The Effect of Mobile-Assisted CEFR English Vocabulary Profile Word Lists on L2 Students' Vocabulary Knowledge

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Abstract: The objective of the study was to examine the effect of mobile-assisted vocabulary learning using the Common European Framework of Reference for Languages (CEFR) English Vocabulary Profile word lists on L2 students' vocabulary knowledge at a university in Pakistan. A quasi-experimental study was conducted with sixty samples divided into the experimental (n=30) and control (n=30) groups. The treatment for the experimental group comprised ten weeks of mobile-assisted vocabulary input from the chosen word lists. The Vocabulary Size Test (Nation & Beglar, 2007) was administered as pre-test and post-test to measure the impact of the word lists. Results from the independent *t-test* showed a significant effect of the treatment on the experimental group, and improvement was observed in the mean score. When the post-test mean scores of the control and experimental groups were compared, findings indicated that there was a difference in the mean scores and the mean difference between groups was significant. The primary conclusion of this study is that the mobile-assisted vocabulary input did significantly help improve the experimental group's mean score, illustrating its impact on the group's vocabulary knowledge. This, essentially, points to the fact that this method for vocabulary learning can be recommended for L2 learners and may be used to improve their vocabulary in line with the CEFR levels.

Keywords: CEFR, mobile-assisted, vocabulary, EVP, wordlist

1.   Introduction

Vocabulary is a fundamental component of learning any language, particularly as a second or foreign language, and plays an essential role in academic achievement (Schmitt & Schmitt, 2020; Stoffelsma, Spooren, Mwinlaaru, & Antwi, 2020). Having insufficient vocabulary can be a significant problem for learning a language, especially when students encounter subject-specific vocabulary such as in engineering or medicine (Uchihara & Harada, 2018). In addition, Ali et al. (2012) argues that possessing a sizable vocabulary knowledge enable language learners to comprehend what they read or hear, which are crucial academic skills. Thus, having good vocabulary knowledge is an effective tool in learning a language and for academic success.

In line with this, the Common European Framework of Reference for Languages (CEFR; Council of Europe, 2001) has introduced the English Vocabulary Profile (EVP) that classifies vocabulary according to the six CEFR levels. EVP is built on the CEFR can-do philosophy that

emphasises what learners already know rather than what they should know (Capel, 2012). EVP word lists outline not only the vocabulary but also the individual meaning of each word and phrase. It can be used as an instrument that suggests the vocabulary size that learners need to learn to improve their vocabulary knowledge and language proficiency from one level to the next. For example, 784 base vocabulary is listed as frequency words to gain proficiency of level A1 and corresponding numbers of frequency words for the other five levels are also included (Table 1). EVP has been used in several studies and is a valuable online vocabulary resource for instructors, teacher trainers, test setters, materials developers, and syllabus designers (Sun, 2017; Capel, 2012; Owen et al., 2021; Usami, 2019).

Table 1. The Number of Vocabulary Words according to Level in the EVP

Level	No of Vocabulary words
C2	3807
C1	2140
B2	4164
B1	2937
A2	1594
A1	784

2. Problem Statement

One of the difficulties which learners, whose first language is not English, face with language learning is vocabulary learning and this may hamper their language acquisition process (Farooq et al., 2020). Some researchers have indicated that when L2 learners lack vocabulary, they will also lack reading, listening, speaking and writing skills (Fareed et al., 2018; Farooq et al., 2020). Thus, having extensive vocabulary knowledge is fundamental to learning a language and language learners need to be given appropriate exposure to a variety of vocabulary (Nurdiansyah et al., 2019). However, learning vocabulary is a time-consuming process that requires the learners to master the form and the range of meanings of a specific lexical word. To resolve this problem, different approaches to learning and teaching vocabulary have been introduced and used to different effects. There are two popular vocabulary-learning approaches, which are intentional and incidental vocabulary learning and teaching (Alemi & Tayebi, 2011). The former, grounded in Behaviorist learning theory, fosters a direct learning approach of the vocabulary words (Webb, 2019), for example memorizing words and their meaning. Whereas the latter emphasises the cognitive process in which learning is a goal (Bereiter & Scardamalia, 2018; Zhang & Wu, 2019), for instance learning words through guessing at the context or definitions (Nation, 2001).

One of the methods of intentional vocabulary learning is using word lists (Burkett, 2017; Schmit & Schmit, 2020). Word lists are created and used to help ease vocabulary learning through guiding the teaching and learning of vocabulary in the language classroom with the adoption of word lists. Common vocabulary items that appear regularly across various texts may be found in vocabulary word lists and are aimed to enhance learners' comprehension of any language text that they encounter such as reading texts and written instructions (Durrant, 2016). Schmitt and Schmitt (2020) underline that word lists should lie at the heart of a good vocabulary course design and vocabulary test development because it helps in vocabulary acquisition and evaluation. Several studies have also proven that vocabulary word lists are suitable sources to enhance the teaching and learning of vocabulary (Schmitt & chmitt, 2020). Having said that, vocabulary learning and teaching remain a problem (Joyce, 2018). Burkett (2017) found that the main problem of vocabulary learning is that instructors do not use the word lists in their classrooms as usable material, mainly due to lack of classroom time. Thus, taking into consideration that the use of word lists may be beneficial to language learning, a solution to overcome the problem

faced by students and instructors with time constraints for vocabulary learning has to be explored. Perhaps, a possible solution is through the adoption of mobile devices, which can encourage the use of word lists for vocabulary learning and overcome time constraints.

Technology, specifically mobile-assisted technology, may have a place in facilitating vocabulary learning. Mobile-assisted vocabulary learning can be embedded within a curriculum (Gürkan, 2018), which specifically adopts the intentional approach through the use of vocabulary word lists (Zhang & Wu, 2019). Word lists can be used and explored through an appropriate mobile device to enhance vocabulary learning. In addition, mobile-assisted vocabulary learning potentially provides a flexible mechanism for drill and practice and a platform for vocabulary learning to complement classroom learning (Burkett, 2015). A number of studies have shown that mobile-assisted vocabulary learning and teaching is beneficial as it saves time in the class and vocabulary can be learned anywhere and at any time (Alemi et al., 2012; Basal et al., 2016; Mahdi, 2018; Bensalem, 2018). However, more studies are needed to delve into the potential of mobile-assisted vocabulary learning when word lists are used. Therefore, this study aims to fill this gap by examining the effects of using a mobile device and CEFR EVP, a rarely explored wordlist (Sun, 2017; Owen, Shrestha, & Bax, 2021; Usami, 2019), on L2 'students' vocabulary learning. The effects are investigated through an analysis of the L2 students' vocabulary knowledge development.

2.1   Research Objective

This study examines the effects of mobile-assisted CEFR EVP word lists on L2 learners' vocabulary knowledge.

2.2   Research Questions

This study is designed to answer the following research questions:

1.   Does the use of mobile-assisted CEFR EVP word lists affect the vocabulary knowledge of L2 students?
2.   Is there a significant difference in the post-test scores of the control and experimental groups?

3.   Literature Review

3.1   Vocabulary Learning

Two theories of vocabulary learning are intentional and incidental learning (Leow & Zamora, 2017). It is generally understood that incidental learning happens when vocabulary is put in context (Nation, 2001) and is described as acquiring vocabulary as a by-product of any action that is not prepared for merely lexical acquisition (Ender, 2016). This vocabulary learning method often entails reading, talking, and listening to stories, movies, television, or the radio. Nation (2001) also stated that incidental vocabulary learning might not deliberately include learning words but learning them within the context. Thus, it is the most important source of vocabulary learning (Bereiter, & Scardamalia, 2018). However, one downside of this type of learning is that learning depends on factors like the type of text material and the capacities of the learner (Poór et al., 2020). Success depends on the capacity of the learner to understand the proportion of words, which he already knows in a piece of text, and guess at unfamiliar words (Nation, 2001). For incidental vocabulary learning to be successful, learners should first be aware of much of the content of the text to use the clues for guessing at unknown words. On the other hand, intentional learning refers to cognitive processes in which learning is a goal rather than a consequence (Bereiter, & Scardamalia, 2018). This approach to learning vocabulary stimulates engagement and feedback, in which students become aware of their learning process and may utilise tools and techniques to improve it (Nation, 2001). Nation (2001) stressed that each type of learning is suitable for different learning phases: intentional learning that involves learning words and their definitions is essential, especially at the initial stage of vocabulary learning. In contrast, incidental learning is best adopted when a learner has already acquired a degree of vocabulary to facilitate guessing

unfamiliar words. Therefore, the instructor must know which stage of vocabulary learning the learners are at to use the most appropriate vocabulary teaching approach.

Using word lists for vocabulary learning is an example of intentional learning (Thompson, & Alzeer, 2019). A wordlist is a list of a language's lexicon sorted by frequency of occurrence either by levels or as a ranked list within some given text corpus. Schmitt and Schmitt (2020) observed that 67% of the school and 50% of the university students in their study used word lists to learn vocabulary. Many word lists are available such as "A University Wordlist" (Xue & Nation, 1984), "A General Service List of English Words" (as cited in West, 1965) and Academic Wordlist (AWL) (Coxhead, 2000) to name a few. Banister (2016) added that the Academic Wordlist (AWL) is also widely used by teachers of academic English, both as a guide for the course and materials design and an instrument recommended for self-study. Alemi et al. (2012) conducted a quasi-experimental study. They used 320 mobile-assisted headwords from AWL, and the results concluded that teaching vocabulary using a wordlist, especially via mobile phones, was an effective approach to increase students' vocabulary knowledge. In another study, Lin and Yu, (2017) also taught using mobile-assisted word lists from textbooks and found that the students favoured teaching vocabulary items.

Vocabulary proficiency levels are critical for understanding language use (Viera, 2017). The depth of vocabulary knowledge relates to how thoroughly words of the target language are known. Developing vocabulary depth usually includes the accumulation of knowledge via encountering and using words in various situations to understand the forms, meanings, and uses of words (Webb, 2012). In contrast, vocabulary size refers to the number of words a learner knows (Staehr, 2008). CEFR suggests that there should be an increment in vocabulary size as learners go from A1 to C2, as shown in the EVP (Amenta et al., 2021). (Nation. P, personal communication, ; June 16, 2021) also suggested the vocabulary size following each CEFR proficiency level (Table 2). Based on his interpretation, he claims that if a learner's vocabulary is between 7000-9000 words, he should be considered at level C2 of the CEFR scale. The difference between Nation's suggested list and the EVP illustrated in Table 1 is the number of vocabulary words each table suggests for each CEFR level. Table 2 itemises some of the types of vocabulary included for each level; for instance, level A1 words should originate from the survival vocabulary. However, both are aimed at illustrating the vocabulary size of each level, with Nation sometimes indicating the vocabulary depth of each CEFR level.

Table 2. English Vocabulary Profile Wordlist

Level	Can-Do Statements	Nation's Test of word size equivalent to CEFR Level
C2	Can use idiomatic expressions and colloquialisms and shows awareness of connotative levels of meaning.	7000-9000 words
C1	Uses lexical repertoire; little obvious searching for expressions and has command of idiomatic expressions and colloquialisms.	5000-6000 words
B2	Has a good range of vocabulary for most general topics and can vary formulation to avoid frequent repetition, but lexical gaps can still cause hesitation and circumlocution.	4000 words (2000-3000 high frequency words plus 000-2000 relevant technical vocabulary)
B1	Has a sufficient vocabulary to express him/herself and can describe family, hobbies and interests, work, travel, and current events.	2000-3000 high-frequency words
A2	Has a sufficient vocabulary for the expression of basic communicative needs. Has a sufficient vocabulary for coping with simple survival needs.	The most frequent 1000 word families

| A1 | Has a basic vocabulary repertoire | 120 words and phrases from the survival vocabulary* |

Nation (personal communication, June 16, 2021

3.2   Mobile-Assisted Vocabulary Learning

Mobile learning, also known as m-Learning, is often linked to the use of mobile technology, particularly the mobile phone for learning and teaching purposes (Rahamat et al., 2017; Grant,2019). It had only been about a decade since mobile technology was first launched worldwide in the field of English language instruction, but Hussin et al. (2012) cautioned that the main emphasis of Mobile - Assisted Language Learning (MALL) should be on the learning itself rather than the technology represented by the technology. Thus, the output of MALL is more important than the mobile tool that is in use.

Many researchers have started to study language acquisition utilising different mobile technologies (Kim et al., 2013), for grammar, listening, speaking (Kim et al., 2013) and even vocabulary learning (Kim et al., 2013), in both formal and casual contexts (Kim et al., 2013). In relation to vocabulary learning, the usage of mobile technology has been useful for teaching vocabulary (Jasrial, 2019; Wijayanti & Gunawan, 2018) and is an option to increase students' interest. In addition, using tutorials or tailored mobile applications to study vocabulary has the potential to either improve word memory or boost learners' interest in vocabulary learning (Lin & Lin, 2019). Basal et al., (2016) conducted a four-week study to compare and assess the efficacy of a mobile device for teaching vocabulary words from figurative idioms of the Michigan Corpus of Academic Spoken English (MICASE) corpus to traditional activities. The findings confirmed the usefulness of the mobile application employed in this study for learning idioms. Evidently, even though there are studies that have looked at mobile-assisted vocabulary learning, few studies have utilised MALL with CEFR wordlists (Ebadi & Bashiri, 2018). In addition, the combinations are seldom properly scrutinised (Deygers, 2019). Therefore, this study aims to observe the effects of mobile-assisted CEFR EVP word lists on L2 learners' vocabulary knowledge.

4.   Methodology

A quasi-experimental design was used for this study, which is well suited for intact and commonly formed groups (Révész & Roger 2019). Due to limited access to the population, the research was conducted on samples where access and permission were granted to collect data. In order to minimise the threat to the research design, the researchers ensured that the participants were homogenous groups and their entry test results at the university reflected their homogeneity in terms of their level of English language proficiency. In addition, because the research is aimed at looking at a specific effect (i.e. the word lists) the main concern was to estimate the outcome of the intervention on an acceptably large sample size to strongly estimate an experimental effect size (Klar & Leeper, 2019), in which the sample size in this study has achieved and thus the sampling method is adequate. The sample was divided into two groups: the treatment and control groups. Intervention or treatment in mobile-assisted vocabulary learning was provided to the treatment group as a measure to investigate its impact on the learners' vocabulary knowledge (Ranganathan et al., 2016). A pre-test and post-test were administered to both groups at the beginning and the end of the   study (Azhar, & Jalil, 2022). Nation and Beglar's (2007) Vocabulary Size Test (VST) was used as a pre-test and post-test instruments. Before conducting the study, the VST was measured in relation to the EVP scale using Text Inspector as a scale to measure the relevance of the vocabulary in VST with CEFR. It was calculated that the test has 59% relevance EVP. This means that more than half of the test was based on the vocabulary items in the EVP wordlist and its proficiency level of the test is at C1 on the CEFR profile. After the relevance was determined and the level identified, it was decided that the EVP wordlist and VST can both be used for the intervention. The results are indicated in the following figure (Fig. 1).

Fig. 1 CEFR level of the VST (Nation & Beglar, 2007)

4.1   Sample of the study

First-year students majoring in Bachelor of English Language and Literature at a university in Pakistan were selected as samples of the study (n = 60). Thirty students were put in the experimental group, while the remaining 30 were control group samples. This course was chosen because the students in the new semester are generally homogeneous in their proficiency level, reflecting on their vocabulary knowledge. The students' ages ranged between 17 to 22 years old, and 76.6.% were male, while the remaining 23.4 % were female students in the experimental group. As for the control group, there were 83.3% male and 16.7% female students. Table 3 below presents the demographic variables.

Table 3. Demographic data of the participants

Groups	Male	Female	Age
Experimental	23 (76.7%)	7 (23.33%)	17-22
Control	25 (83.33%)	5 (16.66%)	17-22

Table 4 demonstrates the age range of the participants in the study.

Table 4. Age range of the participants in the experimental and control groups

Age in Years	17y -19y		20y – 22y	
Groups	Experimental	Control	Experimental	Control
Male	15	15	8	10
Female	2	2	5	3

Purposive sampling was chosen as the sampling method due to the limited access the researchers were given to the sample. Purposive sampling is a sampling method in which the samples are chosen based on the purpose of the study (Etikan, & Bala, 2017). Hasanah et al., (2022) conducted a similar quasi-experimental study to evaluate the impact of using a guessing game technique to learn

vocabulary. They also used the purposive sampling technique to choose experimental and control groups participants. Musdalifah and Romdaniya (2022) also used the purposive sampling technique in a quasi-experimental study, where they discussed the impact of vocabulary learning games on female students. Other studies also witness the use of the purposive sampling technique in similar studies using the same quasi-experimental design (Rahman et al., 2016; Novayanti et al., 2018). Due to the sampling method, the sample may not represent the whole population, and therefore, generalisations of the findings should be tentatively made (Battaglia, 2008). However, as mentioned earlier in the paper, the objective of the study is to investigate the impact of mobile-assisted vocabulary learning mainly for future adoption of this approach for vocabulary learning and teaching in the L2 classroom.

4.2   Instruments

The vocabulary size of the sample was measured using the Vocabulary Size Test (VST) (Nation & Beglar, 2007) as a pre-test and post-test (Kök, & Canbay, 2011). VST is a famous test based on estimations of word family frequency generated from the British National Corpus (BNC) (Nation, 2006). Language learners are expected to have some control over word-building devices and can discern a formal and semantic link between regular derivatives of a word family and this test can facilitate in measuring this (Nation & Beglar, 2007). This test has been widely used to measure vocabulary size in various studies (Le Thi Cam Nguyen, & Nation, 2011; Coxhead et al., 2015). The reliability of the test has also been measured based on Rasch reliability indices and has been found to have a high reliability of > 0.96 (Beglar, 2010). A number of studies have also used VST and found it to be a reliable test for measuring vocabulary size (Zhang, 2013; McLean et al., 2014; Fukuda, Yoshimuta, & Tsuneyasu, 2019). For the reason of its high reliability, VST was chosen as the main data collection instrument of this study.

VST has 140 test items which are divided into 14 lists and based on the fourteen 1000 frequency word lists from the British National Corpus (BNC) (Nation, 2012). The lists include words chosen from the first 1000 wordlist to the 14th 1000 word lists from the BNC 10 million tokens (Nation, 2006). List 1 in the BNC is composed of high-frequency words and the frequency level decreases as the list number increases, for instance, List 1 contains more high-frequency words than list 14. The 10 test items in each of the 14 lists represent 10% of each of the 1000 word lists. As mentioned earlier, when the test was measured on the Text Inspector the score of the VST on the English Vocabulary Profile was 59% which means there was a relatively strong relationship between the VST and CEFR EVP word lists used. The scores of the participants of the study may indicate how much the mobile-assisted CEFR EVP word lists used affects the development of their vocabulary knowledge. To calculate the VST scores, each participants' total score in the test is multiplied by 100 to get at their vocabulary size.

4.3   Data Collection Procedure

The study was conducted over twelve weeks, the same study duration as another study (Alemi et al., 2012) and is a suitable duration because of the 14-week semester system the students were undergoing. A pre-test was conducted during the second week of the study, while the post-test was during the last week. The pre-test results at the beginning of the study helped determine the overall level of vocabulary according to the CEFR EVP for both groups. In this way the intervention was targeted at the CEFR level the students were at plus a level above. According to Laosrirattanachai and Ruangjaroon (2021) as well as Banister (2016), an efficient method to investigate the growth in vocabulary knowledge is via the intervention of two-word lists, one at the present competence and another at a higher level. This approach was adopted for the intervention in this study. What this means is that, since the pre-test mean scores of both the control and experimental groups were 69, and according to Nation and Beglar's (2007) calculation, a 6900 vocabulary size should be considered for the intervention. When this score was measured according to Nation's proposal of equating vocabulary knowledge to CEFR EVP (see Table 2), it was considered that the total vocabulary size of the groups was equal to the C1 level. Once this was determined, the intervention consisted of 250 vocabulary items from the EVP C1 word list, and the other 250 were from the C2 wordlist. The vocabulary items were provided as mobile-

assisted vocabulary input and a sample of words from the two-word lists as used in the study is in Table 5.

Table 5. Sample Weekly Mobile-Assisted Vocabulary Input

	C1	C2
First week's words	Albeit Narrative Lad Inhabit	Mount Nest Oddly Pole

The intervention was conducted over a ten-week period, which started from week two until week eleven of the study using the mobile application *Whatsapp*, which is a commonly used application for communication among students and instructors. The intervention was given to the experimental group and at the same time, the control group continued to undergo English language classes as usual. Each intervention was in the form of mobile-assisted vocabulary input, whereby ten vocabulary items from the CEFR EVP word lists were sent per day for 5 days each week to the experimental group participants. In total, 500 words were sent throughout the intervention period. A sample of the mobile-assisted vocabulary input is shown in Figure 2.
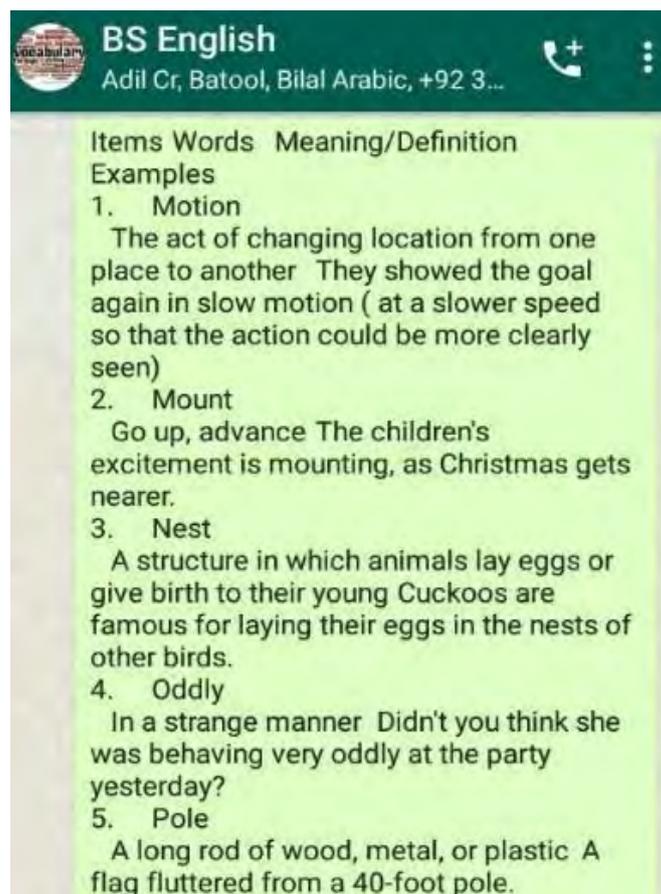

Fig. 2 Sample Mobile-assisted Vocabulary Input

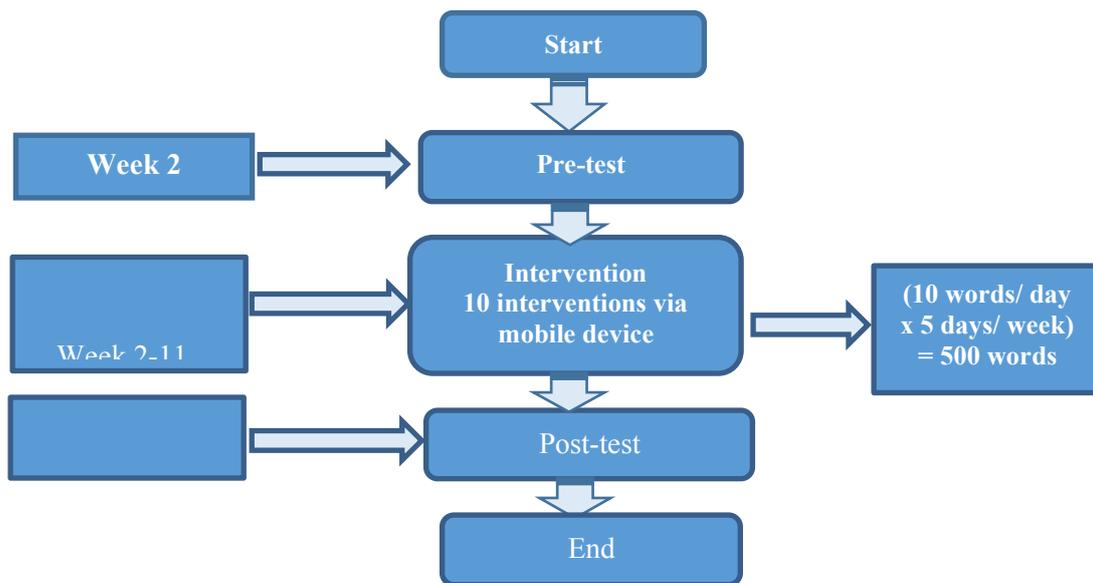Figure 3 illustrates in detail the procedures of the study.

Fig. 3 Research procedures

4.4   Data Analysis

Scores from the VST pre-test and post-test were calculated for descriptive analysis such as frequency, mean and standard deviations. Yusuf (2017) also used descriptive and inferential statistics in a quasi-experimental study on vocabulary instructions, where the researcher employed pre-test and post-test to evaluate the impact of vocabulary on reading comprehension. The test is based on 140 multiple-choice questions and scores were calculated by counting the correct options in the test and multiplied by ten for the total vocabulary size. Then, a *t-test*, one of the most commonly used methods to evaluate the differences within and between groups, was run to see if there were significant improvements in the students' vocabulary knowledge (Gravette & Wallnau, 2016). The test results from the pre-test and post-test were compared for within and between group differences (Emerson, 2017). The data was analysed statistically (Abdullah et al., 2021) using Statistical Packages for the Social Sciences (SPSS) (Abbasnasab Sardareh et al., 2021).

5.   Results & Discussion

5.1   Impact of Mobile-assisted CEFR EVP word lists on L2 students' Vocabulary Knowledge

The pre-test mean score of the experimental group was 69.76 (SD = 11.26) and the control group mean score was 69.73 (SD = 12.09). The results of the pre-test mean scores demonstrate that there was only a slight difference between the groups, with the experimental group having a slightly higher score at the initial part of the study. At post-test, the mean score of the experimental group was 83.47 (SD = 11.09), while the score of the control group was 72.60 (SD = 18.20). This indicates two main findings which are one, both groups showed some improvement over time in the post-test; the experimental group fared better with a mean difference of 13.7 and the control group only had a difference of 2.87 from the pre-test scores. Two, when the experimental and control group scores were compared there was a mean difference of 10.87 in the post-test scores of the two groups when there was only a slight difference (0.04) in the pre-test scores (Table 6).

Table 6. Pre-test and Post-Test Mean Scores of the Experimental and Control Groups

Groups	Pre-test Mean Score	Post-test Mean Score	Mean Difference (within-group)
Experimental	69.77	83.47	13.7
Control	69.73	72.60	2.87
Mean Difference (between groups)	0.04	10.87	

As a measure to examine if the findings were significant, *t-tests* were carried out. The *t-test* results showed that there was a significant effect of the treatment on the experimental group. The post-test mean scores of the control and experimental groups were compared and the findings from the *t-test* indicate that there was a significant difference in the mean scores between the two groups; m = 10.867, p = .007 (p < .05 two-tailed sig) (Table 7). These values demonstrate that the intervention facilitated the experimental group in getting a higher mean than the control group in the post-test and the difference recorded was statistically significant.

Table 7. Independent Samples *t-test* on the Mean Score of Post-test for The Experimental Group and Control Group

Group	n	Mean Score	Mean difference	Sig. (2-tailed)	Standard deviation
Experimental	30	83.47	10.867	0.007	18.200
Control	30	72.60			11.085

In addition, a paired samples *t-test* on the experimental group's pre-test and post-test mean scores also showed that there was a significant improvement in the mean scores between the two tests for the same group (m = 13.70, p = .001 (p < .05 two-tailed sig) (Table 8). The findings showed that the experimental group's mean score improved after the mobile-assisted CEFR EVP word lists intervention, indicating a significant improvement in the students' total vocabulary size and the development in their vocabulary knowledge. The research findings are consistent with the findings of Alemi et al. (2012), who performed a quasi-experimental study to emphasise the usefulness of academic word lists for university students in Iran. The research attempted to assess the impact of SMS on the vocabulary acquisition and retention of university students. Students in the experimental group received the intervention, whereas those in the control group learned the same vocabulary by consulting a dictionary. The delayed post-test results revealed that SMS had a more substantial impact on vocabulary memory than reading a dictionary, and the experimental group outperformed the control group. There are several other studies whose results are also in line with the current study (Basal et al., 2016; Bin-Hady & Al-Tamimi, 2021; Chen et al., 2019; Deris & Shukor, 2019).

Table 8. Paired Samples *t-test* on the Mean Score of Pre-test and Post-test for the Experimental Group.

			Paired differences					
Pair 1	Pre-test mean score	Posttest mean score	Mean	Standard deviation	Standard error mean	T	df	Sig. (2-tailed
	69.77	83.47	-13.70	21.019	3.83	-3.57	29	.001

5.2 Impact of Mobile-assisted CEFR EVP Word lists on the Different Lists in the VST

The post-test mean scores of both the control and experimental groups were also compared according to the 14 lists (Table 9). The results indicate that there was a mean difference between the two groups in all 14 lists and the experimental group scores showed a higher mean improvement. However, significant improvements ($p < 0.005$) on Lists 7, 8, 9, 11 and 13 were observed with mean differences between 1.1 to 2.4: List 7 and 8 ($p =.00$), List 9 ($p = .04$), List 11 ($p = .020$) and List 13 ($p = .002$). This demonstrates that the intervention showed more significant effects on some of the lower frequency word lists than the higher frequency words lists. The significant findings for 5 of the 14 lists illustrates the effectiveness of the intervention on the students' vocabulary knowledge. Further analysis may be needed to fully understand the results and impact of the intervention.

Table 9. Post-test Mean Scores of Control and Experimental Groups according to the 14 lists in VST

Independent Samples Test

Nation's Vocabulary Test Lists	Std. Deviation		t	Sig. (2-tailed)	Mean Difference
	Post Experimental	Post Control			
List1	1.167	1.172	.662	.510	.200
List2	1.714	1.269	-.685	.496	-.267
List3	1.061	1.398	.728	.470	.233
List4	1.561	2.063	-.706	.483	-.333
List5	2.037	1.599	-.282	.779	-.133
List6	1.929	2.157	.568	.572	.300
List7	2.446	1.642	3.781	.000	2.033

Independent Samples Test

Nation's Vocabulary Test Lists	Std. Deviation		t	Sig. (2-tailed)	Mean Difference
	Post Experimental	Post Control			
List8	1.989	1.493	5.359	.000	2.433
List9	2.150	1.900	2.100	.040	1.100
List10	3.081	1.930	1.155	.253	.767
List11	1.964	1.690	2.396	.020	1.133
List12	2.354	1.383	1.137	.260	.567
List13	2.718	1.192	3.261	.002	1.767
List14	2.776	1.461	1.863	.068	1.067
Total Score	**18.200**	**11.085**	**2.793**	**.007**	**10.867**

The results of the study illustrate the effectiveness of mobile-assisted vocabulary learning. The significant results indicate that it is a valid approach to adopt for the teaching and learning of vocabulary. It also reveals that learning vocabulary through mobile phones bore positive results on the students' vocabulary development even with lower frequency word lists. The significant improvement of the experimental group mean score, either within group or between groups suggests at how significant is the impact of the mobile-assisted CEFR EVP vocabulary learning on the students' vocabulary knowledge. The findings show that utilising mobile-assisted CEFR EVP word lists to improve vocabulary knowledge is successful and this supports the findings of other studies (Alemi et al., 2012; Basal et al., 2016; Wijayanti & Gunawan, 2018; Jasrial, 2019), which also recorded an increase in students' vocabulary knowledge. As for the usage of mobile technology, like in other studies (Jasrial, 2019; Wijayanti & Gunawan, 2018), it has been found to be a beneficial tool for teaching vocabulary (Duong et al., 2021). In addition, the efficacy of a mobile device for teaching vocabulary is proven and the significant findings confirm the practicality of the mobile application in providing a platform for learning vocabulary outside the constraints of class time. Thus, the present study results indicate that using mobile-assisted CEFR EVP word lists for vocabulary learning can facilitate students and instructors who are facing time constraints with the learning and teaching of vocabulary (Burkett, 2017) by complementing classroom learning with mobile-assisted vocabulary learning in which students can access to at any time convenient to them.

The present research showed the usefulness of mobile assisted CEFR vocabulary list for teaching and learning of vocabulary. Even though Burkett (2017) also recommended utilising vocabulary lists, the study proposed employing customised vocabulary lists using a mobile application to provide the vocabulary items to the students. One of the important outcomes of the research was the

establishment of a unique framework for classifying the usage of word lists into four basic categories in the teaching and learning process, which are: course design, materials development, teaching and learning, and assessment. The researchers started out designing the complementary course through the utilisation of a mobile application and specific word lists. The intention was to grant easy access and targeted input. From the results of the pre-test administered to the students, the materials were developed based on the students' current level and the level after it; an efficient method of intervention using word lists (.Laosrirattanachai & Ruangjaroon, 2021; Banister , 2016). Finally, VST was identified as an effective assessment to measure vocabulary learning after the mobile-assisted intervention. The framework proposed through this study can be a method for teachers with time-constraints to teach vocabulary either as a complementary course or self-study.

Thus, the findings of the current study points to the significant effectiveness of utilising a mobile application on L2 students' vocabulary knowledge, and they are also supported by the findings of other studies which confirmed the effectiveness of using a mobile application for teaching vocabulary to students of various proficiency levels (Hao et al., 2019, Jasrial, 2019; Katemba, 2021; Klimova, 2019; Kohnke et al., 2019; Kukulska-Hulme, & Viberg, 2018; Li et al., 2017). The study also highlights the importance of a targeted vocabulary input to enhance vocabulary learning.

6.   Conclusion

This study investigated the effectiveness of mobile-assisted CEFR EVP word lists on L2 students' vocabulary knowledge and found that it was successful in improving the experimental group's vocabulary knowledge not only with high frequency but also low frequency words. The findings underline several significant implications; one of which is the value of incorporating mobile assisted CEFR EVP word lists into the L2 classroom for vocabulary learning. It provides language instructors with a simple tool to assist students in improving their vocabulary knowledge. Due to the fact that students are familiar with using their mobile phones to send and receive texts, they may also employ them to supplement learning. Next, the tool may even help progress vocabulary acquisition towards a learner-centred approach as a kind of self-study and students will become increasingly accountable for their own learning even outside the L2 classroom. Using a mobile device to acquire vocabulary may assist learners in developing and remembering the enormous number of vocabulary items they encounter both inside and outside of the classroom. Furthermore, the results of the study will have a significant effect on the digital pedagogy of vocabulary learning and teaching through exampling how the adoption of an effective mobile technology and applications as well as vocabulary learning approach can benefit the instructors and students. It will significantly impact the underdeveloped areas of vocabulary learning in particular in the use of mobile technology to learn and teach vocabulary. Finally, the findings also illustrate how CEFR EVP word lists can be used to enhance vocabulary learning in tandem with the CEFR levels in the language, specifically L2 classroom. Thus, the benefits of mobile-assisted CEFR EVP vocabulary learning is an approach that can be adopted for successful vocabulary learning   for   L2   students   who   face   time-constraints   to   learn   them   in   the   classroom.

7.   Implications of the Study

There are several implications that can be derived from the study. As an initial study to explore the effectiveness of a learning and teaching approach, further investigations are needed to understand the phenomena better. First of all, within a similar environment the difference between incidental and intentional vocabulary can be explicitly explored. Perhaps this can facilitate understanding the reason behind significant improvements in some lower frequency word lists as observed in this study. Research on different groups of participants using different CEFR EVP word lists may also reap different findings and deepen the understanding on how exactly is the impact of mobile-assisted CEFR EVP on learners' vocabulary learning. Studies conducted over a longer period of time, using different methods and a longer duration would be beneficial to extend the research into the adoption of this learning and teaching approach specifically for the L2 classroom.

In terms of the mobile devices used, exploration into the use of different devices and applications, as well as format and frequency of the vocabulary input may also unearth different data

which can help instructors better plan their classes. In addition, the mobile-assisted CEFR EVP vocabulary input can be fashioned to become a self-study application that complements classroom teaching and open an avenue for vocabulary learning which overcomes the problem of classroom time constraints. Finally, as a major consideration of any research on MALL the focus should be on the language learning rather than the tool adopted. Therefore, more research on mobile-assisted CEFR EVP vocabulary input on vocabulary knowledge, size and depth would help extend the knowledge on not only MALL but CEFR EVP, which is a relatively new area for exploration in L2 contexts then just adopting CEFR in their curriculum.

## 8.	Acknowledgement:

## 9.	References

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