

Effectiveness of WhatsApp as a Pedagogical Tool in Learning Phrasal Verbs: A Case Study at a Higher Educational Institute in Oman

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Abstract—This study investigates the effectiveness of WhatsApp (WA) in helping students learn phrasal verbs in an English as a Foreign Language context. Using a mixed-method approach, data were collected from 32 Level 4 students of the General Foundation Program at the University of Technology and Applied Sciences, Ibra, Oman. The students were provided with 15 phrasal verbs to be learnt and used in sentences within five weeks through WA. An achievement test was conducted in the fifth week to measure the learning. In addition, a questionnaire survey and an interview were conducted to investigate students' perceptions regarding the effectiveness of WA in learning and the challenges they faced during the process. The findings showed students' positive perception regarding WA's effectiveness as a learning tool. However, certain challenges such as distraction, poor Internet connection, and poor time management were found to hinder their learning process considerably. Overall, the study highlighted the possibility of successful WA integration in foreign language education with strategies to minimize the challenges and maximize the effectiveness.

Index Terms—WhatsApp, learning tool, phrasal verbs, perception, challenges

I. INTRODUCTION

The advent of mobile-assisted language learning (MALL) in language education as an alternative to the traditional teaching and learning methods has drawn the attention of both language educators and researchers. MALL is largely used to scaffold language skills at various stages of teaching. Internet-enabled mobile technologies are now increasingly used in language education, and portable wireless devices have altered the use of technology-supported learning (Kukulska-Hulme, 2009). However, mobile devices cannot substitute the current learning devices but instead can be considered as tools that supplement the learning through various activities and the implementation of appropriate learning content (Gay et al., 2001). The available mobile applications, which were initially designed solely for communication purposes, are now largely used in education, as pedagogic approaches, a mediatory platform and as potential teacher interventions to scaffold language learning or as teaching materials. WhatsApp (WA) is one such application that is widely used in language education. There are numerous studies on this topic, including Binti and Embi (2016) and Mbukusa (2018), who examined students' perception regarding WA use in language learning. Others have had a wider focus regarding the effective employment of WA in language education. For instance, Şahan et al. (2016) studied WA's effectiveness in helping students learn English idioms outside the classroom. Yet others, such as Jafari and Chalak (2016), have studied WA use in lexical acquisition, which is a vital aspect of language learning. Furthermore, there are several studies worldwide on WA effectiveness in language teaching and learning.

The current research is a case study at a higher educational institute in Oman. It attempts to investigate the effectiveness of WA use in teaching and learning phrasal verbs through 32 participants. The study employed both quantitative and qualitative research methods. The findings provide evidence regarding the effectiveness of WA as a pedagogical approach to enhance students' learning experience. The findings will also help teachers and students to consider the usefulness of WA in the teaching and learning process.

II. LITERATURE REVIEW

The advent of MALL in language education as an alternative to language teaching and learning has drawn the attention of both language educators and researchers. MALL is used to scaffold language skills at different stages of learning, and mobile phone applications can play a significant role in this. The development of such applications for language education is now a business worth millions and a noticeable trend in language education. Consequently, research into MALL and language education has reached new heights. According to Gangaiamaran and Pasupathi (2017), extensive usage of mobile devices has resulted in the development of innumerable mobile applications for English language teaching. Several apps are now easily available and accessible for language learners to download.

Furthermore, MALL not only enhances students' English ability but also increases their motivation to learn. El-Hussein and Cronje (2010) argue that the distinctive characteristics of mobile technology such as portability and instant information accessibility play a major role in the enhancement of English language teaching and learning. Kukulska-Hulme and Shield (2008) extended this argument and stated that MALL differs from computer-assisted language learning in its use of personal, portable devices that enable new ways of learning, emphasizing continuity or spontaneity of access and interaction across different contexts.

The ubiquitous presence of mobile applications and their numerous benefits facilitate language education in several ways. Social networking applications such as WA are gradually transforming language learning and teaching in a novel direction and are an alternative to traditional pedagogical approaches. Teachers can potentially experiment with its wider employment in teaching language skills. One of the latest trends in research into language education is evaluating and measuring the effectiveness of WA as a learning tool. There are numerous studies on the use of WA for educational purposes in EFL classrooms. Bouhnik and Deshen (2014) stated that WA as an instant messaging app has some unique features, the most significant being its potential to enhance communication within a group. Mistar and Embi (2016) examined students' perception about WA use, whereas Bensalem (2018) studied vocabulary development in an EFL context using WA and students' perceptions about this. In a similar study, Şahan et al. (2016) investigated the effectiveness of WA in helping EFL students at a state university in Turkey learn English idioms outside the classroom. Jafari and Chalak (2016), in their research at a secondary school in Iran, concluded that teachers could effectively use WA to enhance students' vocabulary learning. A similar study by Keogh (2017) involving a group of students who studied international relations in Colombia illustrated that WA can be used to scaffold lexical items related to their discipline. The study concluded that WA could be used to enhance collaborative learning and instil a sense of community among the students, which could benefit pedagogy. Meanwhile, in a study conducted in Oman, Justina (2016) concluded that WA integration has the potential to enhance reading and writing skills and increase motivation among students. Ahmed (2019) conducted research at a university in Yemen and found WA to be an effective learning tool that improved both the reading and writing skills of undergraduate students. Another study by Hamad (2017), in a higher educational institute in Saudi Arabia, concluded that WA as a learning tool fosters learners' enthusiasm and learning despite some challenges, such as the lack of teaching materials created specifically for WA and disciplinary issues among learners. Meanwhile, Alenazi (2018) extended the study in Saudi Arabia to teachers and examined whether WA was an effective learning platform for pre-service teachers in the absence of instructors.

In a Namibian higher educational context, Mbukusa (2018) explored students' perceptions toward WA as a teaching and learning tool. Panah and Babar (2020) found that WA could "improve both communication and education and can be used in instructor-learner, learner-learner, and learner-content interactions" (p. 1198). Nuraeni and Nurmalia (2020) studied the benefits of WA and how it could facilitate the language learning activities in the ESL classroom. In a more recent study, Khan et al. (2021) highlighted the effectiveness of WA as a learning tool in conventional classes. The findings of this study revealed both benefits and challenges of using WA in education, such as the lack of affordability among some students. All these studies showed that WA could be potentially included even in traditional face-to-face classes.

Wulandari et al. (2021) conducted a study on learners' perception regarding WA as a tool to enhance oral performance in class and found that the learners perceived both advantages and disadvantages. For instance, the COVID-19 pandemic was a turning point in terms of online education. Unprecedented consequences of the pandemic made ways for digital platforms and social media in education. In this backdrop, Nihayati and Indriani (2021) explored students' perspective about WA use in online teaching. Thus, existing literature on WA application as a learning and teaching tool establishes that the app's pedagogical use has diversified in language education. In this regard, for instance, Alamer and Al Khateeb (2021) investigated how teachers' informal use of WA could enhance autonomous motivation.

Overall, available literature shows that WA use as a tool in language education is growing and the research interest in this domain is diversifying into various facets of language teaching and learning. The present study explores the effectiveness of WA in helping students learn phrasal verbs at a higher educational institute in Oman.

III. METHODOLOGY

This study employed quantitative and qualitative research methods to address the following hypotheses:

Null hypothesis I: The average ATS of the female students is equal to the male's.

Research hypothesis I: The female average ATS is higher than the male's.

Null hypothesis II: The students' perception on the effectiveness of WA as a learning tool to learn phrasal verbs is less than average.

Research hypothesis II: The students' perception on the effectiveness of WA as a learning tool to learn phrasal verbs is more than average.

Null hypothesis III: The participants' average ATS is less than the average.

Research hypothesis III: The participants' average ATS is more than the average.

Null hypothesis IV: Challenges that students face while learning phrasal verbs on WA have no effect on the ATS.

Research hypothesis IV: Challenges that students face while learning phrasal verbs on WA have an effect on the ATS.

A. Participants and Context

This study's participants were Omani EFL learners at the English Language Centre (ELC) at the University of Technology and Applied Sciences-Ibra. ELC conducts two programs: the General Foundation Program (GFP) and Post-Foundation Program (PFP). Overall, there were 32 participants (19 females and 21 males) between 19 and 21 years of age. The participants were randomly selected from two different classes of Level 4 of the GFP. Level 4 was chosen as the students in this level study phrasal verb in their grammar course.

B. Ethical Issues

The researchers filled out the Ethical Approval Form prior to data collection, as required by the Research and Consultancy Committee of ELC. They also obtained approval for the research proposal and permission to conduct the study from the committee. Subsequently, all the participants signed a consent form, wherein they were informed that participation was voluntary, the data collected during the study will remain confidential, and the participants will be anonymized. Finally, the male and female students were assigned to two separate WA groups, of which the researchers were the sole administrators.

C. Data Collection

The data were collected both qualitatively and quantitatively. To begin with, the researchers briefed the study purpose to the participants. Both groups were given the same list of 15 phrasal verbs via WA to learn over the course of five weeks, averaging at 3 verbs per week. The participants were asked to find the meaning of the verbs using a dictionary, use the words in sentences, and post both on the groups, for which the researchers provided immediate constructive feedback. They intervened when the participants were unable to guess the meaning or frame correct sentences.

By the end of the fifth week, an achievement test was administered to assess how well the participants had learned the phrasal verbs through WA. The test consisted of 15 sentences containing a phrasal verb each, with 3 response options. The students were asked to choose the one that best expressed the meaning of the verb.

Next, a structured questionnaire containing 11 items on the effectiveness and challenges of using WA as a learning tool was administered. Each item was rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Finally, six participants (three from each WA group) who scored the highest, medium, and lowest score in the test were interviewed regarding their perceptions and the challenges they encountered during the learning process using WA. The interview consisted of seven questions covering themes such as perception about WA, challenges encountered, and advantages and disadvantages of WA as a learning tool.

D. Reliability and Validity

The questionnaire was translated into Arabic by a native speaker to ensure understanding by students. For the interview, the researchers used constant comparison to ensure higher reliability. They regularly reviewed and updated the questionnaire items. Additionally, a colleague reviewed the questions and examined whether they clearly reflected the topics to be assessed, that is, participants' perceptions regarding WA use and the challenges they faced while learning. The questions were posed to the interviewees in both English and Arabic for better comprehension, and this in turn contributed to the validity of the findings. A Cronbach's alpha of .758 showed that the questionnaire was reliable.

With respect to the achievement test, an experienced ESL lecturer reviewed the content, validity of the questions, and difficulty level. The questions were revised based on their suggestions and comments. Overall, the reviews and suggestions at different stages of the data collection reinforced both the reliability of the data collection tools and the validity of the findings.

IV. DATA ANALYSIS

This section presents the results of the statistical analysis of the participants' demographics, validity and reliability of the questionnaire, descriptive and inferential statistical analyses of Students' perceptions on the Use of WA as a learning tool (SPWALT), the inferential statistical analysis of achievement test score (ATS) and the correlation between ATS and the challenges in using WA as a Learning Tool (CUWALT). Analyses such as descriptive statistics (mean, standard deviation and frequency), Pearson and Kendall's tau-b correlations, one-sample t-test, independent t-test, and principal component analysis (PCA) were conducted using SPSS software (version 20). The PCA and parallel analysis (PA) were conducted for two fixed factors using varimax rotation to analyse the questionnaire.

V. RESULTS

As illustrated in Table 1, females represented 59.4% (19) and males represented 40.6% (13) of the participants.

TABLE 1
PARTICIPANTS' DEMOGRAPHICS

		Frequency	Percent
Valid	Male	13	40.6
	Female	19	59.4
	Total	32	100.0

A. Validity of the Effectiveness of WA as a Learning Tool (EWALT) Questionnaire

First, the Kaiser-Meyer-Olkin (KMO) and Bartlett tests (Table 2) were conducted to explore the rightness of the data for PCA. For validity, the significance must be lower than .05 degree of probability. The validity measure of the current questionnaire was .000. It shows that the validity could be measured.

TABLE 2
KMO AND BARTLETT'S TEST RESULTS FOR THE EWALT QUESTIONNAIRE

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.507
Approx. Chi-Square		137.252
Bartlett's Test of Sphericity	df	55
	Sig.	.000

The PCA and PA of the 11 questionnaire items resulted in two components: SPUWALT (9 items) and CUWALT (2 items). As illustrated in Table 3, the SPUWALT items were loaded onto factor 1 and CUWALT items onto factor 2. Pearson's correlation was employed to determine the extent of association amongst the extracted items.

TABLE 3
FACTOR COMPONENT MATRIX FOR THE EWALT QUESTIONNAIRE

Questionnaire items		Component	
		1	2
SPWALT1	WA is an effective tool to learn phrasal verbs.	.702	-.431
SPWALT2	WA can be used as a learning tool to learn other English lessons.	.375	-.682
SPWALT3	I felt confident and comfortable sharing the meanings of the phrasal verbs and sentences via WA.	.792	.025
SPWALT4	My friends' posts helped me understand the meaning of the phrasal verbs, come up with my own sentences, and post them on the WA group.	.439	-.070
SPWALT5	The teacher's comments on my friend's posts guided me to frame my own sentence.	.306	.116
SPWALT6	The teacher's feedback on the posts guided me to edit my own sentences to correct grammatical mistakes or wrong use of the phrasal verbs.	.696	.474
SPWALT7	Typing my sentences in the WA group is better than writing them on paper.	.795	-.235
SPWALT8	The researchers' immediate feedback was extremely helpful and insightful.	.398	.081
SPWALT9	Learning phrasal verbs through WA was convenient as the app could be accessed at a low cost, at any time, and from anywhere.	.626	-.273
CUWALT 1	Poor internet connection hindered the learning process.	.508	.559
CUWALT 2	The teacher pointing out my mistakes made me feel discouraged and embarrassed.	.421	.583

- Extraction Method: Principal Component Analysis.

-Two components extracted.

B. Reliability of SPUWALT and CUWALT

(a). *Reliability of SPWALT*

To investigate the reliability of SPWALT, Cronbach's alpha was used. As indicated in Table 4 below, the 9 items of the SPWALT component had a reliability index of .778. Thus, the strong internal consistency between these items made them suitable for data collection and analysis.

TABLE 4
RELIABILITY STATISTICS OF SPUWALT

Cronbach's Alpha	Number of Items
.778	9

(b). *Reliability of CUWALT*

As indicated in Table 5, the two items of the CUWALT component had a reliability index of .642. Thus, the strong internal consistency between the items made them suitable for data collection and analysis.

TABLE 5
RELIABILITY STATISTICS OF CUWALT

Cronbach's Alpha	N of Items
.642	2

C. *Independent T-Test of ATS by Gender*

Null hypothesis I: The average ATS of the female students is equal to the male's.

As shown in Tables 6 and 7, since $t(30) = 1.179$, $p = .248$, the t-test was not statistically significant and the null hypothesis I is not to be rejected. Therefore, there was no statistically significant difference between the female and male students' average ATS. However, the girls participated in the learning process of the phrasal verbs on WA more often than the boys.

TABLE 6
T-TEST OF THE ATS BY GENDER

	Gender	N	Mean	Std. Deviation	Std. Error of the Mean
Achievement Test Score (0 to 15)	Male	13	8.92	3.278	.909
	Female	19	7.79	2.175	.499
Average of AT – 7.5					

TABLE 7
INDEPENDENT T-TEST OF THE ATS BY GENDER

		Levene's Test for Equality of Variances		T-test for Equality of Means				
		F	Sig.	t	df	Sig. (two-tailed)	Mean Difference	Std. Error Difference
Achievement Test Score (0 to 15)	Equal variances assumed	9.177	.005	1.179	30	.248	1.134	.962

D. *Descriptive Analysis and One-Sample T-Test of SPWALT*

Null hypothesis II: The students' perception on the effectiveness of WA as a learning tool to learn phrasal verbs is less than average.

As indicated in Table 8, according to the mean interpretation, students strongly agreed with SPWALT 8, with a mean value of 4.22, and only agreed with the rest of the items, with mean values ranging between 3.63 and 4.13.

TABLE 8
OUTCOME OF THE DESCRIPTIVE TEST AND T-TEST FOR THE SPECIFIED SPWALT VALUE (AVERAGE = 3)

	N	Mean	Std. Deviation	t	Sig. (two-tailed)
SPWALT1	32	3.91	.818	6.271	.000
SPWALT2	32	3.72	.958	4.243	.000
SPWALT3	32	3.72	.991	4.101	.000
SPWALT4	32	4.03	.782	7.458	.000
SPWALT5	32	4.06	.619	9.711	.000
SPWALT6	32	4.13	.660	9.644	.000
SPWALT7	32	3.63	1.212	2.918	.006
SPWALT8	32	4.22	.751	9.184	.000
SPWALT9	32	3.91	.893	5.741	.000
Valid N (listwise)	32				

According to the one-sample t-test, since the p value was less than .05, the null hypothesis was rejected at a 5% significance level for all nine statements. Therefore, students' perception regarding the nine statements was not the

same as the average level but above it, as per the mean score. Thus, the respondents perceived WA to be an effective learning tool.

The interviewees said that learning through WA potentially promoted their confidence as a learner. A majority of the respondents said that WA was an effective learning tool. One of the respondents stated, 'WA is very effective because it helps us learn quickly and organize our time'. The student implied flexibility, which is one of the key features of WA as a learning tool. Further, the same respondent also explained that WA assisted them in quickly grasping the content while allowing effective time management without being physically present in a classroom. Some students also stated that they had no qualms about sending their sentences with the target phrasal verbs on the group, despite the possibility of mistakes. Moreover, all of them considered accessibility and flexibility as the fundamental features and advantages of WA: 'It can be used at anytime and anywhere'. In addition, they said that WA enabled teachers to provide instant feedback as in a face-to-face classroom. Thus, the students could rectify their mistakes and resend the edited sentences for a second round of feedback. Such instant feedback on the activities, that is, the continuous interaction between the teachers and students, was an advantage of WA as a teaching and learning tool.

A majority of the respondents echoed that the teachers provided quick and immediate feedback, which enabled them to correct their mistakes instantly. The promotion of independent or autonomous learning is a defining characteristic of the current language education landscape worldwide. In line with the modern language classrooms, the respondents confirmed the independent learning they experienced in concrete terms with examples: checking the meanings of phrasal verbs using a dictionary, seeking the support of a competent English language user, conducting discussions with their peers in the group, and utilising teachers' feedback to reflect on their examples, which are key characteristics of autonomous learning.

E. Inferential Statistical Analysis of the ATS

Null hypothesis III: The participants' average ATS is less than the average (7.5).

As Table 9 shows, $t(31) = 1.578$, $p = .125$; therefore, the null hypothesis was accepted at a 5% significance level with respect to the average ATS (7.5). The students' average ATS was equal to the average. Although their perception of the effectiveness of WA as a learning tool to learn phrasal verbs was high, the ATS was not statistically different from the average (7.5). The lower scores of the students could be attributed to factors such as low motivation level, challenges encountered while learning through WA, and the absence of effective teacher intervention strategy to scaffold and reinforce the target phrasal verbs. According to the interviewees, although the students liked the idea of using WA as a learning tool due to its advantages, they preferred face-to-face learning. One of the respondents said, 'I feel that on WA, we are not very responsible in our learning. I feel better to be in class as the student is present and conscious of his/her learning and we are more focused as there is nothing that can distract him/her.' Accordingly, using WA is challenging compared to face-to-face learning. Moreover, the distractions while learning through WA could have a detrimental effect on the learning process. One of the interviewees said, 'I think WA can distract us from learning as I cannot focus on the learning because I can use it for socializing at the same time.' Finally, some respondents claimed that they faced time management issues while using WA, and poor Internet connections at times interrupted their learning. These drawbacks represent some of the challenges in using WA as a learning tool.

TABLE 9
T-TEST FOR THE SPECIFIED ATS VALUE (AVERAGE = 7.5)

	N	Mean	Std. Deviation	t	df	Sig. (two-tailed)
Achievement Test Score (0 to 15)	32	8.25	2.688	1.578	31	.125

F. Correlation Statistics Between CUWALT and ATS

Null hypothesis IV: Challenges that students face while learning phrasal verbs on WA have no effect on the ATS.

As shown in Table 10, the correlation coefficient is negligible at $r(30) = .083$, $p = .552$; therefore, the null hypothesis was accepted, no correlation was found between CUWALT and ATS, and CUWALT 1 and CUWALT 2 had no considerable effects on ATS. However, the ATS might have been affected by the other challenges that the interviewees mentioned, such as poor time management, external distractions, and poor Internet connection.

TABLE 10
CORRELATIONS BETWEEN CHALLENGES IN USING WA AS A LEARNING TOOL (CUWALT) AND ACHIEVEMENT TEST SCORE (ATS)

CUWALT			
Kendall's tau-b	Achievement Test Score (0 to 15)	Correlation Coefficient	.083
		Sig. (two-tailed)	0.552
		N	32

VI. DISCUSSION

The present study investigated whether WA can be effectively utilized as a pedagogical tool to improve students' learning of phrasal verbs. The results showed that WA could be an effective tool to learn phrasal verbs with its distinctive features such as flexibility, accessibility, and instant feedback, despite its disadvantages.

The findings corroborate those of Castrillo et al. (2014), Bansal and Joshi (2014), and Plana et al. (2013) in terms of students' positive attitudes toward WA and the motivational effects related to the concepts of collaboration and interaction. They also overlap with the finding of Al-Gasaymeh (2017) in terms of the positive feelings and intentions regarding using WA in formal learning.

However, the findings related to the ATS showed that the students did not significantly benefit from using WA to learn the English phrasal verbs, that is, the actual learning was limited. This supports the findings of Dehghan et al. (2017), whose participants did not improve their vocabulary learning through WA. These researchers found that the results were affected by challenges such as poor Internet connection, lack of commitment to the task, being distracted by socializing with others on the WA groups, and being overwhelmed with their education. These findings contradicted Bensalem (2018) and Jafari and Chalak (2016), who found that WA effectively enhanced learners' vocabulary. However, it confirmed part of the findings of Jafari and Chalak (2016), in that no substantial difference was found between male and female students' learning using WA.

VII. STUDY LIMITATIONS

First, the study was limited to only Level 4 of the GFP at the ELC. In the future, it can be extended to other levels in the GFP and to the PF program to yield more generalizable findings. Furthermore, the research can be conducted in other branches that fall under the umbrella of the University of Technology and Applied Sciences. Second, no teacher interventions were used to provide students with theoretical knowledge and sufficient practice on using phrasal verbs. Instead, only the phrasal verbs were shared in the respective WA groups. Effective teacher interventions could result in more detailed findings. Finally, the study found a tendency of students to copy answers and definitions from other group members when sharing the meanings and constructed sentences.

VIII. CONCLUSION

This case study employed a mixed-method research approach for data collection. The data analysis found that the ATS of both male and female participants had no statistically significant difference. Both demonstrated a positive perception about WA as a learning tool although they preferred face-to-face learning. However, the participants encountered some challenges in using WA, which nevertheless do not outweigh the positive aspects of WA as a learning tool. The key challenges included distraction, time management constraints, and poor Internet connection. These challenges had significant impact on the students' ATS.

IX. RECOMMENDATIONS

Based on the limitations, first, a pre-test could be conducted to evaluate students' existing knowledge about phrasal verbs and thus obtain a clear picture of the sample groups. Second, effective teacher interventions such as audio or video materials about phrasal verbs or supplementary materials and teaching resources can reinforce the activities and help assess the effectiveness of WA as a learning and teaching tool in depth. Third, to avoid plagiarism among students, researchers could collect students' responses through a dedicated WA number and provide feedback individually, rather than on the group. This could prevent the embarrassment of students from teachers' feedback on the group as well as protect individual identity. Fourth, future research can focus on the different ways of enhancing the effectiveness of WA as a teaching and learning tool by focusing on overcoming the potential challenges. For example, certain higher educational institutes conduct various remedial programs for academically at-risk students to improve their language skills. Finally, researchers could evaluate how to implement WA as a main platform and a pedagogical approach to cater to academic programs for at-risk students. This would enable educational institutes to minimize the consumption of resources and provide an alternative learning experience to students.

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