Whatsapp And An Academic Wordlist (AWL) Have A Synergistic Impact On L2 Vocabulary Learners

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Abstract
Vocabulary development is one of the most important aspects of second language acquisition. The objective of the study was to examine the effects of vocabulary learning through WhatsApp on L2 students’ vocabulary knowledge at a university in Pakistan. Academic Wordlist (AWL) was used for the treatment of the experimental group. A quasi-experimental study was conducted with sixty participants divided into the experimental (n=30) and control (n=30) groups. The treatment for the experimental group comprised 10 weeks of WhatsApp vocabulary input from the chosen word lists. The data collection instrument was the words associates test developed by Read (1993) and was administered as pre-test and post-test. The independent t-test showed a significant treatment effect 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; control group M = 72.10 (SD = 10.93), Experimental Group M= 84.26 (SD = 10.53)
mean the difference between groups (M = 12.16, p < .05). The primary conclusion of this study is that the WhatsApp vocabulary input did significantly help improve the experimental group’s mean score, illustrating the impact of the WhatsApp vocabulary input on the group’s vocabulary knowledge. This, essentially, points to the fact that this method for vocabulary learning may be recommended for L2 learners and may be used to improve their vocabulary in line with the AWL.

**Keywords:** Vocabulary, WhatsApp, AWL, WAT

### 1. **INTRODUCTION**

The social constructivist learning theory aims to enhance students’ social relationships and their ability to create and share knowledge (Vygotsky, 1978). Access to learning materials at any time, in any format, may improve deep learning skills and enable students to build their knowledge (Danker, 2015). The Internet contains a significant quantity of data. The educational resources supplied on websites are typically extremely enlightening and valuable for online learning students in practically every discipline. The Internet assists students in constructing and disseminating their knowledge (Hartshorne & Ajjan, 2009). Online learning communities may use Internet technology to offer mobile learning materials in synchronous or asynchronous modes (Zengin, Arikan & Dogan, 2011). E-learning is intended to provide education to students who are not present in the classroom. It allows students and instructors to access learning materials whether they are separated by time, location, or both (Yilmaz, 2017). E-learning is a relatively new term encompassing many applications, learning processes, and learning techniques (Barhoumi & Rossi, 2013). It consists of a wide range of technical applications, procedures, audio, and video. The node of the e-learning system is the e-learning process created and developed by online instructors (Almaiah, Al-Khasawneh, & Althunibat, 2020).

A well-designed learning environment must allow the user to connect numerous tools in order to produce, share, and improve their level of knowledge utilising a variety of models of learning (Rossi, 2006). Social connections between students engaged in collaborative learning activities are a major factor in the learning process. This kind of knowledge-sharing may be done through mobile devices (Muhonen, Rasku-Puttonen, Pakarinen, Poikkeus & Lerkkanen, 2017). The social interactions between online students serve as the foundation for knowledge construction (Vygotsky, 1978). Learning may also be affected by various factors, such as the learner’s cognitive and psychological condition, the professionalism of the instructor, and the type and complexity of the educational method.

The current research investigates the effect of WhatsApp mobile learning activities on academic performance. It compares those results to students who exclusively get face-to-face education in the classroom. WhatsApp technology offers distant learning opportunities to the new generation. The study believes that the M-learning mode selected
by distance education instructors affects the instructive relationship related to the online instructor’s learning strategy. This research compared WhatsApp learning activities with another procedure in which students are physically present in the classroom while studying vocabulary words from the Academic word list (AWL) Coxhead (2000) in order to fulfil the study’s goals.

Vocabulary instruction is critical to language acquisition. Vocabulary acquisition is one of the challenges for university students whose first language is not English (Faroq, Uzair-Ul-Hassan, & Wahid, 2020). This problem may impede the process of learning a language. According to a few studies (Fareed, Jawed, & Awan, 2018; Farooq, Uzair-Ul-Hassan, & Wahid, 2020), L2 learners who lack English language vocabulary; also lack the other four abilities. Therefore, understanding a range of English vocabulary is one of the essential elements of learning English for language learners (Nurdiansyah, Asyid, & Parmawati, 2019).

Word lists are developed to aid vocabulary acquisition by directing vocabulary teaching and learning in the language classroom. Vocabulary wordlists may assist with this process by including everyday vocabulary items that often occur throughout different books (Carter, 2012). Schmitt and Schmitt (2020) state that word lists should be at the core of effective vocabulary course design and vocabulary test creation. Language practitioners use wordlists to complement their teaching and assessment materials. Several studies have shown that vocabulary word lists are adequate resources for improving vocabulary teaching and learning (Dang, Coxhead, & Webb, 2017). Dang, Coxhead and Webb (2017) performed research in Vietnam to evaluate the vocabulary of experienced L2 instructors. These findings indicate that the BNC/COCA2000 wordlist is the better high-frequency word list for L2 learners. Alemi, Sarab, and Lari (2012) performed quasi-experimental research using mobile phones to teach academic wordlists to university students. The study’s findings revealed that both groups improved in the post-test. Despite the availability of these word lists, acquiring vocabulary remains a challenge (Joyce, 2018; Lin, 2015; Vyatkina & Boulton, 2017). Burkett (2015) discovered that the primary issue with vocabulary acquisition is that instructors do not utilise word lists as helpful material in their classes due to a classroom time shortage. As a result, a solution to the time limitations encountered by students and instructors in vocabulary acquisition must be discovered. Adopting a mobile app, promoting word lists and overcoming time limitations is one potential approach.

Technology, specifically mobile technology, may have a place in facilitating vocabulary learning. WhatsApp vocabulary learning can be embedded within a curriculum (Gürkan, 2018), which adopts the intentional vocabulary learning approach, specifically when vocabulary word lists are used for vocabulary acquisition (Zhang & Wu, 2019). In addition, WhatsApp vocabulary learning potentially provides a flexible mechanism for drill and practice and a platform for vocabulary learning to complement classroom learning (Burkett, 2015). Few studies have shown that WhatsApp vocabulary learning
teaching and learning is beneficial as it saves time in the class, and vocabulary can be learned anywhere and at any time (Jasrial, 2019; Wijayanti & Gunawan, 2018; Bensalem, 2018). However, few studies are available that used Word Associates Test (WAT) as a tool to measure AWL Vocabulary knowledge. Therefore, this study aims to fill this gap by examining the effects of using WhatsApp to teach the Academic word list. The gap is that Read’s Word Associates Test (WAT) has not been used in quasi-experimental studies as a pre-test and post-test. The effects are investigated by analysing the L2 students’ vocabulary knowledge development measuring through WAT.

This study examines WhatsApp's effects on learning AWL vocabulary word lists among L2 learners’ vocabulary knowledge.

The following research questions are the focus of this investigation.
1. How far does the usage of AWL word lists affect the proficiency in the vocabulary of L2 students?
2. Does WhatsApp-assisted AWL vocabulary learning help improve the proficiency level of students’ AWL vocabulary?

2. REVIEW OF THE LITERATURE

2.1 Experimental Background
WhatsApp’s premise is straightforward: send text communications to others through the network without incurring data costs. This app has over 700 million followers and is the world’s most popular messaging network (Milanovic, 2013). WhatsApp has swiftly become the "communication gateway" for social networking, altering the way people interact (Susilo, 2014). As a result, a broad range of mobile devices and desktop PCs has included it (Yeboah & Ewur, 2014). WhatsApp is already being used to teach vocabulary or to deliver general information and language learning. Several studies have been conducted to demonstrate the efficacy of utilising WhatsApp to improve English language acquisition. Alsaleem (2013) sought to investigate the impact of WhatsApp conversation journaling on undergraduate English students’ writing performance regarding vocabulary. Students were taught using WhatsApp electronic journaling is tool to improve writing skills of the students. The two pre-test and post-test writing assignments revealed a substantial increase in writing in terms of word choices. Castrillo, Martín-Monje, and Bárcena (2014) evaluated the impact of WhatsApp in facilitating meaning negotiation amongst 85 Spanish learners of German in another experimental research. Students were split into five WhatsApp groups based on the results of the pre-questionnaire, where they discussed subjects provided by the author. The interactions of students in terms of meaning negotiation and task involvement were studied. Students demonstrated high levels of enthusiasm and engagement, and their meaningful negotiating abilities increased.

The influence of WhatsApp on junior high school EFL students’ vocabulary development
was examined by Jafari and Chalak (2016). A total of 60 students, 30 male and 30 female in Iran participated in the mixed-method group. Both a pre- and a post-test were used in the research. Four English classes were performed, and the experimental group underwent vocabulary instruction via WhatsApp four days a week for four weeks. The traditional method of teaching vocabulary from a textbook was used on the students in the control group. The research revealed that students' use of WhatsApp helped their vocabulary acquisition considerably.

2.2 The Importance of Vocabulary

Like grammar and phonetics, vocabulary is crucial to acquire a new language (Hashemifardnia, Namaziandost & Rahimi Esfahani, 2018). A restricted vocabulary in a second language impedes efficient communication; vocabulary knowledge is frequently viewed as a critical ability for second language learners. Adolphs and Schmitt (2003) emphasised the importance of vocabulary learning, arguing that lexical information is necessary for communicative competence and the acquisition of a second language. According to Susanto (2017), vocabulary knowledge facilitates language use and, conversely, language use leads to the increase in vocabulary knowledge. The usefulness of language is proven everyday both inside and outside of the classroom. Students who thrive in the classroom have a vast vocabulary. Researchers such as O'Dell, Read, and McCarthy (2000) and Gu (2003) revealed that vocabulary acquisition is vital for successful second language use and plays a key role in the production of entire spoken and written texts. All language abilities, such as listening, speaking, reading, and writing in a second language necessitate the learning of vocabulary items (Nation, 2001).

Viera (2017) stated that developing a large vocabulary is essential for effective second language usage since we would be unable to utilise the structures and functions we have acquired for intelligible communication if we do not have a large vocabulary. According to research, second language readers depend significantly on vocabulary knowledge, and a lack of such information is the primary and most important barrier for L2 readers to overcome (Surmanov & Azimova, 2020).

2.3 Assessment of Vocabulary and its Depth

Learning a new language necessitates the acquisition of vocabulary knowledge. More than a few investigations of vocabulary knowledge have been carried out (Lin & Lin, 2019). Milton (2009) addressed the acquisition of vocabulary knowledge and its proper evaluation. Schmitt (2008) spoke about vocabulary knowledge related to the acquisition of new linguistic and cognitive abilities. Research shows that vocabulary knowledge is multidimensional and incorporates many distinct characteristics of word knowledge (Nation, 2001). It is important to be familiar with a word's pronunciation, definition, and context. When it comes to learning, knowledge may be either receptive or productive, active or passive, and tied to the oral or written medium (Nation, 2001). Among the many
conceptualisations of vocabulary knowledge dimensions, one common covers how many words one knows and how well those words are known (González-Fernández & Schmitt, 2020). The former is related to the quantity or breadth of vocabulary knowledge, while the latter is related to vocabulary depth (Dabbagh & Janebi Enayat, 2019). The vocabulary size dimension has received much attention in vocabulary learning and evaluation (Miralpeix & Muñoz, 2018). Words are the building elements of language; this focused attention seems to make sense. As a result, the more words a person learns, the more proficient he or she will be able to understand and utilise a language. This association between vocabulary size and other language abilities, notably comprehension, has been shown in several investigations (e.g., Uchihara & Saito, 2019; Zhang & Lin, 2021), and there is general agreement that lexical coverage must be 98 percent for L2 learners to properly understand a piece of text (Hu & Nation, 2000).

Understanding how words are organised and how word meanings are connected in a learner's lexical repertoire becomes increasingly important as the learner's lexical repertoire grows. This is a vocabulary depth problem. Many words, especially high-frequency words, have many meanings and applications; therefore, concentrating on a single definitional meaning, as is usually used to evaluate vocabulary size, would not reflect the quality of learners’ knowledge of words. On the other hand, researchers believe that concentrating only on the size dimension may be highly limiting (Read, 2004).

2.4 Inquiring into the Depth of the Vocabulary

When one learns more words in L2 learning, such a person will also learn more about those words and their connections. As a result, there is some issue that the simultaneous evolution of size and depth indicates that they are closely linked and may not be separate dimensions (Vermeer 2001). This issue implies that the concept of vocabulary depth will need to be evaluated and verified empirically. A significant difficulty in evaluating vocabulary depth is defining what this dimension of knowledge entails or what particular elements of knowledge depth imply (Milton 2009; Read 2004; Vermeer 2001). According to Read (2004), "vocabulary depth" refers to one's understanding of a word's semantics as well as its orthographies, phonology, morphology, syntactic, collocation, and pragmatic meanings, as opposed to one's knowledge of a word's meaning being only "very imprecise."

2.5 Word Associates Test (WAT)

Read (1993) devised WAT to analyse three vocabulary elements: synonymy, polysemy, and collocation. The bulk of the stimulus words are broad academic descriptions. The test has a KR-20 reliability score of 0.92 (Read, 1993). The split-half reliability of the test was found to be 0.89 in a study conducted by Qian (2002). WAT consists of 50 items. Each WAT item is made up of one stimulus word and six words. Three of the six words are synonymous with one part of or the whole meaning of the stimulus word. The test taker’s
instruction booklet clarifies that in each item, there are always three valid solutions to choose from. This layout significantly minimizes the possibility of guessing. Each properly selected word received one point in scoring. As a result, the highest possible score for the 50 items would be 150 (50 X 3 = 150). When the results of this exam are analysed, they may be used to evaluate one's degree of vocabulary proficiency. He used word association to develop a word associate’s structure, which allows students to choose a stimulus-response pair from a list of options. The WAT is available at the Victoria University of Wellington website: He created a word association’s structure that asks learners to choose answers to a stimulus using word association. The target word and its associates have three primary relationships: “paradigmatic (superordinate, synonyms), syntagmatic (collocates), and analytic (words expressing a crucial aspect of the target word’s meaning)” (Read, 2004, p. 221). The instrument was fine-tuned via repeated piloting. The test is highly linked with L2 reading comprehension ability and has a high internal reliability (Qian, 2002; Read, 1993). Figure 1 describes the sample of the WAT.

![Figure 1. Word Associates Test](http://www.webology.org)

### 2.6 Coxhead’s Academic Word List

There are 570 headwords in AWL, the families of these words are frequently used in the academic texts, that make this list as a “general-purposes academic word list” (Lessard-Clouston 2013) rather than a tool for specific discipline. As stated by Coxhead (2011) AWL covers 10% of the tokens in 3.5 million-word corpus of the academic texts. Vocabulary items in the list are in the form of decreasing frequency sublists and are based on word families.

Learners are said to be able to deduce the meaning of each family member very readily from the base (Bauer & Nation 1993). As a result, the AWL items offer a significant target for vocabulary acquisition in EAP settings to improve text comprehension, which was the main objective of its creator (Coxhead 2011). Several studies and initiatives have used the AWL, which has been hailed as the most representative list of academic vocabulary and one that has revolutionised EAP
learning (Lessard-Clouston 2010; Li & Qian 2010; Martinez & Schmitt 2012; Minshall 2013; Yang 2014). Alemi, Sarab, and Lari (2012) conducted a quasi-experimental research in which they utilised a mobile phone to teach 320 headwords; the study’s findings indicated that the experimental group performed better in delayed post-tests.

3. METHODOLOGY
This research used a quasi-experimental approach, which is ideally suited for intact and frequently formed groups (Rogers & Révész, 2019). The sample was split into two subgroups: experimental and control. The experimental group received intervention in the form of WhatsApp vocabulary learning to ascertain its effect on the L2 learners’ vocabulary knowledge (Ranganathan, Pramesh, & Aggarwal, 2016). At the start and conclusion of the research, both groups received a pre-and post-test. The WAT developed by Read (1993) was utilised as a pre-and post-test. The rationale behind choosing this exam was because WAT is accessible on Coxhead’s website and recommended evaluating participants’ academic vocabulary knowledge. Another reason for adopting this exam as a tool was that the researchers assessed the WAT’s level using the English Vocabulary Profile’s AWL level-measuring website (Text Inspector, 2021).

EVP Text Inspector analysed the WAT concerning the AWL (Profile, 2015). The vocabulary test was analysed using the EVP TEXT INSPECTOR. The figure 2 below demonstrates that the WAT is composed of sublists 1 to 9, while sublist ten vocabulary items were not included in the test.
The figure demonstrates that Read’s (1993) WAT is based on the Coxhead’s (2000) AWL. Most of the words in the WAT are from AWL’s sublists 1-9. AWL sublist 1 and 2 contains 22 word types from the test. Sublists AWL 3 contains 15 types, sublist 4 contains 14 types, while sublist 5 contains 9, sublist 6 contains 12, sublist 7 contains 7, sublist 8 contains 4, while sublist 9 contains 10 word types. While words from the AWL have not been acquired in the test. However, there is a lot of evidence that there is strong correlation between the WAT and AWL vocabulary items. Figure 3 below shows the bar chart of the AWL vocabulary.
3.1 Sample of the study
The research participants were 60 first-year students majoring in Bachelor of English Language and Literature at a university in Pakistan. Thirty students were assigned to the experimental group, while the remaining thirty were assigned to the control group. This course was selected since the incoming semester’s students are usually similar in terms of competence level. Because of the researcher’s restricted access to the sample in this study, purposive sampling was used in this investigation (Etikan & Bala, 2017). The sample for this research was non-random purposive sampling, and the sample does not reflect the whole population of interest. As a result, generalisations about the results can only be drawn with caution (Battaglia, 2008). The demographic variables are shown in Table below. The students’ ages varied from 19 to 23 years. There was 43.33% male, and 56.55% were female in the experimental group, whereas 53.33 % were male and 46.66 % were female in the control group.

Table 1. Demographic data of the participants

<table>
<thead>
<tr>
<th>Groups</th>
<th>Male</th>
<th>Female</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>13 (43.33%)</td>
<td>17 (56.66%)</td>
<td>19-23</td>
</tr>
<tr>
<td>Control</td>
<td>16 (53.33%)</td>
<td>14 (46.66%)</td>
<td>19-23</td>
</tr>
</tbody>
</table>

Table number 2 below demonstrates the range of ages of the participant in the study.

Table 2. Age range of the participants in the experimental and control group

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Experimental</th>
<th>Control</th>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>19y – 21y</td>
<td>19y – 21y</td>
<td>22y – 23y</td>
<td>22y – 23y</td>
<td>22y – 23y</td>
</tr>
</tbody>
</table>
3.2 Instruments
Word Associations Test (WAT) pre- and post-tests were used to measure the vocabulary knowledge of the samples (Read, 1993). The WAT is a well-known exam used to determine a person’s vocabulary level by assessing their written receptive vocabulary knowledge. The AWL serves as the foundation for this assessment developed by Coxhead (2000) and is accessible on her website.

3.3 Data Collection Procedure
The study was conducted during twelve weeks; the same study was conducted by (Alemi, Sarab, and Lari, 2012). The duration is suitable for this study because of the 14-week semester system the students were undergoing. The pre-test was administered during the second week of the study, with the post-test administered during the final week of the study. The pre-test results helped determine the level of vocabulary knowledge for both groups at the beginning of the study. At the same time, the control group continued to undergo vocabulary learning by in the classroom with no formal instruction. The intervention was given to the experimental group. The intervention was conducted over a ten-week period, which started from week two until week eleven of the study. Each intervention was in WhatsApp vocabulary input, whereby ten vocabulary items from the AWL word list were sent per day to the experimental group participants. In total, 500 words were sent to the students throughout the intervention period. The AWL word list comprises ten sub-lists based on the ten AWL difficulty levels. A sample of the WhatsApp vocabulary input is shown in Figure 4. The research lasted twelve weeks, the same as the length of another study by Alemi, Sarab, and Lari (2012). Pre-testing was place during the second week of the study, and post-testing took place during the final week. The pre-test findings helped establish the baseline level of vocabulary knowledge for both groups at the start of the research. Simultaneously, the control group continued to acquire vocabulary via informal teaching in the classroom. The experimental group received the intervention. The intervention lasted ten weeks, from week two to week eleven of the trial. Each intervention consisted of WhatsApp vocabulary input, in which ten vocabulary items from the AWL word list were provided daily to individuals in the experimental group. Throughout the intervention time, students received a total of 500 words. The students of experimental group chose the words for intervention. They chose 500 words out of 570 vocabulary headwords. Figure 4 illustrates an example of the WhatsApp vocabulary input.
According to Laosrirattanachai and Ruangjaroon (2021), the intervention of word lists is an effective technique for observing the development of vocabulary knowledge. Table below contains a sample of terms from the two-word lists utilised in the research.

Table 3. Sample Word lists used in the study

<table>
<thead>
<tr>
<th>First week words</th>
<th>AWL items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Abandon</td>
</tr>
<tr>
<td></td>
<td>2. Code</td>
</tr>
<tr>
<td></td>
<td>3. Coherent</td>
</tr>
<tr>
<td></td>
<td>4. Coincide</td>
</tr>
<tr>
<td></td>
<td>5. Collapse</td>
</tr>
<tr>
<td></td>
<td>6. Colleague</td>
</tr>
<tr>
<td></td>
<td>7. Commence</td>
</tr>
<tr>
<td></td>
<td>8. Comment</td>
</tr>
<tr>
<td></td>
<td>9. Commission</td>
</tr>
<tr>
<td></td>
<td>10. Commit</td>
</tr>
</tbody>
</table>
3.4 Data Analysis

frequency, mean, and standard deviation were computed using Descriptive statistics. Then, a t-test, one of the most often used techniques for evaluating differences within and between groups, was performed to determine if any differences were significant (Gravette & Wallnau, 2016). The two groups’ pre-and post-test results were compared using independent samples t-tests (Emerson, 2017). The experiment compared the intervention’s effect on the experimental and control groups. Statistical Packages for the Social Sciences (SPSS) was used to conduct the analysis (Brown, 2007).

4. RESULTS

The experimental group's pre-test mean score was 70.43, whereas the control group's pre-test mean score was 69.70. The results of the pre-test mean score demonstrate that there was no significant difference in pre-test scores between the experimental and control groups. There was a substantial difference in mean scores between the experimental and control groups in their post-test scores, with the experimental group receiving an 84.26, while the control group received a 72.10. These findings show that the AWL word lists intervention had a positive impact on the post-test outcomes.

**Table 4.** Pre-test and the post-test mean score of the experimental and the control group

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pre-test Mean Score</th>
<th>Post-test Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>70.43</td>
<td>84.26</td>
</tr>
<tr>
<td>Control</td>
<td>69.70</td>
<td>72.10</td>
</tr>
</tbody>
</table>

The independent t-test showed a significant effect of the treatment on the experimental group, and improvement was observed in the mean score difference. When the post-test mean scores of the control and experimental groups were compared, findings indicated a difference in the mean scores; control group M = 72.10 (SD = 10.93), while experimental group M=84.26 (SD= 10.53). The differences between the two means is obvious (M = 12.16, P = .00 < .05 two-tailed sig). The difference in mean scores between the groups reflects on the effectiveness of the intervention on the ‘’students' vocabulary knowledge. The results indicate that intervention effectively affected students’ vocabulary knowledge and it increased in the post-test.

**Table 5.** Independent sample t-test on the mean score of post-test for the experimental group and control group

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean Score</th>
<th>Mean difference</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>30</td>
<td>84.26</td>
<td>12.16</td>
<td>0.00</td>
</tr>
</tbody>
</table>

5797 http://www.webology.org
The paired t-test demonstrates that the experimental group had improved its results during the study period. The p-value is .000 (P-value < .05) demonstrates that the experimental group had improved its vocabulary when they were given the WhatsApp based AWL intervention. The table below shows the paired t-test results of the experimental group. The level of students’ vocabulary knowledge increased from 70.43 to 84.26 according to the Read’s WAT as demonstrated in the table.

**Table 6.** Paired sample test on the mean score of pre-test and post-test for the experimental group.

<table>
<thead>
<tr>
<th>Paired differences</th>
<th>Pair 1</th>
<th>Pre-test mean score</th>
<th>Posttest mean score</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error mean</th>
<th>T</th>
<th>Df</th>
<th>Sig. (2-tailed)</th>
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<tr>
<td></td>
<td></td>
<td>70.43</td>
<td>84.26</td>
<td>-13.83</td>
<td>9.81</td>
<td>1.79</td>
<td>-7.72</td>
<td>29</td>
<td>.000</td>
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The paired t-test results of the Pair 2 (Control Group) demonstrate that the control group did not improve its results during the study period. The p-value is .478 (P-value > .05) demonstrates that the control group had not improved its vocabulary when they were learning face to face and did not retain vocabulary after class. The table below shows the paired t-test results of the control group.

**Table 7.** Paired sample test on the mean score of pre-test and post-test for the experimental group.

<table>
<thead>
<tr>
<th>Paired differences</th>
<th>Pair 2</th>
<th>Pre-test mean score</th>
<th>Posttest mean score</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error mean</th>
<th>T</th>
<th>Df</th>
<th>Sig. (2-tailed)</th>
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<tr>
<td></td>
<td></td>
<td>69.70</td>
<td>72.10</td>
<td>-2.40</td>
<td>18.29</td>
<td>3.43</td>
<td>-.718</td>
<td>29</td>
<td>.478</td>
</tr>
</tbody>
</table>

This study’s results validated the utility of WhatsApp vocabulary acquisition. The current study’s findings revealed a substantial difference between learning vocabulary through WhatsApp and face to face. However, studying vocabulary through WhatsApp aided experimental group members in enhancing their vocabulary knowledge in the post-
test. Compared to those who learned vocabulary face to face, those who learned vocabulary through WhatsApp retained more vocabulary.

5. DISCUSSION
This means that utilising WhatsApp to acquire vocabulary aids in learning vocabulary items in students’ minds. Because students are used to spending much time using social media Apps on phones, having words on their phones may have prompted them to evaluate their vocabularies more frequently. This might be because learning vocabulary for a specific time during class did not inspire students to review the vocabulary items after class. It may be inferred that students must take responsibility for their learning to devote effort and time to acquire new vocabulary items. Furthermore, the teaching technique should motivate them to read and study the taught vocabulary on a more frequent basis and make use of the students’ enthusiasm for utilising the vocabulary learning devices through WhatsApp (in this case, WhatsApp). While both the experimental and control groups were responsible for their learning, the experimental (WhatsApp group) group maintained more vocabulary in the post-test than the control group, as shown in this experiment.

The present study is designed to determine if the use of a WhatsApp based AWL teaching helps improve students’ vocabulary learning compared to the traditional method. The findings show that WhatsApp-based AWL is more successful than conventional education at improving students’ vocabulary. The evidence for the WhatsApp usefulness corroborates the findings of Alemi, Sarab & Lari (2012), who conducted their study in a similar educational setting and other researchers (Basal, Yılmaz, Tanriverdi & Sari, 2016; Alzahrani, 2016; So, 2016). According to prior studies, these findings are consistent with earlier findings such as Alemi, Sarab & Lari (2012); they used AWL wordlist in their study but used different tests for pre-test and post-test as we used Read’s (1993) Words Associates Test. The same results were reported by Bensalem (2018); Hashemifardnia, Namazianost & Rahimi Esfahani, (2018) who studied the benefits of using WhatsApp to improve English vocabulary for college students. Almost all of the participants in the research agreed that using mobile Apps to learn English vocabulary had improved their motivation.

6. CONCLUSION AND IMPLICATIONS
Language learners must know a significant number of vocabulary words to become proficient in language and communication. It also plays an integral part in developing skills (speaking, reading, writing, and listening). In this case, the results supported the usage of technology. In the post-test, the experimental group outperformed the control group by a large margin. This research has significant limitations, despite its effectiveness in establishing the impact of WhatsApp vocabulary acquisition.
The initial restriction was the fixed amount of characters used in a WhatsApp message. Because of this constraint, each message could only send a certain quantity of words. Furthermore, the study sample was nonnative English speakers though the official and academic language of the country wherefrom the sample was chosen is English, and the medium of teaching is English. Another limitation was that we used Read’s (WAT) while other researchers are encouraged to use different vocabulary tests associated with the academic vocabulary.

Despite the constraint, the findings have several significant implications, one of which is the value of incorporating technology into language classes. Language instructors and language institutions may find the results beneficial. It provides them with a simple tool to assist students to improve their vocabulary. Because students are familiar with using their phone apps to send and receive texts, they may utilise them to supplement learning and evaluation. They may progress toward a learner-centred classroom in this manner, and students will be increasingly accountable for their learning. Although the current research did not reciprocally employ mobile learning, language instructors may utilise it reciprocally. They may, for example, give specific tests to students and suggest that they return the answers using a messenger application. Students may use mobile learning as a kind of self-study as well as instructors. Using a mobile app to acquire vocabulary may assist learners in developing and remembering the enormous number of vocabulary items, they encounter both in and out of the classroom. The study results are aligned with the digital pedagogy of vocabulary teaching and learning using mobile apps.

Modern Communication digital tools may significantly impact the underdeveloped areas of vocabulary learning of the tertiary level students at the university level. The primary significance lies in that the mobile apps may be used as a new complement to foreign language learning, especially for teaching and practising vocabulary.

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