapt to modern learning approaches. Also, in some developing countries there is a lack of technological infrastructure in educational institutes, as a result, learners are still exposed to traditional approaches, which they take with them even when studying abroad. *"Technology is complicated and expensive", "Phones are for talking and chatting not learning","Communication with native speaker" ,"I write the new words down 10 times followed by memorization and translation into first language"*
Physical Attachment to the Materials **Overview:** Carrying a paper book and a hard-copy diary may no longer be fashionable and may seem out-dated. But for some learners, it is a bond created with the materials that subsequently creates an experience of 'real' learning with traditional approaches that might not be obtained with the use of technology. In this case, the use of sticky-notes is reported to be effective for vocabulary development. *"Real feeling of learning by touching your resources like books and sticky notes","I am able to read and revise with sticky notes without planning, even when cooking" ,"Same note and screen without moving, but phone screen moves and changes" ,"I like to learn new words on the wall, old words in bin"*
Problems with Technology **Overview:** While the integration of technology in language development may be widely accepted and a modern approach, it is not always effective. Similarly, some of the learners in the present study had come from slightly indigent backgrounds, sponsored by their government to study in Britain and were therefore not able to afford expensive and latest smartphones, and hence faced unpleasant technical experiences. Moreover, the frustration caused by technical and functional problems with technology may result in hindering the learning. *"Dictionaries are expensive to install" ,"Problem with phone memory, uninstalling and reinstalling the apps" ,"I am traditional learner and don't use phone much" ,"The messages and messaging tone kept distracting and disturbing me" ,"My phone kept freezing" ,"Lost my phone and lost all messages and apps"*

Table 5. Perceptions of using the installed applications for vocabulary acquisition

Technological approaches (installed app)
Categories and Supporting quotes from participants
Available Anytime, Anywhere **Overview:** The majority of the latest smartphones offer a plethora of learning applications that might be popular, downloaded by thousands of users and highly rated as well. The fact that an entire selection of words is available on a tiny handset and can be anywhere, anytime, encourages the majority of language learners to opt for such installed applications. *"Available anytime, anywhere", "Regular updates and new features, available anytime and anywhere"*

Technological approaches (installed app)
Categories and Supporting quotes from participants
Modern Learning Approach **Overview:** Most of these applications are not opened for planned learning, but rather used asynchronously, used to pass time, while in public where there is a lack of verbal communication and the contagion of everyone fiddling on their smartphones. *"I like spending time on my phone", "Who doesn't learn with technology anyway"*
Overall Opinion of the Installed App **Overview:** As mentioned above, language learning applications might seem popular and installed by numerous users. However, it is equally important to research the effectiveness of the application, the 'Reviews', the overall rating and most importantly if the app is developed by an individual or an institution. *"They are useful but they take memory of my phone", "Installed app was boring, didn't even open the app, the meanings in installed app were more difficult than the actual word"*

Table 6. Perceptions of using the socialising applications for vocabulary development

Technological approaches (socialising apps)
Categories and Supporting quotes from participants
Use of Media **Overview:** The socialising applications are reported to be more interesting, fun and interactive when compared to the installed application. Learners felt more satisfied not only with the use of the applications, but also with their language progress. *"I like learning with videos and images", "I learn better with pictures and I learned in a new and interesting way", "I like to send emojies and photos", "Not only me, learned the words but my friends too with forwarded messages", "Fun and interesting",* *"I save words with photos in media and access later",* "*I liked the pictures and pronunciation"*
Collaborative Learning **Overview:** Contrary to the isolated learning in installed application, the socialising applications were more collaborative and interactive, that allowed the learners to learn in a group, while the teacher is still in charge of the instruction and delivery of learning materials. *"I can share my learning with others", "There was a competition, I like learning in group than learning alone", "If I become a teacher, I will teach on these apps too"* *"Because all my friends use these apps", "These apps are easy to use and understand, they are popular"*
A Unique Experience **Overview:** The socialising applications have certainly been used previously, by the participants, but probably mainly for socialising purposes. To have them used for learning informally, to the majority of the participants, it was a new and a unique experience and a positive one. *"Everyday learning", "Real learning with real teacher", "Not only me, learned the words but my friends too with forwarded messages", "Able to learn a fixed number of words, not a whole list", "Appreciate the teacher's hard job and teaching with love", "It was something new and therefore interesting", "I loved the pictures and learning in group"*

Perceptions of participants' satisfaction with the two types of applications for vocabulary acquisition

As far as preference for a particular aspect of the socialising applications is concerned, 'images and visuals' are amongst the most liked features, followed by audio clips or pronunciation of the words. There have only been a few "least liked" features reported with the socialising application and they were:

'Technical problems with the mobile handsets'
'Distraction because of the constant notification tones of the new messages sent'
'Participants not willing to allocate out-of-class hours towards learning'

As for the installed Stage 1 AWL application, most of the participants' overall opinions were positive but perhaps less supportive in the development of their vocabulary, when compared to the socialising applications. Only 3 out of 20 participants liked the installed AWL application and reported positive outcomes. Furthermore, 6 out of 20 participants liked the installed application but stated that the application was not as effective as the socialising applications. The remaining 11 participants did not express a very positive view about the installed application, which resulted in little or no attempt at learning.

According to the findings in the present study, almost all of the participants preferred the socialising applications. Nineteen out of 20 participants would definitely use them for future learning. The majority of the participants in favour of the socialising applications have also performed significantly better in their post-tests according to Figure 4. The participants' feedback on the socialising application incorporation was not only generally positive but they also specified which particular aspects of the application were mostly liked and found effective. It has been these specific added features to the socialising applications that made the learning different from any other vocabulary learning application available to install on smartphones. It was the attractive and interesting images used in the socialising applications that encouraged the recipient to open the notification and look forward to watching the visual image before reading the target word.

Perceptions of technical and non-technical challenges faced by the participants during vocabulary acquisition

The majority of the participants had not reported any major problems encountered during the study, with the applications implemented in both stages, only 3 out of 20 participants experiencing unpleasant incidents. The problems included:

- 'Losing their phone'
- 'Low storage/memory in handset
- 'Shared learning in socialising groups, where group members were able to access each other's contact details

Table 7. Perceptions of personal practices for vocabulary acquisition

Individual learning approaches
Categories and Supporting quotes from participants
Visual Learning **Overview:** The availability of visual materials for learning online, on TV and on mobile handsets have already dominated the attention of most language learners. The most popular visual material is considered to be the videos with subtitles. *"Watching videos solves understanding different accents problems", "Improves listening and reading and pronunciation", "Watch the meaning not guess"* *"You can pause video to copy the new words", "Real situation to learn the words in but miss faces while reading"*
Auditory Learning **Overview:** Alongside visual stimuli, some learners also find listening to the target language effective. It has also become a fashion to be out in public with headphones on and have the target language practised. Fortunately enough, some of the participants in the present study had also followed the norm and reported positive outcomes as a result. *"I record my voice, read sentences and listen to it later", "I listen to my recorded voice which has the new words before I go to sleep, because I cannot sleep easily, but sometimes when I wake up in the morning, I forget the words, so I play again when I have my breakfast"*
L1 Translation of the Words **Overview:** Similar to the statement in the overview of the traditional approaches above, L1 translation is also the standard learning approach for the majority of the learners, and almost all of the participants in the present study who had not shown favouritism towards mono-lingual English dictionaries. This part is discussed further with examples. *"I need to know the meaning in my first language, sometimes they are not accurate", "It speaks my mother language", "I grew up with words in English and meaning in first language", "I cannot understand English to English translation", "It is easier to understand"*
Mnemonics **Overview:** Learning a new word and retaining its meaning is not always easy and requires different techniques. Each technique is unique to the individual and might not be as effective to another individual. The participants in the present study had also applied mnemonics for longer retention. *"Two days ago, I matched the word stubborn to my friend. Today I saw my friend and remembered the word stubborn", "I like relating the new words to my friends. Today I matched the word 'Frugal' to my friend and I sent him a message that he is so frugal that he goes to bed hungry", "I put all new words in sentences and make sentences about my friends and examples of what they are"*

Smartphone applications (socialising applications in particular) have certainly proven to be effective in vocabulary development and were encouraging at least 16 out of 20 participants to learn more words with their 'fun', non-educational features that were used for educational purposes. These 16 participants had not experienced learning with these applications previously and they perceived the approach to have significantly

improved their vocabulary knowledge. The positive outcomes have mainly been due to:

- the informal learning setting outside the classroom, while covering formal instructions for in-class use
- the involvement of a professional educator, especially when the learning community is less formal, but more social
- the availability of learning materials in the students' pockets while most of the course contents are not portable or storable in smartphones

To elaborate further on L1 translation and it's effectiveness in vocabulary development, one of the primary reasons for not using a monolingual dictionary is that the definition is given in the learner's non-native language. A problem which has also been reported in previous studies, for its syntactic complexity, idiomaticity, and cultural specificity, results in the definitions being more difficult than the word they define (Amritavalli, 1999).

Having observed the student participants' preference for using bilingual dictionaries, we could take the example of the word "cat" from the famous English language dictionary, Cambridge. The definition for the word cat is as follows: 'a small animal with fur, 4 legs, a tail and claws, usually kept as a pet or for catching mice or any member of the group of similar animals such as the lion' (Cambridge Advanced Learner's Dictionary, 2018). Having considered the example, the following issues need addressing: 1. The native English speaker knows what a cat is; 2. The non-native English learner is most probably going to use L1 translation or Google Images and see what a cat looks like; and 3. The target word cat might not be as difficult to find the meaning for as the new words that have occurred in the definition of this simple vocabulary item. For example: fur, claws, tail, pet and mice where the learner is made to search for 5 additional new words (search for the definition of the definition). This is illustrated in Figure 3. So where does this leave the popular mono-lingual dictionaries with thousands of entries and their definitions?

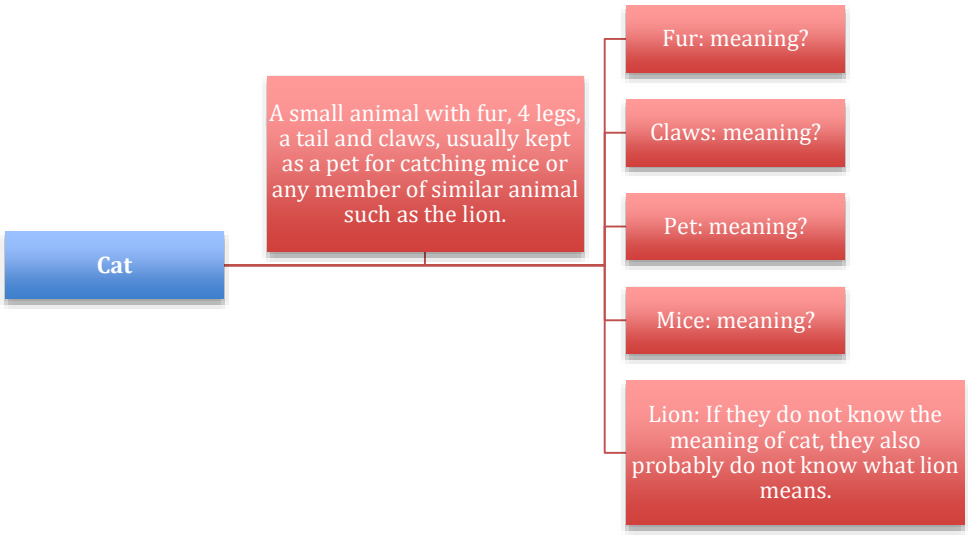


Figure 2. When meaning and definitions are more difficult than the word

To conclude, vocabulary teaching with instructions and prescriptions might not always be effective. Despite all the efforts of sending new words as multimedia messages in

the present study, to some extent, the approach has not been a perfect solution for all participants when compared to the learning approaches which they had chosen for themselves. It is therefore necessary to accommodate learner autonomy and individually preferred learning methods. As far as the installed smartphone applications particularly developed for vocabulary enrichment are concerned, mobile applications and computer programs and other digital tools are useful for practicing revision and vocabulary reinforcement since they can hold an extensive amount of data and could be easily carried around and accessed anywhere, but may not be ideal for first encounter or learning for the first time.

Pre-test and post-test results from both stages

In Figure 4, the majority of the participants indicated knowledge of 100-140 words out of 200 in the pre-test. This number was expected to increase in the post-test after learning more words from the installed application. On the contrary, the number seemed to drop. The counterproductive results were supposedly due to randomly selecting the answers in one of the tests or forgetting the meaning of words in the post-tests. As far as the test results in Stage 2 are concerned, in Figure 4, the pre-test reveals that the majority of the participants knew 60-100 out of 200 words. After receiving the words on their socialising applications for five weeks, the post-tests showed that only a few participants lacked improvement, while most of them succeeded in developing their word knowledge to a greater extent. Therefore, Figure 4 shows that the incorporation of socialising applications has assisted the learners in learning more words, in comparison to the installed application.

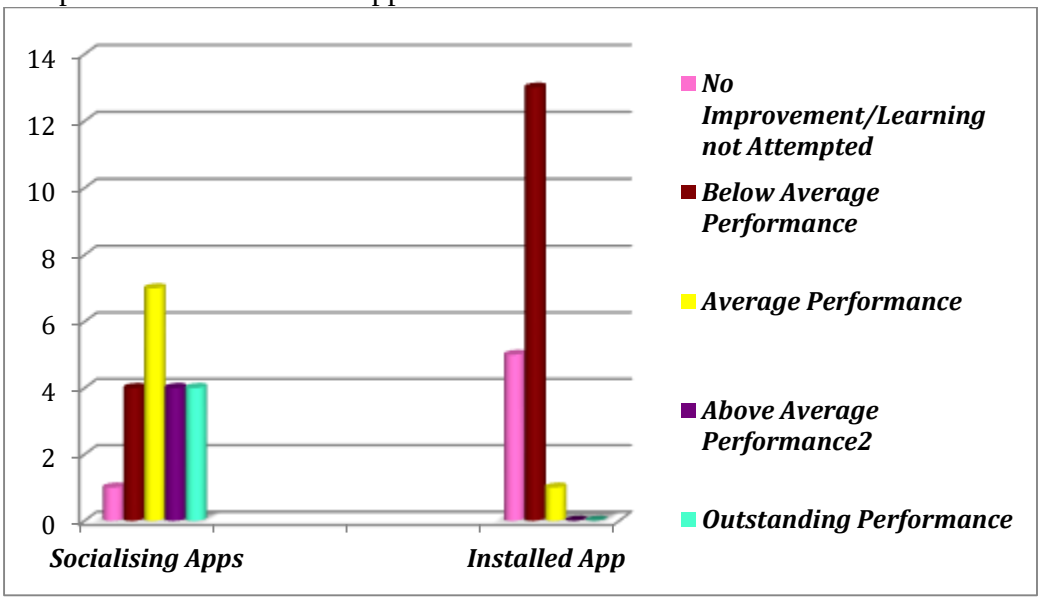


Figure 3. Summary of results obtained from post-tests

To sum up, the outcomes from the test results of the two stages are not only based on the learners' preferences for traditional or technological approaches, but they are also based on other factors such as the type of application which they were using (installed app or socialising apps/boring or interesting), the contents of the applications used for learning (suitability of the chosen words according to the level and needs of the learners), the interaction between the learners (learning alone or collaboratively), the materials (general, academic or English for specific purposes words), and the facilitator

(the app developer or the learners' course instructor). Therefore, the post-test results support the quotes obtained from interviews, diaries and logbook regarding learners' preferences for incorporating the socialising applications for future learning too (based on the aforementioned qualities) and facilitated by the teacher, as well as their own personal practices that have resulted in such outcomes, therefore shaping the present study.

Discussion of research questions

In responding to the main research question**,** regardless of how competent a learner might be grammatically, communication in any second language is impossible in any meaningful way without the knowledge of vocabulary. Likewise, vocabulary development is a priority area in language learning and the biggest, single component of any language course, expressing the wide range of meaning through the knowledge of words (McCarthy, 1990) as well as having a great importance in the four pillars of any language: speaking, listening, reading and writing. The guiding sub-questions are discussed as followings:

RQ1.1. How effective has adoption of an inclusive approach by learners to language learning been alongside smartphone-based support?

According to the findings in the previous chapter, the majority of the participants had incorporated non-application or personal practices for developing their vocabulary. These individual approaches included:

- Auditory learning (learning by listening to their own recording that included the target words).
- L1 translation of the target words and using bilingual dictionaries.
- Mnemonics
- Immersion and living in the target language country.
- Learning by teaching (forwarding and teaching the received words through the socialising applications to friends in other groups).
- Using the more traditional sticky notes.
- Visual learning and the incorporation of TV programmes and movies with subtitles in particular.

The above points, that are based on learners' personal practices and used for vocabulary development, can be combined with smartphone applications for effective acquisition of academic vocabulary items. Appendix 2, shows the individual learning record of all twenty participants and as can be seen, the participants with the highest score are mostly the ones who have incorporated personal practices alongside smartphone applications.

RQ1.2. What role does the instructor play in appropriately utilising the smartphone for both in- and out-of-class-learning?

The instructors are responsible for the knowledge, skills and abilities that these students are going to possess by the end of their studies in the pre-sessional courses, that will be lasting and of significance to the learners (Palloff & Pratt, 2009). As one of the targeted audiences of this study, pre-sessional instructors are not only expected to help learners' improve their EAP language in oral and written skills, but also facilitate developing students' vocabulary skills both inside and outside the classroom. The findings in the present study indicate that it is equally important for the instructors to implement

strategies that could maintain the learners' interests and motivations in the task of vocabulary development instead of producing a long list (on a paper or a smartphone app) of words at the beginning of the course and dismissing them with a mundane task of memorising and learning the words. Participants also believed that it is important to make sure that learning progress is consistent at every stage (which words to learn and when) and they do not feel overburdened with the number of recommended words to learn. The "learning burden" (Nation, 2001 p:23) in the present study was reduced by the instructor. The instructor carried most of the burden by spending time outside the classroom, preparing slides, selecting images and examples and subsequently, provided the learners with the target language in the comfort of their homes, in an informal and sociable way.

The instructor is not only expected to play the role of a language teacher, but they should also play the role of a group member – actively involved in the learning, a community member – establishing a learning community and being a member of the community, a comic and an entertainer – providing humorous and interesting visual illustration to motivate learners, a mentor and a facilitator as well as consolidating autonomous learning outside the classroom, while playing the role of an observer for a successful recall inside the classroom. Consequently, participants not only enjoyed learning, but most of them succeeded at developing their vocabulary knowledge and achieving above average scores in their post-tests.

RQ1.3. How does the social aspect of language learning influence vocabulary development and affect learners' perceptions of installed applications in comparison to socialising applications?

Installed application

The entries in the installed application incorporated in the present study were randomly selected and they were not from the same language level as described (IELTS). The packages in this application contained words from different levels. On the one hand, there are words that are extracted from an advanced level source such as 'superficial', 'prudent' and 'innumerable'. On the other hand, there are words that are selected from an elementary level, such as 'mouth', 'billion', 'pop-corn', 'keyboard' and 'teapot'. This raises questions regarding the quality of the application and the fact that the application is not developed by someone who has knowledge of common IELTS words. The overall reliability of such applications is questioned in Image 3.

Image 3. Random selection of words and spelling errors found in the installed app

Installed applications therefore, might be useful for generating learner autonomy, since learners have the option of making their own notes as well as trying to find their own approaches for learning and practising, but equally important is what they learn (the quality of the application, the knowledge and skills of the developer, the accuracy of the contents, words and their definitions, example sentences and spelling) and how they can retain the learnt words.

Socialising applications

One of the main attributes of the socialising applications in the study was the incorporation of images of the target words. The visual incorporation of definitions in the dictionaries is not new. Numerous other popular sources (Cambridge Picture Dictionary (1996), Oxford Photo Dictionary (1992), Longman Photo Dictionary, paper and audio CD pack by Breng (2006) published by Pearson Longman,) have already embraced the strategy and are developing it further in the future. However, most of the contents in the aforementioned sources refer to concrete nouns, where finding images is easier than abstract nouns, and mostly aimed at young learners. Similarly, the involvement and interaction between the teacher and learners on each and every learning occasion, which according to Palloff and Pratt (1999, cited by Carrier, 2006) "primarily generates knowledge" and the fact that interaction between them could be an apparent reason for success in learning with technology because human beings have always been fascinated by other humans (Keddie, 2015). This is in contrast to the robotic and artificial facilitator and interaction that takes place with the many installed applications on smartphones.

CONCLUSION

According to data collected, the present study emphasizes that education applications in smartphones should be matched to the approaches of learners (visual, auditory, modern or traditional learner, perhaps), the level of learners (beginner, intermediate or advanced) and learners' needs (general English, academic English or IELTS).

Moreover, plain vocabulary development applications may not be the absolute aids for language learning but there are other aids that need to be incorporated for more successful learning. For example, images, definitions, regular repetition, added L1 notes, and if possible linking or attaching a photograph to a new word in order to remember the meaning of the words for longer for an enhanced learning experience. By having the aforementioned features, the application could become unique and possibly stand out from amongst a hundred other vocabulary development applications available for installation on smartphones.

To conclude, a single approach may never be successful at vocabulary development. According to the data collected and feedback received from the participants in the present study, while the social aspects of language learning and the adoption of inclusive approaches somehow proved to be of success, it is down to the teacher to facilitate these two. The teacher's role therefore is vital in language learning for the following pedagogical reasons too:

- The number of words selected to teach on a daily basis should be appropriate and in accordance with the learners' levels and language learning abilities
- Words should be provided at regular intervals and not inundating the learners with the entire wordlist
- The words selected should be useful to the learners in term of their needs
- Words should not be taught in isolation, but in sentences and through examples.
- Most importantly, words should be taught and delivered alongside their visual stimuli for better retention and to instill motivation to learn
- Learners need to be in charge of their learning, but teacher involvement is as important, especially during the initial stages of learning. If the teacher is empowered and able to facilitate the learning in an interactive way, they may become the developers of their own applications

The above points were incorporated in the present study and resulted in positive outcomes, placing the teacher's role in the vanguard of language learning, despite the ubiquity of technology.

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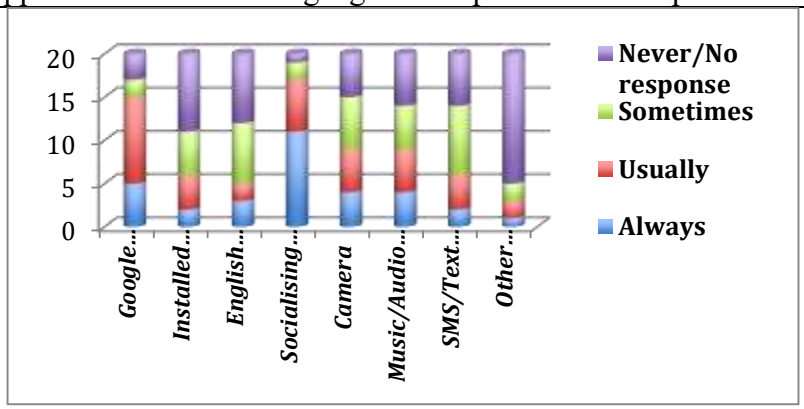
Appendices

Appendix 1. Questionnaires (Participants reporting prior experiences / attitudes to learning) / **#of responses: (N= 20)**

General demographics **Q1. Gender:** Male: N=9 Female: N=11 **Q2. Age** 16-24: N=8, 25-35: N=12 **Q3. Nationality:** Chinese: N=7, Jordanian: N=1 Cypriot: N=1, Thai: N=1 Libyan: N=7, Morocco: N=1, Saudi: N=2 **Q4. Course** Pre-sessional: N=16 Ex-Pre-sessional Sts: N=4	Learning experiences **Q5. Past learning approach(es):** EL Classes + EL Books: N=5, EL classes + EL books + TV+ face to face interaction: N=4 EL classes + TV/Films:N=2, EL classes + EL books + TV+ Online/ Websites (TED Talk): N=1, TV + 1-2-1 Online: N=1 EL classes + EL books + TV+ online learning +face to face interaction: N=2 EL Classes + El Books + Google translation: N=3, TV = Self-study through listening to music: N=2 **Q6. Current learning approach(es):** EL Classes + EL Books: N=6, EL classes + EL books + TV+ face to face interaction: N=2 EL classes + TV/Films: N=5, EL classes + EL books + TV+ Online/ Websites (BBC Learning): N=1 TV + 1-2-1 Online: N=0, EL classes + EL books + TV+ online learning +face to face interaction: N=3, EL Classes + El Books + Google translation: N=0 EL Classes + socialising through social networks: N=3
The development of learners' English language in Britain **Q7. Examination and score:** IELTS: N=20 4.5: N=2, 5.0: N=12, 5.5: N=2, 6.0: N=0, No resp: N=6 **Q8. EL improved in Britain:** S/agree: N=4, Agree: N=8 Neutral: N=7, Disagree: N=0 S/Dis: N=0, No res: N=1 **Q9. Reasons for language development in Britain:** Pre-sessional course: N=9	Learners' opinion about the integration of technology in language development **Q10. Technology helps in language development:** S/agree: N=6, Agree: N=10, Neither agree nor disagree: N=4, Disagree: N=0 S/Disagree: N=0 **Q11. If agree why?** *(highest to lowest frequency)* A) Online studies (N=4), B) the availability of translators and dictionaries (N=4) C) The use of social media and chatting through smartphone apps (N=3) D) can easily find learning resources (N=2), E) can learn new words + pronunciation through downloaded apps (N=1), F) watching movies (N=1), G) Youtube (N=1) H) Interaction with others (N=1), I) Messaging: (N=1), J) Saved images with repetition (N=1), K) Use of smartphones for translation (N=1)

<table>
<tr><td>Immersions + socialising and social media: N=8, Other reasons: N=3</td><td colspan="2"></td></tr>
<tr><td colspan="3">Learners' opinion about tools that are perceived effective for language development</td></tr>
<tr><td>Q12. Effective tool(s) for language development:
PC/laptop + iPad/tablet + e-reader: N=4
Mobile/smartphone: N=13, Digital pocket dictionaries: N=1, Digital dictionaries installed in smartphone: N=2</td><td>Q13. Own smartphone + internet:
Yes: N=20, No: N=0</td><td>Q14. Frequency of smartphone use:
Every 30 mins: N=6, Every hour: N=6
Every 2 hours: N=4, 2-4 times a day: N=3, Once a day: N=0, Other: Every 5 mins: N=1</td></tr>
<tr><td colspan="3">Learners' responses to applications used for language development on smartphones</td></tr>
<tr><td>Q15. Language on smartphone:
Only English: N=8
Mainly English + some 1st language: N=4
Mainly 1st language + some English: N=8</td><td colspan="2"> 

Q16. Apps used most frequently on the smartphone:</td></tr>
<tr><td colspan="3">Q17. Apps used for EL learning/how often:
Yes (but not too often): N=12. If yes, which apps? (ordered from most frequent to least frequent) No: N=8
Wechat (N=1, every 30 mins), Google translator (N=3, everyday), Maps Chrome (N=1, everyday), Guardian (N=1, twice a week), Combly speaking practice (N=1, every month), YUDOA (N=2 usually), Installed dictionary (N=1, sometimes), TED (N=1, sometimes), (BAICI ZHAN, N=1 sometimes), Listening practice, (N=1, sometimes), Podcasts (N=1, sometimes),</td></tr>
<tr><td colspan="3">Learners' attitude towards the importance of vocabulary learning in English language</td></tr>
<tr><td>Q18. Importance of vocabulary development:
Very Important: N=20</td><td>Q19. Desired extent of developing vocabulary:
Great Extent: N=18
Some Extent: N=2</td><td>Q20. The ability to learn a particular number of new words per day:</td></tr>
</table>

Somehow Important: N=0		2-3 new words: N=2, 4-5 new words: N=14, 6-7 new words: N=3, 8+ new words: N=1

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Appendix 2. Individual record of progress made by participants (pre and post-test results of Stage 1 and Stage 2)

Quantitative evidence (Pre-tests and Post-tests), supporting qualitative data (Interviews, diary, logbook)

Remarks / Comments made by the participants / Reasons (based on Interview, diary and logbook quotes):

Italicised: Direct participants' quotes / Non-italicised: Researcher notes			** (Installed app) / ** (Socialising apps)*	
P. No #	*Knowledge of target words prior to the study*	*Knowledge of target words after the study*	*Knowledge of target words prior to the study*	*Knowledge of target words after the study*
1	105 / *200 (Installed App)*	96 * /200 *(Installed App)*	75 / *200 (Socialising Apps)*	125 ** (25% increase)
* *"Why use dictionary if I know English meaning"* Did not attempt to learn from Installed app. *"The app in my phone kept freezing"* ***(Interview)*** | ** First time to learn with socializing apps and felt satisfied, *"I like spending time on my phone"* ***(Interview)***				
2	159 / *200 (Installed App)*	173 * (7% increase)	101 / *200 (Socialising Apps)*	143 ** (21% increase)
* Likes L1 translation ***(Interview)*** | ** Wished all English language dictionaries came with images. ***(Logbook)***				
3	64 / *200 (Installed App)*	70 * (3% increase)*	80 / *200 (Socialising Apps)*	62 **
* *"Learning is boring"* (Diary) | ** *"I'm going to mute notification on my phone"* (Diary)				
4	107 / *200 (Installed App)*	113 * (3% increase)	30 / *200 (Socialising Apps)*	102 ** (36% increase)
* *"The installed app is too boring to learn from"*. ***(Logbook)*** | **Enjoyed learning with socialising apps + sticky notes. ***(Interview)***				
5	0* / *200 (Installed App)*	81 / *200 (Installed App)*	40 / *200 (Socialising Apps)*	139 ** (49.5% increase)
* Absent on test day and refused to reset | ** Perceived the socializing apps to be very effective alongside L1 translation. Also believes in immersion *"Communication with native speaker"* ***(Interview)***				
6	124 / *200 (Installed App)*	0 * / *200 (Installed App)*	40 / *200 (Socialising Apps)*	174** (67% increase)
* Learning not attempted (Diary) | ** *"If I become a teacher one day, I will also teach in WhatsApp or Telegram"* (Diary)				
7	133 / *200 (Installed App)*	177 * (22% increase)	59 / *200 (Socialising Apps)*	125 ** (33% increase)
* *"I match the words to my friends"* (Diary) | ** *"I love the photos and the images, it makes learning fast"* (Diary) *"I liked the pictures and pronunciation"* ***(Interview)***				
8	65 / *200 (Installed App)*	82 * (8.5% increase)	116 / *200 (Socialising Apps)*	197 ** (40.5% increase)
* *"Phone keeps jamming and freezing"* ***(Logbook)*** | ** *"I enjoy learning in a group with my friends"* , *"There was a competition, I like learning in group than learning alone"* ***(Interview)***				

9	110 / *200 (Installed App)*	132 * (11%)	64 / *200 (Socialising Apps)*	194** (65% increase)
* *"I voice record the new words in my phone and listen to it"* (Diary) | ** *"I like the pictures and forward the messages to my friends"* (Diary) *"I loved the pictures and learning in group"* ***(Interview)***				
10	117 / *200 (Installed App)*	130 * (6.5% increase)	50 / *200 (Socialising Apps)*	192** (71% increase)
* Hasn't opened the app after installing it, as he knew most of the words already ***(Logbook)*** | ** Combined modern, traditional and individual learning approaches. *"I learn better with pictures and I learned in a new and interesting way with apps"* ***(Interview)***				
11	74 / *200 (Installed App)*	80 * (3% increase)	69 / *200 (Socialising Apps)*	110 ** (20.5% increase)
* Did not bother learning from installed app. ***(Interview)*** | ** Would like to learn more words in short time. ***(Logbook)*** *"Socialising apps are easy to use and understand, they are popular"* ***(Interview)***				
12	111 / *200 (Installed App)*	116 * (2.5% increase)	68 / *200 (Socialising Apps)*	158 ** (45% increase)
* Definitions are difficult to understand, plus no example sentences ***(Logbook)*** | ** Example sentences help to learn more. ***(Logbook)*** *"I can share my learning with others"* ***(Interview)***				
13	100 / *200 (Installed App)*	126 * (13% increase)	46 / *200 (Socialising Apps)*	170** (62% increase)
* *"I don't need to learn all words"* (Diary) | ** *"I record my voice and learn better with the pictures"* (Diary) Always online and active learner ***(Logbook)***, *"Who doesn't learn with technology anyway", "I save words with photos in media and access later", "Able to learn a fixed number of words, not a whole list", "Appreciate the teacher's hard job and teaching with love"* ***(Interview)***				
14	110 / *200 (Installed App)*	111 * (0.5% increase)	60 / *200 (Socialising Apps)*	105 ** (22.5% increase)
* Negative facial expression witnessed about the app *"They are useful but they take memory of my phone"* ***(Logbook)*** Learns with sticky notes*: "I am able to read and revise with sticky notes without planning, even when cooking"* ***(Interview)*** ** Recalling learnt words in the classroom and taking pride in his verbosity, ***(Logbook)***				
15	114 / *200 (Installed App)*	117 * (1.5% increase)	66 / *200 (Socialising Apps)*	102 ** (18% increase)
* Not brought up with learning with phones or technology. *"Technology is complicated and expensive"* ***(Interview)*** ** Forwarded and taught the new words to friends although didn't like the notification tone *"The messages and messaging tone kept distracting and disturbing me", "Real learning with real teacher"* This participant learns better with videos. *"Improves listening and reading and pronunciation", "You can pause video to copy the new words"* ***(Interview)***				
16	64 / *200 (Installed App)*	0* / *200 (Installed App)*	70 / *200 (Socialising Apps)*	76 ** (3% increase)
* Refused post-tests as no learning was attempted. ***(Interview)*** | ** Wants to learn to please the teacher ***(Logbook),*** Enjoys learning with sticky notes and relies on L1 translation: *"I like*				

to learn new words on the wall, old words in bin", "Lack of technological resources in home country", "I need to know the meaning in my first language" ***(Interview)***				
17	102 / *200 (Installed App)*	104 * (1% increase)	57 / *200 (Socialising Apps)*	94 ** (18% increase)
* Not accustomed with learning with installed apps. *"Installed app was boring, didn't even open the app, the meanings in installed app were more difficult than the actual word"* ***(Interview)*** | ***"I like learning with videos and images"*** ***(Interview)***				
18	98 / *200 (Installed App)*	123 * (12.5% increase)	53 / *200 (Socialising Apps)*	170 ** (58.5% increase)
* Used voice recording for practice and revision. Enjoys watching videos *"Watching videos solves understanding different accents problems"* ***(Interview)*** | ** Combined traditional and modern learning approaches and relies on L1 translation. *"I like to send emojies and photos", "Fun and interesting", "I can not understand English to English translation"* ***(Interview)***				
19	101 / *200 (Installed App)*	0* / *200 (Installed App)*	91 / *200 (Socialising Apps)*	97 ** (7% increase)
Supports traditional learning approaches: **"Writing the new words 10 times followed by memorization and translation into first language", "Dictionaries are expensive to install"* ***(Interview)*** | ** *"Phones are for talking and chatting, not learning"* ***(Interview)***				
20	172 / *200 (Installed App)*	0* / *200 (Installed App)*	83 / *200 (Socialising Apps)*	124 ** (20.5% increase)
* *"Words in the packages are not IELTS level", "Problem with phone memory, uninstalling and reinstalling the apps"* ***(Logbook)*** | ** Supports traditional learning approaches: *"I like sticky notes, learning with friends and comparing meaning in my first language", "Real feeling of learning by touching your books and sticky notes", "Lost my phone and lost all messages and apps"* ***(Interview)***				