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Use of Mobile Assisted Language Learning (MALL) in Teaching Vocabulary to ESP Students

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Abstract

The rapid advancement of mobile technologies proffers new contingencies and perspectives in language teaching. The leverage of these technologies on education contributes to the expansion of the approach in language teaching. The research was conducted in the form of an experiment in a vocational school in Poland. 114 ESP students in number were randomly divided into equal-sized groups, ascertained as experimental and control groups. The obtained results illustrate the acceptance of mobile devices as a learning tool indicating that the process of learning does not have to be limited to classroom activities only. The results of our study are significant in at least two major aspects. Not only do they demonstrate that using MALL in the didactic process increases the students' knowledge of vocabulary but also that the learners' attitude towards using mobile devices is positive. Implementing mobile devices as learning tools reinforces students' motivation, the sense of belonging to a particular community, and of autonomy and flexibility of learning. Based on the received outcomes, it can be concluded that the use of WhatsApp affects the ESP learners' knowledge of vocabulary significantly. Furthermore, the questionnaire results reveal students' positive attitude toward WhatsApp instruction.

Keywords: Mobile Assisted Language Learning, teaching ESP vocabulary.

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Introduction

Recent technological developments have heightened the need for investigation of the new perspectives in education. iPods, Personal Digital Assistants (PDAs), smartphones, laptops, tablets and mp3 players have expanded the area of education and communication. In particular, the emergence of text messaging has created new opportunities for educators and learners. From this expansion arises the need to investigate the influence of Mobile Assisted Language Learning (MALL) on the teaching of language, - specifically of vocabulary. Not only does mobile technology inspire, it also transforms the traditional process of learning and teaching. Thus far, numerous studies (Ishaq et al., 2020; Sharples, 2007; Attewell, 2005; Chinnery, 2006; Kukulska-Hulme & Shield, 2008; Suwantarathip & Orawiwanakul, 2015; Bensalem, 2018; etc) have investigated the influence of mobile devices on teaching and learning vocabulary.

The development of mobile technologies offers new prospects in the process of teaching vocabulary, which is one of the significant language components. Without the acquaintance of words, not only are learners unable to understand other people but also to verbalise their feelings and/or opinions. This aspect is particularly meaningful in teaching English for Specific Purposes (ESP), which emphasises the knowledge of specialised vocabulary in many areas of international science and business.

In Poland, vocational English has been introduced as a compulsory subject in vocational and technical schools. Teaching this subject requires from English teachers not only perfect didactic skills but creativity and extensive knowledge concerning the specified fields (for example, electricity, hairdressing, vehicle mechanics, and machining). The use of mobile devices can facilitate, diversify and enrich the process of teaching vocational vocabulary. Furthermore, they can ensure learners' access to authentic sources in a particular vocational domain.

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A learner repeats, copies, or creates a specific product with the usage of mobile technology, equipping it with a new, creative form. Therefore, the emergence of new technologies challenges teachers and learners to alter their approach to the educational process. Such gradually introduced changes can lead to richer, more motivational, and more creative learning environment for the learners and the teachers.

Traditionally, teaching English for Specific Purposes is based on textbooks, a resource for vocational knowledge that can be perceived as tedious. However, they cannot be ignored. For ESP teachers, textbooks are serviceable in designing a syllabus and in the partitioning of the material into smaller parts or units. Nevertheless, the emergence of mobile technologies can enrich and diversify the process of ESP vocabulary teaching. Additionally, it can be instrumental in refreshing and renewing previous methods that can reinforce student motivation and make classroom activities more appealing and enjoyable.

Implementing mobile devices into ESP vocabulary teaching offers numerous possibilities for learners and teachers. Most students possess a mobile device such as a smartphone, tablet, mp3 player, iPod etc. These devices can be successfully utilised during classroom activities. Internet access through mobile devices facilitates the use of authentic materials that can enrich students' knowledge in the field of electricity, hairdressing, mechanics, business etc. Not only does access to authentic texts or films allow students to acquire technical vocabulary or phrases that are the most serviceable in their profession, but also to recognise the vocational language as it is used in real life. The ESP learners can construct their vocabulary range by analysing company

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advertisements, magazines, and journals that introduce language that often cannot be found in conventional teaching materials. Furthermore, students can choose material that interests them the most and which they intend to discuss during the lesson. Giving students the capability to choose the material they would like to discuss and ensuring freedom of choice will increase their motivation and interest, and will influence their creative approach to learning.

Mobile devices offer students numerous possibilities to practice vocabulary. Using mobile applications, learners can drill ESP vocabulary by doing crosswords puzzles, and gap-fill, multiple choice, word matching exercises and so forth. Applications using such flashcards as Quizlet or Duolingo Tiny Cards allow students to use set tools and to create flashcards. In the case of English for Specific Purposes, student-made flashcards may be especially useful. Not only can students individually construct the flashcards containing specialised vocabulary, but they can also share the materials with their peers. Through these interactive-activities, learners get immediate feedback concerning their achievements. Furthermore, online dictionaries afford students instant access to unknown words. Learners have the possibility to verify not only the meaning of the word but also its pronunciation, synonyms, antonyms, collocations, and many other lexical items. In such an organised process of teaching, the teacher plays the role of facilitator and designer of study content. Additionally, students do not have to carry dictionaries, course books or notebooks. They can use their mobile phones anywhere, anytime they need them.

The subsequent way of teaching ESP vocabulary refers to the text messaging that is the most frequently used tool in teaching vocabulary. Short Message Service (SMS) or texting apps such as Facebook Messenger and WhatsApp can facilitate vocabulary learning and teaching. Through them learners can add photos, videos or share documents connected with their vocational development. Furthermore, the new specialised vocabulary can be presented to students in the form of pictures, translations, explanations of the meaning, and example sentences. These intelligible tools allow immediate feedback and monitoring of student achievements. They also foster a closer relationship between teacher and student. Through texting apps, the teacher becomes more available for learners, which can affect creativity in the classroom.

Finally, an example of the use Mobile Assisted Language Learning in teaching vocabulary to ESP students may be found in project-based teaching. Adopting mobile technology to assist in creating solutions enhances learners' motivation makes instruction more attractive and enjoyable.

Teaching Vocabulary with Mobile Assisted Language Learning

The continuing evolution of mobile devices has brought new ideas and possibilities in the area of teaching vocabulary. Digital devices are unavoidable in the everyday process of teaching because of their capabilities and attractiveness to the learners. Many studies investigating the field of teaching and learning vocabulary with respect to mobile devices usage have been conducted (Lu, 2008; Saran & Seferoglu, 2010; Wu, 2015; Suwantarathip & Orawiwatnakul 2015; Alkhezzi & Dousari, 2016; Bensalem, 2018). By comparing traditional techniques that are based on paper and pen materials with those that rely on mobile technologies, the researchers examined the influence of mobile device use on teaching and learning vocabulary. Using mobile devices affords a wide range of vocabulary activities that can be adjusted to ESP learners' needs and interests. Yudihiantara & Nasir (2017) list the following activities that may be used in vocabulary teaching: messaging and texting; apps to support learning (offline dictionaries, e-books, pdf materials); audio video players; and audio-video recorders. Furthermore, teachers and learners can exploit such mobile features as the camera, the voice recorder, BlueTooth, and MP3 and MP4 players (Mosavi M.T., 2012). Students can take photos of an object whose name is unknown to them, and make short films or animations of vocabulary that they are interested in. Furthermore, they can voice record to practice pronunciation. All of these features grant teachers and learners a great

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many possibilities to make vocabulary learning and teaching more creative, exciting and compelling.

Text Messaging

Text messaging is the most frequently utilised tool in teaching vocabulary. In the beginning, this term was associated with the Short Message Service (SMS). However, with the development of mobile technologies these text messages have begun to be accompanied by and/or supplanted by URL links, digital images, videos, and sound content. Nowadays, many students use SMS in their daily communication. Therefore, text messaging can be perceived as a motivating factor in teaching and learning vocabulary. A number of studies investigate the use of texting in teaching vocabulary (Lu, 2008; Suwantarathip & Orawiwatnakul 2015; Alemi, 2012; Kennedy & Levy, 2008). The conducted research is usually based on a situation in which a teacher sends some words per day to the students. The vocabulary is presented in the form of pictures, explanations of meaning, translations, giving definitions, and example sentences. The development of technology contributes to the appearance of new texting apps such as Facebook Messenger and WhatsApp, that are the most popular tools for communication used by students in their every-day activities. Not only are Messenger and WhatsApp convenient tools for chatting with friends, they are also helpful in vocabulary teaching. They enable learners to add photos and videos, and to share documents. There is also a possibility of texting through social media, which can be of service in teaching ESP vocabulary. Wikis (Wikipedia), blogs and microblogs (Twitter), video sharing (YouTube) or social media (Facebook) are only a few examples of the use of text messaging in the process of teaching new words.

Literature Review

A large number of studies reveals that there is an association between vocabulary development and exercises exploiting MALL. Suwantarathip & Orawiwatnakul (2015) investigate the influence of sending short messages (SMS) on the learners' vocabulary knowledge. They state that teaching vocabulary through SMS use raises the students' motivation and extends their familiarity with words. Likewise, the survey conducted by Nalliveettil & Alenazi (2016) shows that using mobile phones improves learners' English language skills. According to them, mobile phones dominate students' lives. Thus, English teachers can utilise their fascination with mobile technology. Furthermore, they are convinced that the use of mobile learning technology encourages the learners to work more productively and collaboratively.

Another example of implementing mobile language learning can be found in the research conducted by Alhawiti (2015). He examines the effect of the WhatsApp application for student achievement with respect to Specific Purposes. His study provides collateral evidence with respect to mobile assisted language learning. In reference to Alhawiti's research, it can be confirmed that the WhatsApp technique of teaching vocabulary affects students' inspiration and motivation for learning English. Moreover, using mobile learning has other advantages also, such as reinforcing learner individualization, responsibility for one's own process of learning, and learning at one's own pace. Alike, Bensalem (2018) investigated the impact of WhatsApp on students' vocabulary learning. In 2017 WhatsApp was the most popular application that enabled or rather facilitated the possibility of text messaging. The application can be used for free texting, making calls, or sharing data through audio, video, images, and location-sharing possibilities. Furthermore, with WhatsApp it is possible to form groups of users who are managed by the creator of the group. Bensalem suggests that WhatsApp can be used as a serviceable didactic tool in teaching and learning vocabulary. His research shows that the application offers the novelty of experience, the sense of immediacy, and the sense of belonging. These factors influenced students' motivation to learn and memorise new vocabulary.

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The aforementioned studies present mobile learning as a useful and helpful didactic tool in memorizing new words. Furthermore, it is believed that mobile learning puts the learners' needs in the centre and guarantees freedom and autonomy. To conclude, to teach vocabulary using mobile assisted language learning means to combine traditional methods with those presented by mobile learning. All this results from the imperative to provide students with a stimulating and motivating learning environment and to strengthen their level of vocabulary proficiency.

Hypotheses

The usage of mobile technology creates a wide range of possibilities to increase the level of ESP students' vocabulary, which leads to the following hypothesis:

H₁ - Learning English by ESP students using mobile devices is more attractive, more effective, and more helpful in learning new vocabulary than traditional learning.

Research Questions

This study is managed by the following research questions:

In mastering new English vocabulary is there a statistically significant difference between applying traditional techniques to learning and applying techniques using mobile devices?

Q₁ - What are the students' preferences regarding the choice of mobile devices and the use of functions available on these devices ?

Q₂ - How do ESP students perceive WhatsApp's functionality in helping them learn foreign language vocabulary?

Q₃ - How do students perceive the support provided by mobile devices in the process of learning English?

Methods

Teaching vocabulary using mobile phones and applications within the purview of young people's attention to contemporary technology. Mobile devices that are widely used by learners in everyday life have significant but still undiscovered and untapped potential as an educational tool for use in motivating learners to acquire knowledge and to improve their level of ESP vocabulary.

Participants and The Setting

The study was conducted at a vocational school in Poland in the middle of the winter semester of the most recent school year. The students were placed into classes based on the particular vocational education course chosen by the learners in the school recruitment process. One hundred and fourteen students studying in the second and third class (age 17 – 18) participated in this research. The participants were chosen randomly from the following sections: eighteen male students who were studying car mechanics (second class), fifty-two hairdressers 2 males and fifty females (26 students in the 2nd class and 26 in the 3rd), thirty electricians (16 males in the 2nd and 14 in the 3rd class) and fourteen shop assistants (8 females in the 2nd and 6 in the 3rd class). A total of 64 females and 50 males participated in the research study. The participants were randomly divided into two equal-sized groups with fifty-seven students in each group. The students met in class once a week. Each meeting covered forty-five minutes. The length of the semester was sixteen weeks. These two groups were respectively the control group that was taught with traditional activities (paper-based technique), and the experimental group that was taught with the use of the mobile application (Whatsapp based technique). Each participant of the experimental group owned a smartphone with WhatsApp installed. They were very familiar with the application as they used it daily. Whatsapp is free to download; the application enables text messaging, voice calls, video calls, and the sending images and other documents via the Internet.

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Two dependent variables that concerned students' vocabulary capabilities were measured. Pre-test and post-test were used for this purpose. The independent variable was the technique of vocabulary learning featuring traditional paper-based and WhatsApp exercises. Furthermore, the learners' attitudes towards mobile-assisted vocabulary exercises were evaluated through use of the questionnaire.

Research Instruments

The following instruments were used: pre-test and post-test, a questionnaire, and the WhatsApp application.

Pre-test and post-test

Pre-test and post-test designs are used to compare and measure the results from the experimental treatments. The pre-test and the post-test used in this research focus on ESP vocabulary. The vocabulary tests were designed to assess the students' vocabulary proficiency, covering the content in the textbooks which were used in the winter semester of the 2018-2019 school year. To study the ESP students' vocabulary ability, there were four different tests, a separate one for each professional group: car mechanics, electricians, hairdressers, and shop assistants. The pre-test was conducted before the treatments in both the experimental and the control groups to show students' vocabulary knowledge before treatment. The post-test was administered in the experimental and the control groups to measure the participants' vocabulary gain and to determine if there are differences between the achievements of students taught by means of traditional paper-based methods and by techniques employing Whatsapp.

Questionnaire

The student questionnaire aimed at investigating the extent to which ESP students at vocational school in Poland use mobile technology to acquire vocational vocabulary. The questions were clear enough for the students to understand, thus ensuring they could provide the appropriate answers. The questionnaire was composed of 20 logically arranged questions divided into three sections that consider:

- Students' general tendencies towards using mobile devices,
- Persuading students to have a positive attitude about using Whatsapp to learn to ESP vocabulary,
- Learners' attitudes towards using MALL in the teaching process.

There were eighteen close and two open questions in this questionnaire. The eighteen close items were rated on a five-point Likert scale (from 1=strongly disagree to 5=strongly agree). The Likert scale is crucial when it comes to measuring the respondents' opinions or attitudes towards the given subject. The questionnaire was conducted in the experimental group after the treatment.

Procedure

Upon completing the necessary permission procedures, and forming the experimental and control groups, the study was started in the middle of the winter semester of the 2018-2019 school year. The participants who took part in this research were informed about the purpose of the investigation at the beginning of the experiment. The students from both the control and the experimental group received an ESP vocabulary pre-test. They were assured that the test results would not affect their final grade. Both groups, the experimental and the control, were assigned the same list of sixty words over the course of four weeks, with an average of fifteen words per week. Sessions were organised following the school schedule once a week for forty-five minutes.

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The students from the experimental group received word lists via Whatsapp after the teacher-researcher created separate groups for each profession. Each of the participants joined a particular group after obtaining permission. The treatment for the experimental group was based on the sending of material from the teacher's phone directly to the learners' phones. Three terms a day were sent to the members of this group. The messages were sent at different times of the day, except for weekends and after nine p.m. The members of the control group received printed copies of word lists in the class. The vocabulary list was delivered once per week, and this was governed in accordance with the frequency of class meeting. The students from this group had one week to complete the given exercises. The tasks were based on examining the meaning of the new word in any monolingual dictionary and building a sentence with the new word. The experimental group could check the meaning of the new words by selecting an online free monolingual dictionary app, for example Macmillan Dictionary, Longman Dictionary, and many others. The students from this group had to create sentences with the received words and send them back to the teacher for correction via WhatsApp. After adjusting all the given homework (after four weeks of the treatment) during the lesson when the last homework was verified, the participants of the research took part in an unannounced ESP vocabulary post-test. The aim of the post-test was to measure ESP learners' vocabulary improvement. The purpose of such proceedings was to determine which of the used methods was more effective in improving students' ability to learn new ESP vocabulary. The form and the content of pre-test and post-test were identical. The researcher changed the order of the items to avoid students memorising the correct responses. At the end of the trial, the students from the experimental group completed a questionnaire concerning their perception of learning new ESP vocabulary using WhatsApp.

Data Analysis

The research does not reveal any names or personal participants' data. The participants of the experiment were aware of the purpose of the research in which they took part.

The quantitative data analysis was used in this experimental study to compare the initial and final levels of ESP students' classroom achievement. The students from each vocational group were randomly assigned to the experimental and the control group. Two independent t-tests were conducted for the measurement of the differences between the results achieved by ESP students both in the experimental and the control groups on pre-test and post-test. P values < 0.05 were considered statistically significant. The attitudes of the students towards the creative use of mobile assisted language learning, with particular emphasis on using WhatsApp, were measured by quantitative analysis of the data that were obtained through the questionnaire given to the participants from the experimental group at the end of the study. The results were analysed for means and standard deviations. The data obtained from the questionnaire were interpreted in accordance with the scale introduced by Orawiwatnakul&Suwantarathip (2015) in their research. A mean score of 1-1.50 described an attitude at a very negative level, 1.51-2.50 at a negative level, 2.51-3.50 at a moderate level, 3.51-4.50 at a positive level, and 4.51-5.00 at a very positive level.

All results obtained during the pre-test, the post-test and the questionnaire were anonymous. The participants were randomly assigned to the number which was only possible to decode by the researcher.

Results

The results of the experiment consist of two parts. In the first part, the results of the pre-tests are introduced. The second one demonstrates the results of the post-tests.

Results of the pre-test

First of all, an independent samples t-test was conducted to determine whether the difference in means of pretest between the control (traditional) and the experimental (WhatsApp) groups was significant prior to the treatment. The homogeneity of the groups was measured by The Levene's Test that showed, the *f*-ratio value to be 2.29299. The *p*-value was .132776. The result was not significant at $p < .05$. Thus, the requirement of homogeneity was met. The Levene's Test for equality of variances with $F=2.292$ and $p=.132$ proved that the variance of the groups was equivalent.

The independent samples t-test was associated with a statistically non-significant effect, the $t = -1.9378$ and the $p = .055165$. Table 1, presented below, illustrates the results obtained from the pre-tests in the control and the experimental groups.

Table 1. Comparison of Pre-test scores between WhatsApp Group and Paper-based group

Group	n	Mean	SD	df	t	p
Paper-based group (control group)	57	17.08	6,08	113	-1.94	.551
WhatsApp (experimental group)	57	19.77	8,50			
Mean Difference		2.69				

It was found that the pre-test mean score of students in the WhatsApp group was a little higher than that of students in the paper-based group (19.77, 17.08). As evident in the table, the result with $t = -1.94$, $df = 113$ and $p = .551$ suggest that the experimental group and control group were not different in their knowledge of the vocabulary items before the treatment. The highest and lowest scores in the control group were 40 and 8 points and in the experimental group 49 and 11 points, respectively.

Results of the post-test

To explore the results of the post-tests in both the experimental and the control groups, a t-test was used. As table 2 presents, the independent samples t-test indicated an improvement in scores from pre-tests to post-tests in both groups, as mentioned earlier.

Table 2. Comparison of Post-test scores between WhatsApp Group and Paper-based Group

Group	n	Mean	SD	df	t	p
Paper-based group (control group)	57	25.84	9.81	113	-4.29	.000
WhatsApp (experimental group)	57	33.67	9.51			
Mean Difference		7.83				

It is apparent from this table that the scores were significantly higher for the experimental group ($M = 33.67$, $SD = 9.51$) than for the control group ($M = 25.84$, $SD = 9.51$). The result reveals a statistically significant difference in the test scores at the level of .05 with the *p*-value .000039. The hypothesis assumes that learning English by ESP students using mobile devices is more attractive and more effective, and more helpful in learning new vocabulary than traditional learning. Consequently, the highest and lowest scores in the control group were 47 and 12 points and in the experimental group 50 and 13 points, respectively.

Comparison of pre-test and post-test scores

In order to investigate the range of improvement from the pre-test to the post-test in each group, a paired samples t-tests was conducted. Table 3 provides the results obtained from the descriptive statistics (Mean and Standard Deviation) for the pre- and post-tests for both groups.

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Table 3. Comparison of Pre-test and Post-test Mean Scores of Students in Both Groups

Groups		Pre-test (n=57)	Post-test (n=57)	t	p
Paper-based group (control group)	Mean	17.09	25.84	7.03	.000
	SD	6.09	9.89		
WhatsApp group (experimental group)	Mean	19.77	33.66	12.27	.000
	SD	8.50	9.59		

Before the treatment, the vocabulary mean scores of learners in the paper-based (control) group and the WhatsApp group were 17.09 and 19.77, out of 50 points. After the intervention, these scores increased to 25.84 and 33.66, respectively. The standard deviation of the two groups also varies a little bit. From the data obtained on the basis of the t-test analysis, the post-test results were significantly higher than the pre-test mean scores in both groups. Thus, it can be concluded that both groups of participants in this experiment improved their vocabulary knowledge. However, the students who did exercises with WhatsApp acquired more vocabulary than those whose instruction involved traditional paper-based techniques.

Evaluation of the students' questionnaire

After the intervention, the students from the experimental group were asked to express their attitudes towards mobile assisted vocabulary learning. The questionnaire was apportioned into three sections and contained twenty questions. There were eighteen close and two open questions in this questionnaire. The eighteen close items were rated on a five-point Likert scale (from 1=strongly disagree to 5=strongly agree).

RQ 1: What are the students' preferences regarding the choice of mobile devices and the use of available functions in these devices?

This section of the questionnaire required respondents to give information on their attitudes towards using the basic functions of mobile phones.

In response to Question 1 "What kind of mobile devices do you have?" a range of responses was elicited. The predominant mobile device among the respondents was a smartphone (57). The second place in the ranking was taken by mp3 players (52), while mp4 players (50) placed third. The survey showed that the least common mobile device among students was a tablet.

Table 4. Using basic functions of mobile phones by respondents

Statements	Mean	SD	Level
Q3 I use my mobile phone to send and receive messages	4.37	0.84	positive
Q4 I use my phone to make and receive calls	4.54	0.65	very positive
Q5 I listen to music with my phone	4.42	0.82	positive
Q6 I take photos and capture videos with my phone.	4.43	0.77	positive
Q7 I use my mobile phone to play games	4.54	0.80	very positive
total	4.46	0.07	positive

As table 4 shows, the overall use of mobile applications by students was perceived on a positive level. When considering each item, it was found that the highest scores received Q4 using a phone to make and receive calls (4.54) and Q7, using mobile phones to play games (4.54). The lowest results were observed in Q3 using mobile phones to send and receive messages which is a bit surprising in the light of this research.

RQ 2: How did the ESP students perceive WhatsApp's functionality in helping them learn foreign language vocabulary?

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This section of the questionnaire requires respondents to give information on their perception of WhatsApp usefulness in assisting their vocabulary learning. As can be observed from the data obtained from this part of the questionnaire, the majority of the respondents revealed positive attitudes towards the use of WhatsApp in teaching ESP vocabulary (Table 5).

The analysis of results obtained on the basis of the questionnaire indicates that 90% (strongly agree or agree) of the participants considered the WhatsApp exercises they received during the experiment to have been useful. They evaluated the received WhatsApp messages as clear and understandable. Over 80% of those surveyed reported that WhatsApp exercise helped them memorise new words. Furthermore, students stated that application exercises contributed to making the learning of ESP vocabulary more interesting. Approximately all surveyed admitted that exercises received via WhatsApp were convenient and easily accessed. They were allowed to review their vocabulary and complete the assignments exploiting the convenience of the flexibility of time and place and at their own pace. Almost ninety per cent of the respondents indicated that WhatsApp exercises significantly affected their vocabulary knowledge. Learners' positive impression of WhatsApp contributed to the increase in their motivation to learn new vocabulary. In the final part of this section of the questionnaire, the respondents were asked about technical problems with displaying WhatsApp messages. Only a small number of respondents (7%) indicated that they had experienced technical problems while doing their assignments.

Table 5. The ESP students' perception of using WhatsApp

Statements	Mean	SD	Level
Q8. WhatsApp exercises are useful	4.56	0.75	very positive
Q9. WhatsApp messages received were clear and understandable	4.61	0.79	very positive
Q10. WhatsApp exercises were helpful in memorizing new words	4.49	0.79	positive
Q11. WhatsApp exercises make learning ESP vocabulary more interesting	4.29	0.81	positive
Q12. WhatsApp exercises are convenient and easily accessible	4.59	0.61	very positive
Q13. WhatsApp exercises allow me to review ESP vocabulary anytime and anywhere	4.59	0.61	very positive
Q14. WhatsApp exercises affect my vocabulary knowledge	4.47	0.75	positive
Q15. WhatsApp exercises motivates me to enhance new vocabulary	4.49	0.79	positive
Q16. I have experienced technical problems with displaying WhatsApp messages	1.82	0.75	very negative
total	4.21	0.07	positive

Taken together, these results suggest that the surveyed students positively perceive the usefulness of WhatsApp in assisting their vocabulary learning. They characterise this application not only as useful but also as convenient, flexible, helpful, and a motivating tool in learning and teaching ESP vocabulary.

RQ 3: How did the students perceive the support provided by mobile devices in the process of learning English?

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The last section of the student questionnaire was devoted to examining the students' attitude towards using mobile assisted language learning in the ESP teaching processes. The table below exemplifies some of the main characteristics of mobile assisted language learning (Table 6).

Table 6. Students' attitudes' towards using MALL in the ESP teaching process

Statements	Mean	SD	Level
Q17. Mobile devices help me to learn English	4.58	0.69	very positive
Q18. I use my mobile phone as an electronic dictionary	4.58	0.64	very positive
Q19. I use mobile apps to learn ESP vocabulary	4.38	0.89	positive
Q20. I use games that improve my English vocabulary	4.49	0.84	positive
total	4.50	0.11	positive

The results obtained from this section indicate that support given by mobile devices in the process of learning English is estimated on a very positive level. (Mean = 4.58). Exploiting mobile phones as electronic dictionaries during the teaching processes was mentioned by 97% (strongly agree or disagree) of the respondents. More than three fourths of the participants (80%) said that they used mobile apps to learn ESP vocabulary. Finally, the majority of those respondents indicated that they improved their English vocabulary using games.

Together these results provide valuable insights into using mobile learning in the ESP teaching process. They reflect the students' positive attitudes towards MALL in teaching English for Specific Purposes.

Discussion

The current study found that creative use of Mobile Assisted Language Learning is significant in teaching vocabulary to ESP students. The principal purpose of the research was to ascertain which techniques, traditional paper-based or WhatsApp-based, are better for students who seek to improve their level of ESP vocabulary. The results obtained during the investigation show that both groups improved their vocabulary knowledge. However, the way students learned significantly influenced the scores. After the intervention, the students in the WhatsApp group gained better results than the ones from the traditional paper-based group.

The findings observed in this study mirror those of the previous studies that have examined the impact of MALL on learning vocabulary. Suwantarathip & Orawiwatnakul (2015), Ducate & Lomicka (2009), Chen & Chung (2008), Levy & Kennedy (2005), Lu (2008) and Gürocak, (2016) examined the influence of SMS (Short Message Service) technology on teaching of vocabulary. Furthermore, Tai, Ting (2011), Bensalem (2018) and Alhaviti (2015) investigated the effect of exploiting the WhatsApp application on the level of vocabulary knowledge. The results obtained in the research mentioned above confirm the correlation between receiving higher scores from post-tests in the experimental groups and the use of mobile applications by these students. A possible explanation for these results may be the fact that mobile phones can build a flexible learning environment in which students can decide on their own about the time and the place they want to learn (Suwantarathip & Orawiwatnakul, 2015). Furthermore, it is known that practising plays a crucial role in the growth of one's level in vocabulary. As noted by Suwantarathip & Orawiwatnakul (2015), exercises performed on mobile devices are more motivational in comparison with traditional paper-based exercises. Additionally, the researchers also mentioned that using mobile devices in the teaching process promotes communication skills. Teaching vocabulary through text messaging, including the WhatsApp application, is a technique that students like better than the traditional ones. They frequently use text messages and always

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respond to them. Thus, such a way of grasping learners' attention may increase their motivation to learn vocabulary. The results of the previous research are in line with current the findings.

The evidence for the usefulness of WhatsApp in learning and teaching vocabulary is also confirmed by the findings of Alhaviti (2016), and Wong, Looi (2010), as well as Bensalem (2018). They conducted their studies in a congruous educational setting. The participants who took part in their research benefitted from the WhatsApp technique to increase their vocabulary knowledge and to achieve more effective scores than those who learn conventionally. Finally, using mobile devices in teaching vocabulary may re-live the boredom and ease the difficulty of memorising new vocabulary (Kalati, 2013). It can be perceived as an innovative and creative technique.

The findings of the current study also emphasise the positive adjustment of the participants toward the use of WhatsApp in learning vocabulary. The results are consistent with the other research that also found that the application is useful and satisfying (Suwantarathip & Orawiwatnakul (2015), Nalliveetill (2016), and Bensalem (2018). The results obtained through the questionnaire illustrate the acceptance of mobile devices as a learning tool. They indicate that the process of learning does not have to be limited to classroom activities only. According to Ushioda (2013), the potential of mobile technology for *autonomous flexible learning* supports independent learning. Utilising mobile devices in the didactic process encourages learner autonomy, learning flexibility and freedom. It is known that mobile devices are an inseparable part of students' lives. Therefore, using various types of mobile applications for learning vocabulary may enhance students' motivation and inspiration (Kalati, 2013). Bensalem (2018) states that the effectiveness of WhatsApp can be ascribed to various factors. He mentions *the novelty of experience* of using mobile technology during classroom activities. Students are intrigued by the appearance of the new teaching technique, and they involve themselves in the learning process more enthusiastically. Furthermore, Bensalem (2018) assigns the success of using WhatsApp to *the sense of virtual community* that is created both between the students and the teacher and among the students themselves while engaging in WhatsApp group chat.

The results of this study are significant in at least two major respects. First, they demonstrate that using Mobile Assisted Language Learning in the didactic process increases students' knowledge of vocabulary. Secondly, the learners' attitude towards using mobile devices is positive. Implementing mobile devices as learning tools reinforces students' motivation, sense of belonging to a particular community, autonomy, and flexibility of learning. The findings of the current study match those observed in earlier studies (Baleghizadeh & Oladrostam, 2010) and confirm the influence of MALL on students' vocabulary achievements.

Implications

This study sought to explore the effectiveness of WhatsApp vocabulary learning. The obtained results show that using WhatsApp as a learning tool has been a positive experience for most of the participants, as it has increased their motivation for learning. Taking into consideration the results of the study and other research on vocabulary learning and teaching with using mobile devices, a number of important implications for future practice should be mentioned.

First of all, teaching English for Specific Purposes is a challenge for teachers. The mobile devices implemented in the process of teaching ESP vocabulary can make it more inviting and entertaining not only for teachers but also for learners. Furthermore, it can ensure access to authentic materials that can enrich and facilitate classroom activities.

Secondly, students should be encouraged to work productively and cooperatively using mobile devices during classroom activities because it permits them to take control of their learning. Moreover, the use of mobile technology can increase the number of participants and create a

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favorable learning environment in the classroom.

Another implication is finding ways for the integration of mobile technology with classroom activities. It can increase student involvement in the didactic process. Furthermore, allowing learners to decide on their own about the material they want to discuss is crucial for building learners' creativity.

In the light of the presented findings, it is recommended that teachers of English for Specific Purposes consider using WhatsApp or other text messaging applications (SMS, Messenger) in teaching ESP vocabulary, and integrate it into the curriculum. Not only does it allow them to increase the number of vocabulary items when time to do this in class is insufficient, but also to enhance the learners' motivation and autonomy, and to reinforce the relationship between teacher and learner. It can be crucial for the learning environment and for management of the classroom.

Finally, when designing a course that makes use of mobile learning, teachers mustn't forget to fit activities to students' needs, particularly those students with disabilities such as dyslexia, dysgraphia, dysorthography, ADHD, and Asperger syndrome.

Limitations

A number of important limitations need to be considered. First, the participants of the experiment should be tested once more a few weeks after finishing the research procedure to measure their capability to memorise the words they learned during the research. Another limitation may be that there were four different vocational groups investigated: hairdressers, shop assistants, electricians and car mechanics. Although each group received pre-tests and post-tests consisting of fifty questions, they differed with respect to range of vocabulary difficulty. While shop assistants required ordinary business vocabulary, electricians or car mechanics needed language that dealt with technical concepts. Furthermore, not only did the given tasks require the knowledge of vocabulary but also the knowledge of the vocational skills regarding, for example, electricity, vehicle mechanics or hairdressing. Finally, the amount of time spent by each group on the vocabulary activities was beyond the control of the researchers. The amount of time spent on practicing vocabulary might influence the results of the study.

Future Research

More studies should be conducted to explore the influence of WhatsApp on vocabulary learning and teaching. The current findings may be a contribution to the growing literature on MALL and encourage further research in the local context.

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