*Research Article*

# The Effects of MALL on Language Learners' Mastery of Technical Collocation: Use of Instagram and Adobe Connect

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**Abstract:** Technology is dramatically altering the educational systems around the globe in one way or another. Considering the importance of technology in one hand and the significance of learners' vocabulary mastery on the other hand, the researchers have attempted to investigate the possible effect of Instagram and Adobe Connect on Iranian undergraduates' technical vocabulary enhancement in digital ESP settings. In so doing, 60 participants ranging in age from 18 to 40 were selected to achieve the goal of this quasi-experimental study. The participants were then divided into two experimental groups which practiced vocabulary learning procedures (i.e., corrective feedback tasks, output tasks, and input enhancement strategies) in the above-mentioned platforms. Several statistical procedures such as a paired-sample t-test and an independent sample t-test were run in distinct phases. The results indicated that both groups made progress with respect to their vocabulary mastery, but the Instagram group outperformed the other. The pedagogical implications of the study are also presented together with the suggestions for further research.

**Keywords:** Adobe Connect, EFL learners, Instagram, mobile-assisted language learning, technical vocabulary learning

## 1. Introduction

Today, new generations are living in a world where the flows of information, applications, technologies, and data are shaping and reshaping their life style every day. In light of globalization and with the abundance of technological resources, new generations demand a learning environment equipped with modern teaching methods and procedures. That is, the fact that the world has become technologized may not only facilitate the learning process, but also broaden the scope of learning beyond classrooms. Moreover, the COVID-19 pandemic has added a lot to the changes made in the educational settings including universities, schools, and academic centers. The same has happened to the teaching procedures and learning processes involved in the field of second or foreign language learning and teaching. As universities have been closed and more and more students are required to stay at home, online teaching is not a supplementary approach or a blending method, but an obligatory teaching system for all universities in Iran. In such a learning context, the educational systems shall undergo profound modifications so that students could obtain the most out of such circumstances. One of the solutions that stakeholders and policy makers employ is using technology and digital devices.

Among all innovations, mobile phones are more accessible and therefore are more utilized among young adults. According to the studies conducted on MALL, it has been indicated that technology use has a positive impact on language learning (e.g., Kondo et al., 2012; Liakin *et al.*, 2015; 2017; Stockwell, 2010). Such being the case, the need for making use of the latest technology has inspired scholars and academics scrutinize the effectiveness of MALL. Mobile social networking provides learning opportunities and supports successful learning environment (Almekhlafy & Alzubi, 2016). It is stated that mobile devices provide English language learners with an effective way to improve their writing ability, which is essential to their future academic performance and career development. Technology cannot be separable from young learners' daily lives. It is of paramount importance for enhancing their writing skill and their learning motivation (Chen, Carger, & Smith, 2017). Xu *et al.* (2017) put an emphasis on learners' perception about the role of mobile feedback for their oral performance. They concluded that the learners are willing to receive feedback about their speaking via mobile applications and mobile feedback increases their self-confidence while speaking.

When the matter of language learning and teaching is concerned, vocabulary is regarded as the building block of and language. By the same token, Viera (2017) believed that learners' grammatical competence is no more at the locus of scholars' and academics' attention, rather it is vocabulary that plays a key role in acquiring a second or a foreign language. Learners would not be able to express themselves or understand others without having sufficient knowledge of vocabulary. Alqahtani (2015), in addition, stated that in the field of foreign language learning and teaching, meanings of new words learners encounter in their books or in their classrooms are emphasized often and vocabulary knowledge is regarded as a critical tool for language learners as lack of proficiency in vocabulary hinders successful communication.

Considering the importance of vocabulary in the process of language learning and teaching and in holding a successful conversation, it is vital to mention that jargon and terminologies of any field are one of the areas that cause problems for undergraduates. As a matter of fact, the mastery of technical vocabularies in educational settings

has been a controversial issue in English for Specific Purposes (ESP). In the literature of second language acquisition research, studies on vocabulary have largely focused on general English and little attention has been paid to technical vocabulary learning in ESP courses. Since ESP courses consist of a lot of technical and specialized terminologies and abbreviations, vocabulary teaching lies at the heart of teaching programs in ESP.

ESP courses require teaching procedures that concentrate on new strategies such as noticing, input enhancement, output tasks, and corrective feedback. Vocabulary learning in ESP has received a little attention, and therefore the current study mainly focused on this area which has been neglected in EFL research domain. Berne and Blachowicz (2008) stated that vocabulary teaching might be a demanding task for teachers when they are not confident about the best practice they can employ in their classes and when they do not know where to start while they want to put an emphasis on word learning. The new age of media has revolutionized our world and whatever is involved in it including our classes, teachers, learners, and even the materials we have. In educational settings, teachers, as pioneers of this transformation, have access to various types of digital electronics and applications, but they need to know which would facilitate the process of learning and teaching more.

Research on Mobile Assisted Language Learning (MALL) has indicated that EFL teaching and learning have been substantially influenced by the advent of various technological apparatuses. Accordingly, their potential effect on language learning cannot be denied. Mobile apps have undoubtedly changed the world of teaching and learning in a way that the key elements involved in old-fashioned methods of teachings including teacher, textbooks, and blackboard might not be sufficient on their own to arouse learners' enthusiasm. Such being the case, mobile apps have been constantly used as a supplementary. Among the various applications which are available and applicable worldwide, Instagram is used by millions of people and is considered as a popular application. With over one billion active users around the globe, Instagram is currently one of the most popular Social Networking Services (SNSs) (Instagram Press, 2020).

According to the studies done on MALL, as an effective teaching and learning tool, Instagram has provided learners with language practice opportunities that can maximize input and enhance their learning and accuracy (Erarslan 2019, Fathi, 2018, Wahyudin & Mulya Sari, 2018). However, it is noteworthy to maintain that the current study did not attempt to support pervious findings regarding the influence of Instagram, but rather it endeavored to extend the domain of the studies done in this respect and compare the effects Instagram has on language learners with the effects of Adobe Connect that has been mainly employed at universities due to the pandemic of Covid 19. To explain it in more details, the present study aimed to investigate the effects of Instagram and Adobe Connect application on language learners' mastery of technical vocabularies, and then compare their effects to find out the application that is more effective regarding online technical vocabulary teaching and learning. In so doing, the researchers attempted to determine which of the applications is more effective and is more accepted by the undergraduates. The main concern of this study is to determine whether or not these two applications are effective tools for creating a situation in which both teachers and learners could achieve the most with respect to using strategies and learning technical collocations. It is hope that the results of the current study would let stake holders and policy makers know which application is more popular and accepted by undergraduates.

The present study has endeavored to add to the growing body of research investigating the effects of MALL on language learning as there is still a necessity to do more research in this filed to determine an application which is more user friendly, popular, and appropriate for undergraduates. Since the outbreak of the pandemic, the researchers as university lecturers have received negative feedback from students and collogues regarding using Adobe Connect application in their classes. Such dissatisfaction made the researchers to conduct a relevant study and compare the effects of employing Adobe Connect application with the effects of another application namely Instagram.

To the best of our knowledge no study has yet been done to compare the university selected application, that is, Adobe Connect, with another popular application, namely Instagram to specify the mobile app that is more effective and is favored more by the university students. The present study could be regarded as a novel investigation in both MALL and ESP research. Utilizing quantitative methods, this study aimed to examine the impact of these two applications more thoroughly. With a particular focus on ESP undergraduates, the present study provided in-depth information about how undergraduates may benefit from efficient utilization of different mobile applications. The findings of this research could be beneficial for students, English teachers, educationalist, and policy makers as well. Such comparison may help stake holders to gain profound insights regarding the most potent application which is supposed to be mainly utilized at university system. Accordingly, to fulfill the research objectives, the following research questions have been raised:

$RQ_1$. Does using Instagram have any significant effects on Iranian undergraduates' technical vocabulary learning in ESP courses?

$RQ_2$. Does using Adobe Connect have any significant effects on Iranian undergraduates' technical vocabulary learning in ESP courses?

$RQ_3$. Is there any significant difference between the effects of Instagram and Adobe Connect on Iranian undergraduates' technical vocabulary learning in ESP courses?

The following null hypotheses have been designed, based on the research questions:

$H0_1$. Using Instagram does not have any significant effects on technical vocabulary learning among Iranian undergraduate in ESP courses?

$H0_2$. Using Adobe Connect does not have any significant effects on technical vocabulary learning among Iranian undergraduate in ESP courses?

$H0_3$. There is no significant difference between the effects of Instagram and Adobe Connect on Iranian undergraduates' technical vocabulary learning in ESP courses.

**Literature Review**

**Mobile-Assisted Language Learning**

In the last decade, many studies (e.g., Almekhlafy & Alzubi, 2016; Chen, Carger, & Smith, 2017; Ryabkova 2019) have been conducted on electronic learning (e-learning), mobile learning (m-learning), and digital learning (d-learning) and all supported the beneficial effect of employing technology in language classes. It is believed that mobile-learning promotes independent learning and adds creativity to classrooms. Ryabkova (2019), for example, believed that mobile educational technologies improve learning activities, enhance communication in the target language, and increase not only students' language proficiency but also their learning effectiveness.

Scholars and academics have provided various definitions for mobile learning, each concentrating on specific feature of using mobile devices, such as smartphones or tablet computers, for learning. Park (2011) defined mobile learning (m-learning) as individuals' use of mobile phone or any other wireless device with the aim of learning something while they are on the move. Kukulska-Hulme and Shield (2008) also described mobile learning as particular type of learning which is mediated by employing small portable devices. Such devices are supposed to be available almost all the time and can be adapted with respect to the students' immediate context. According to O'Malley et al. (2003), mobile learning refers to "any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies" (p.). As observed, there have been several definitions to describe the term of mobile learning and all of them attempt to connect the impact of mobile to learning.

Generally speaking, m-learning includes portable mobile learning devices with the affordance to connect to the internet wherever and whenever required. Being provided with the internet, learners who are travelling can benefit from m-learning without interrupting their journey. They can choose any settings they want including real contexts (e.g., the lake side) or virtual ones (e.g., a virtual space craft) and this fosters their learning and thinking abilities. Such personalization of the learning environment, in fact, motivates learners and enhances the outcomes of distant education through m-learning (Sönmez *et al*., 2018).

Learners have positive perception on the usage of MALL and find it useful and easy to use. Therefore, they believe that it enhances the teaching and learning process. M-learning gave learners the opportunity to have access to different useful materials, to try various English, and to communicate and interact with their teachers and peers using English. (Azli *et al*., 2018). Individuals with no chance of physically exploring culturally important sites in the target culture can still enjoy and learn the target language architecture and culture by taking virtual tours using their mobile devices at any time and in any place. Learning, in this case, can be self-paced and this enables learners to have access to learning materials when required (Han, 2019). In the same respect, Chung *et al.* (2019) suggested that m-learning enables learners to get involved in meaningful learning and link what they have learnt to their daily life and real-world scenarios. Learners actively use mobile systems to obtain knowledge by interacting with peers, events, and real-world learning targets. Mobile devices are considered as an influential way that enable learners to obtain self-learning materials rather than mediation learning across various contexts.

The more relevant literature of MALL to the current study goes to the following findings. Abidin (2012) introduced three functions of mobile learning regarding the learning processes involved in classes. These functions include supplements, complement, and substitution. Nowadays, due to the pandemic of Covid 19, education through mobile seems to be compulsory and students have no freedom to choose the mobile learning. The practical uses of mobile technology in language learning such as portability, the anytime-anywhere advantage, ubiquity, coast, interaction and engagement, motivation, collaboration, assistive technologies (Mehdipour & Zerehkafi, 2013) have made such obligation plausible as well as enjoyable. It should be noticed that MALL differs from CALL (computer-assisted language learning) since Mall is personal and portable. More importantly, it enables individuals to have continuous access and persistent interaction with others across different contexts of use (Kukulska-Hulme *et al.*, 2008).

Mobile applications are basically referred to as apps which are special types of software designed to be used by an individual on a smartphone or a tablet computer (Han, 2019). They differ from one another considering their purpose, scope, and design. Obviously, employing smartphones alone does not automatically lead to language learning. Apps provide learners with situated learning, personal empowerment, and local and global integration. They can combine language and culture learning into localized settings and can lead to social connectivity. The learning content can be customized and personalized so that the users would be able to integrate their new knowledge and skills into real-world settings (Godwin-Jones, 2017).

One of the highly popular apps constantly favored by individuals with different gender, age, race, and ethnicity is Instagram. Concerning the role of making use of Instagram in learning environments, Kelly (2015) investigated how the Social Instagram could improve learners' descriptive writing proficiency and concluded that if used properly, Instagram can be considered as an effective pedagogical tool. The effects of Instagram application on learning grammatical accuracy of word was also examined by Yadegarfar and shahla (2016). They found utilizing Instagram application has a positively significant effect on undergraduate TEFL students' learning and increases the students' level of the grammatical accuracy of word classes. Moreover, it was indicated that undergraduate TEFL students had a positive attitude toward utilizing MALL.

In a study conducted by Aloraini (2018), the researcher observed that vocabulary and grammar posts affected not only the amount of learners' language production, but also their accuracy in language output. In the same line, Hape (2018) suggested Instagram as the media in learning speaking in order to get extra time to study. In this research, the supplementary function of Instagram was focused and Instagram was suggested to be employed for learning other skills and in academic setting such as formal schools. In another related study, AlGhamdi (2018) investigated the effect of Instagram on learning English among Arab learners. Based on the obtained results, it was indicated that Instagram is an effective tool in learning English for Arab learners of English. Erarslan (2019), in their study, analyzed university students' opinions about Instagram as an educational platform regarding educational and language learning purposes. Additionally, the effect of Instagram as a supplementary tool on students' language learning process was studied in formal classes. The result demonstrated that Instagram is the most frequently used social media platform among the learners and they tend to use it for language learning purposes. Furthermore, based on the learners' achievement scores, it was indicated that Instagram positively affected their language learning.

Before the onset of the Coronavirus Pandemic in Iran, Adobe Connect, in comparison with Instagram, was not that much popular in academic settings. According to Bolona Lopez (2015), Adobe Connect with its video conferencing capacity is mainly employed in higher education. The tool enables individuals to have different size of gatherings ranging from informal online meeting to larger webinars. Sharing desktops and using sound and video systems, Adobe connect let individuals to interact and collaborate with each other. Mehrabi and Homapour (2018) compared Adobe Connect Platform and Skype Software to find out which one has a better effect on French language learners' oral comprehension. The results of the statistical analyses revealed that Adobe Connect Platform had a better function on language skills improvement.

**Vocabulary Learning**

From the very first stages of learning a language, vocabularies, words, and their meanings have always been concerned. The existence of languages would not be possible without words as they carry the meaning the speakers want to convey and the intentions the utterers want to share. By the same token, Wilkins (1972, as cited in Abbasnejad & Kamali, 2019, p. 37) stated that "without grammar, little can be conveyed but without vocabulary, nothing can be conveyed.

According to Read (2000), "words are the basic building blocks of language, the units of meaning from which larger structures such as sentences, paragraphs and whole texts are formed" (p. 1). Ansarian *et al.* (2012) also stated that vocabulary can be defined as a group of words that an individual knows how to use regularly. Having such knowledge of vocabulary is considered to be essential for understanding and communicating with others. Moreover, Qian (2002) asserted that while learners are involved in the process of English learning, the main obstacle they have is related to the entirely new words they come across in English articles and papers.

Bearing the importance of vocabulary in mind, language learners have some difficulties when they want to memorize the new vocabularies. One of the serious problems learners encounter is the loss of information or forgetting the learned vocabularies over time. Individuals may better remember the information just after they learn but when no repetition occurs, during the passage of time, the learned material will be forgotten. The pace of losing the learned material is contingent upon various factors entailing the method used for representing information, the difficulty of the information learned, and physiological factors like learners' stress or their quality of sleeping. Information loss or forgetting can be explained by the decay theory which states that memory traces may gradually disappear after the information is learned. It may also result from the inference of other information, activities, and tasks over time (Chen *et al.*, 2008)

Different suggestions are made in order to guide the steps learners are required to take to be successful in maintaining the words in their mind. As stated by Brown and Payne (1994), with respect to learning a foreign language, learners usually take five main phases including encountering new words, obtaining a clear visual and/or auditory image, learning the meaning, creating form-meaning memory connections, and employing the new word. When encountering time limitations, talented learners, as explained by Khatib *et al.* (2011), rely on creating short cuts to effectively learn vocabularies. These short cuts which are known as vocabulary learning strategies have been focused in various studies and researchers have attempted to explore and introduce them. Evaluating the relationship observed between vocabulary size and vocabulary learning strategies, Rezvani Kalajahi and Pourshahian (2012) noticed that ELF learners sufficiently operated psycholinguistic strategies. Alhaisoni (2012), for instance, noted that Saudi EFL undergraduates make use of cognitive and meta cognitive strategies more frequently and they do not employ affective and memory strategies that much. Khatib *et al.* (2011), in their study on 146 undergraduate students, observed that authentic language use, word organization, and self-motivation were among the vocabulary learning strategies that upper-intermediate learners preferred. Amirian and Heshmatifar (2013) investigated the most and the least common learning vocabulary strategies employed by EFL university students and found that determination, cognitive, memory, metacognitive, and social strategies were respectively among the most frequently to less frequently used strategies.

## 2. Methodology

### Participants

The setting for the current study was Sama University in Karaj. A total of 110 pre-intermediate level students were initially involved in this study. However, as the study was conducted during the pandemic of Covid 19 and the teaching system was primarily online, the 60 participants who continuously engaged in the treatment sessions were selected as the sample of the current study and others were omitted. The participants were all university students studying technical language of physical education and sport science in English as an educational course. The participants were all males ranging in age from 18 to 40. They were assigned into two experimental groups, each consisting of 30 participants. They were all native speakers of Persian who were not exposed to English outside the classrooms. Purposive sampling was utilized in this study as the participants not be chosen randomly and they were selected from already formed classes.

### Instrumentation

To determine the participants' level of technical vocabulary, a piloted teacher-made test was deployed on line. The test employed yielded reliable scores and showed evidence of different types of validity. Moreover, as far as the current study aimed to concentrate on learning English for specific purpose in general and learning technical vocabularies in particular, no separate examination was administered to test general language proficiency of the students. Accordingly, other areas of language proficiency were not concerned and the mentioned ESP test was used for both selecting homogeneous subjects and administrating the pretest. The test comprised 30 multiple-choice and picture-cued items. The students were expected to answer the questions within 30 minutes. As the time interval between the pretest and the posttest was long enough to avoid the testing effect, the same test was employed as the posttest for determining the effect of Instagram and Adobe Connect applications on the acquisition of the target forms (i.e., technical vocabularies).

### Procedure

The research was conducted in the summer semester and lasted about one month and half. The implementation of this study included three main phases. First, prior to gathering the data, the researcher briefly explained the purpose of the study and the research procedures to each class.

To evaluate the learners' knowledge of technical vocabularies prior to the application of any type of intervention, a 30-item multiple-choice pre-test was administered. This piloted teacher-made test was used for homogenizing the participants in terms of their proficiency level of technical vocabularies and determining and comparing the effect of different online teaching applications. Among the participants who took the test, 60 students whose scores were one standard deviation above and below the mean were selected. They were obliged to participate in all sessions and accomplish all tasks of the study.

Second, the study involved in two experimental groups each including 30 participants. For the first group, Adobe Connect application, which was chosen by Azad University as an online teaching system for running students' educational course, was made use of. The second group, on the other hand, followed an Instagram page which was made by the instructor for the purpose of technical vocabularies teaching and learning.

The next step of the experiment concentrated on the treatment stage. Employing Adobe Connect and Instagram, the technical vocabularies were taught through output tasks, corrective feedback tasks, and input enhancement strategies. These strategies were used for both groups but in different ways and environments.

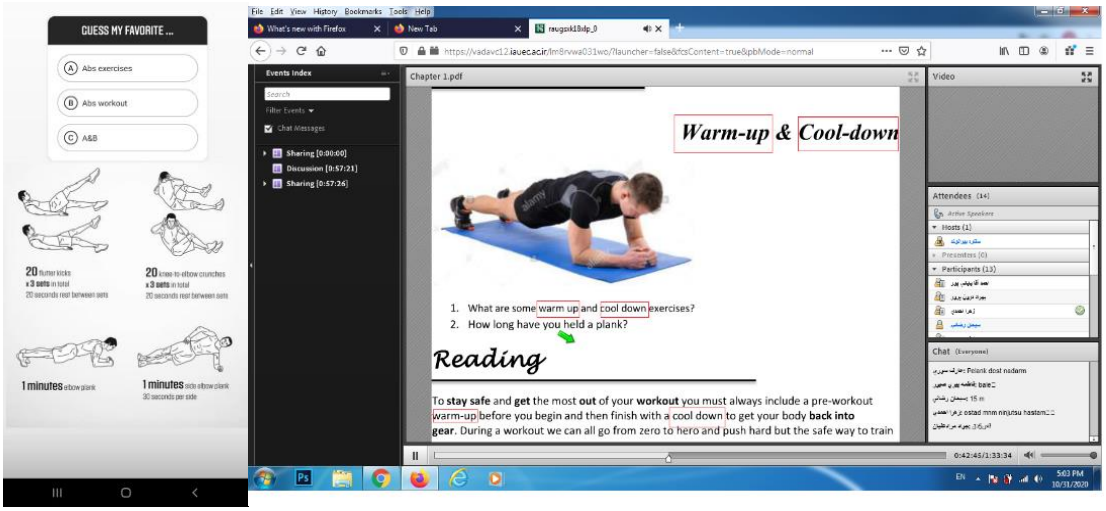


**Figure 1.** An example of a corrective feedback task for the Instagram group (on the left) and input enhancement for the Adobe connect group (on the right).

Due to low pace of the Internet connection in the country, the instructor mainly deployed broadcasting microphones, shared content from local device, viewed and edited notes, participated in chat, enabled voice rights for all of the participants, shared white board, and used drawing tools on whiteboard during teaching. In general, Adobe Connect environment looks more educational than Instagram. However, Instagram environment seems to be more interesting for the young. Sharing Stories enabled the instructor to upload short video clips or photos as an ongoing story that lasts for a maximum of 24 hours, while recorded content in Adobe Connect was accessible only between 8 p.m. up to 8 a.m. Instagram also provided the students with an opportunity to share their comments and leave impressions. Using Adobe Connect, the students could chat during the class, but their comments were not specified for the contents. Moreover, Instagram stories enabled the participants to receive corrective feedback even in cases where the instructor was not be online.

After the treatment stage, the posttest was administered to the participants in both groups. In fact, the purpose of the posttest was to measure the participants' mastery of technical vocabularies of physical education and sport science field after the treatment. The data obtained were eventually submitted to the Statistical Package for Social Science (SPSS) version 22 for further analyses.

**Design**

This study was a quasi-experimental one with a two-group pretest-posttest design. Quasi-experimental designs lack the key ingredient of random assignment (Best & Kahn, 2006). As stated by Ary *et al.* (2010), in many situations where researcher are conducting educational research, they manipulates the independent variable(s), but cannot randomly assign the participants to treatments groups. In such situations where no full control is assured, one should make use of quasi-experimental designs. Because of the university's policy and regular teaching program, it was not possible to randomize the participants into different groups and the students were required to remain intact in their regular classes during the intervention time slots. Moreover, according to Best and Kahn (2006), the design was also a pretest-posttest design. In such designs, pretests are administered before the application of the experimental and control treatments and posttests at the end of the treatment period.

## 3. Results and Discussion

The purpose of this study, as mentioned above, was to compare ESP undergraduates' technical vocabularies knowledge through the effect of using Instagram and Adobe Connect applications. The data collection procedure was carefully performed and the raw data were submitted to SPSS version 22 to do the required statistical analyses in order to address the research questions and hypotheses of this study.

To select an appropriate statistical technique, the normality of the data collected from participants' performance across the two groups was checked to meet the assumptions of the required statistical techniques. To use the statistical techniques, there was a necessity to check the two assumptions of the normality of the distributions and homogeneity of variances assumption.

With respect to the former, One-Sample Kolmogorov-Smirnov test was utilized. As observed in the table the data obtained were not normally distributed as the p-values of experimental groups were .026 and .005 which are both lower than the standard level of significance which is set on .05 in the current study ($\alpha = 0.05$; $p < \alpha$ ).

**Table 1:** Tests of normality; one-sample kolmogorov-smirnov test

| | | **Pretest of vocabulary** | **Posttest of vocabulary** |
|---|---|---|---|
| N | | 60 | 60 |
| Normal Parameters[a,b] | Mean | 16.7167 | 19.4000 |
| | Std. Deviation | 2.91165 | 2.75681 |
| Most Extreme Differences | Absolute | .122 | .141 |
| | Positive | .083 | .141 |
| | Negative | -.122 | -.094 |
| Test Statistic | | .122 | .141 |
| Asymp. Sig. (2-tailed) | | .026[c] | .005[c] |
| a. Test distribution is Normal. | | | |
| b. Calculated from data. | | | |
| c. Lilliefors Significance Correction. | | | |

Next, an independent t-test was run to compare the groups' means on the technical vocabulary test in order to prove that they enjoyed the same level of technical language proficiency prior to the main study. Based on the results displayed in Table 2, it can be claimed that the Instagram group (M = 17.70, SD = 2.11) and Adobe Connect (M = 15.73, SD = 3.27) group showed almost the same means on the technical vocabulary test.

**Table 2:** Descriptive Statistics; Pretest of both Groups

| | **Group membership** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
|---|---|---|---|---|---|
| Pretest of vocabulary | Adobe Connct group | 30 | 15.7333 | 3.27933 | .59872 |
| | Instagram group | 30 | 17.7000 | 2.11969 | .38700 |

**Table 3:** Independent samples test, pretest of both groups

| | | **Levene's Test for Equality of Variances** | | **t-test for Equality of Means** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Pretest of vocabulary | Equal variances assumed | 6.640 | .013 | -2.759 | 58 | .008 | -1.96667 | .71291 | -3.39371 | -.53963 |
| | Equal variances not assumed | | | -2.759 | 49.631 | .008 | -1.96667 | .71291 | -3.39885 | -.53449 |

The results of the independent *t*-test (t (58) = -2.75, p = .008) in Table 3 indicate that there was not any significant difference between the two groups' mean scores on the technical vocabulary test. Thus, it can be claimed that they enjoyed the same level of technical language proficiency prior to the main study.

As it is mentioned in the method section, this study aimed at assessing the effects of two different mobile's app on the students' performance in technical vocabulary knowledge. To do so, two paired samples *t*-tests were run to compare each group's pretest and posttest.

First, a paired-samples *t*-test was run to compare the Adobe Connect group's means on the pretest and posttest of technical vocabulary knowledge in order to investigate the effect of Adobe Connect app on the mastery of technical vocabulary. As displayed in Table 4, the Adobe Connect group had a higher mean on the posttest of technical vocabulary (M = 17.70) than pretest (M = 15.73).

**Table 4:** Descriptive statistics; pretest and posttest of the adobe connect group

| | | **Mean** | **N** | **Std. Deviation** | **Std. Error Mean** |
|---|---|---|---|---|---|
| group 1 | pretest AC | 15.7333 | 30 | 3.27933 | .59872 |
| | posttest AC | 17.7000 | 30 | 2.11969 | .38700 |

**Table 5:** Paired samples correlations; pretest and posttest of the adobe connect group

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| group 1 | pretest AC & posttest AC | 30 | .876 | .000 |

**Table 6:** Paired-Samples t-test; pretest and posttest of the adobe connect group

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| group 1 | pretest AC - posttest AC | -1.96667 | 1.75152 | .31978 | -2.62069 | -1.31264 | -6.150 | 29 | .000 |

The results of the paired-samples *t*-test (t (29) = -6.15, p < .05 representing a large effect size) indicated that there was a significant difference between Adobe Connect group's means on the pretest and posttest of technical vocabulary. Thus, it can be claimed that Adobe Connect affected the participants' mastery of technical vocabulary. The Adobe Connect group had a higher mean on the posttest of technical vocabulary (M = 17.70) than pretest (M = 21.10).

Then another paired-samples t-test was run to compare the Instagram group's means on the pretest and posttest of technical vocabulary knowledge in order to investigate the effect of Instagram on the mastery of technical vocabulary. As displayed in Table 7, the Instagram group had a higher mean on the posttest of technical vocabulary (M = 21.10) than the pretest (M = 17.70).

**Table 7:** Descriptive statistics; pretest and posttest of the Instagram group

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| group 2 | pretest Ins | 17.7000 | 30 | 2.11969 | .38700 |
| | posttest Ins | 21.1000 | 30 | 2.23375 | .40783 |

**Table 8:** Paired Samples Correlations; Pretest and Posttest of the Instagram Group

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| group 2 | pretest Ins & posttest Ins | 30 | .079 | .677 |

**Table 9:** Paired-Samples T-Test; Pretest and Posttest of the Adobe Connect Group

| | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| group 2 | pretest Ins - posttest Ins | -3.40000 | 2.95483 | .53948 | -4.50335 | -2.29665 | -6.302 | 29 | .000 |

As displayed in table 9, the results of the paired-samples *t*-test (t (53) = -4.503, p < .05 representing a large effect size) indicated that there was a significant difference between Instagram group's means on the pretest and posttest of technical vocabulary. Accordingly, it can be stated that using Instagram influenced the participants' mastery of technical vocabulary. The Instagram group had a higher mean on the posttest of technical vocabulary (M = 17.70) than the pretest (M = 21.10).

Finally, another independent *t*-test was run to compare the Adobe Connect and Instagram groups' means on the posttest of technical vocabulary in order to probe whether there is a significant difference between the effects of Instagram and Adobe Connect on undergraduates' technical vocabulary learning in ESP courses. Based on the results displayed in Table 10, it can be claimed that the group in which Instagram was used had a higher mean on the posttest of technical vocabulary (M = 21.10., SD = 2.23) than the group in which Adobe Connect was employed (M = 17.70, SD = 2.12).

**Table 10:** Descriptive statistics of the posttest of technical vocabulary of both groups

| | Group membership | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Posttest of vocabulary | Adobe Connct group | 30 | 17.7000 | 2.11969 | .38700 |
| | Instagram group | 30 | 21.1000 | 2.23375 | .40783 |

**Table 11:** Independent samples test, posttest of technical vocabulary of both groups

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Posttest of vocabulary | Equal variances assumed | .421 | .519 | -6.04 | 58 | .000 | -3.40 | .562 | -4.52541 | -2.27459 |
| | Equal variances not assumed | | | -6.04 | 57.84 | .000 | -3.40 | .562 | -4.52547 | -2.27453 |

The results of the independent *t*-test (t (58) = 6.047, p = .000 representing a large effect size) (Table 11) indicate that there was a significant difference between the two groups' mean scores on the posttest of technical vocabulary. Thus, it can be declared that although both Adobe Connect and Instagram groups enjoyed the same level of technical vocabulary ability prior to the main study, but after using different mobile's apps, the Instagram group outperformed the Adobe Connect group significantly on the posttest of technical vocabulary.

The statistical analyses performed in this study manifested that in both of the experimental groups, there was a variation between the participants' scores in the pretests and the posttests. Though this difference was significant in both of the groups, comparing the groups with each other reveals that the changes in the posttest scores of the group in which Instagram was used was more substantial than the group in which Adobe Connect was employed.

The effects of the two different mobile apps on individuals' development of technical vocabulary ability were mainly scrutinized in the current study. The development of technical vocabulary was examined by comparing the score differences obtained from the technical vocabulary test between the two experimental groups in which the two mobile apps of Instagram and Adobe Connect were deployed as a means of teacher-student communication. The quantitative analysis resulting from the independent *t*-test indicated that there was a statistically significant difference (t=6.047, p<.05) on the posttest results between the two groups. The findings of the present research indicate that Instagram application creates a favorable learning condition for the students. According to the statistical analyses performed in this study, it is suggested that the teaching styles of technical vocabulary using Instagram and Adobe Connect apps can be considered as a valid tool for improving learners' knowledge of technical vocabulary,

but if a teacher has an option to choose among these two, Instagram can render better results when the students' vocabulary learning is concerned.

**4. Conclusion**

In today's era, the COVID-19 pandemic has changed education dramatically and made online teaching an obligatory teaching system. Online teaching is no longer a supplementary approach or a blending method. Even before the onset of the pandemic of COVID-19, the role of technology in language learning got scholars' attention and it was observed that social networking and online collaboration affected foreign language learning (Reinhardt, 2019). Some advantages of mobile such as flexibility, low cost, small size and user-friendliness (Huang *et al*., 2012) affect language learning and teaching. It is over a decade that researchers are exploring the impact of mobile technology on language learning and many studies have indicated the effectiveness of such tool (Abdous *et al*., 2012; Chen & Chung, 2008; Cheng *et al*., 2010; de Jong *et al*., 2010; Hsu *et al*., 2008; Huang & Sun, 2008; Hwang & Chen, 2011; Kukulska-Hulme & Shield, 2008; Oberg & Daniels, 2012; Petersen *et al*., 2011; Sandberg *et al*., 2011; Thornton & Houser, 2005).

The study attempted to examine the effectiveness of Adobe Connect and compare it with a more popular application, that is, Instagram to see if there is a significant difference between their efficiency. When the quality of teaching and learning is concerned, there has always been a necessity of creating a better substitution in order to promote individuals' learning. As observed, both Adobe Connect and Instagram were considered effective tools for teaching and learning technical vocabulary. Going into more details, however, the statistical analysis indicated that there was a significant difference between Adobe Connect group's means on the posttest of technical vocabularies and those of the Instagram group. Such a finding might be explained by the fact that Instagram, in comparison with Adobe Connect, created a more favorable condition for the learners to notice both the target items and their linguistic weaknesses. Moreover, factors such as the nature of the target item, learners' needs and interest, the speed of the Internet in Iran, application popularity, and practicality made Instagram a more effective tool for vocabulary learning.

The obtained results revealed the necessity of choosing an application which best fits across the learners' needs and interest. If policy makers and other stakeholders be aware of the applications which work more effectively regarding language learning, then the learners would also benefit more greatly from their time, energy and costs they have devoted. Moreover, teachers and instructors can make use of applications that profit educational techniques and is favored by their learners. They can create new situations for the students and in so doing learning would be more motivating. It can be pointed out that if applications are chosen more precisely then technical vocabulary learning would be more interesting and more ' input' will turn into 'intake'. To summarize, the suggested features can provide helpful insights for educators, policy makers, and language instructors to design innovative syllabi for teaching different target linguistic forms and profit the learners to acquire language more efficiently.

As the field of English for Specific Purposes (ESP) is growing more and more in professional development programs, issues influencing students' success in learning technical vocabulary become more salient. Despite the achieved upshots of the present research on the mastery of technical vocabulary, there are areas that are worth to be addressed and investigated more precisely. When factors influencing individuals' leaning is concerned, one may concentrate on two main categories, that is, factors that are available in the environment and factors that pertain to the learners themselves. With respect to the former, it is noteworthy to mention that the focus of this study was merely on technical vocabulary learning and other areas of target forms such as phrasal verbs, idioms, or collocations were not involved. In addition, depending on the nature of the targeted structure, various methods and techniques can best be used through Instagram tools. Hence other tasks and activities can be employed using various features of both applications such as live, video call, video conference are also suggestive of further avenues to explore in future. On the basis of the latter, factors like learners' background knowledge in the field, their personal experience, and the learning strategies that most successful learners use are suggestive for further research in further.

Regardless of the main variables of interest in this study, the influence of some unwanted factors may have affected the result of the study. Conducting the study with other populations regarding their L1, level of proficiency, educational background, learning environment, and other variables may lead to quite different results. Each of these unwanted factors can be changed for further research. Knowledge construction or higher order thinking are not still at the locus of scholars' attention. Consequently, still there is a very large space for improvement and development in the field of second or foreign language learning with respect to the use of mobile devices. Moreover, researchers of the field need to make a shift from "knowing" and "comprehending" to "analyzing" and "synthesizing" and then make learner controlled activities in which learners reflect, construct knowledge, and solve problem (Chung et al., 2019).

It is also noteworthy to maintain that mobile-assisted language learning, like any other classroom procedure, has its own difficulties and problems. Employing digital technology in language learning and teaching classes highly

depends on teachers' proficiency to introduce it without negatively influencing the richness of the classroom setting and students' attention to the follow of events. (Pedro et al., 2018). Moreover, employing a variety of different devices (such as smartphones, MP3 or MP4 players, iPod touch, and tablets) can make a mess. Early projects focused more on teacher-centered approaches based on which teachers, for instance, send messages to students periodically with word lists, sample sentences, or study reminders so that they could learn vocabulary. In the age of smartphone apps, however, teacher-centered approaches as such are extremely limited pedagogically. Evaluating MALL projects, one need to take the context of use and the timeframe into account (Godwin-Jones, 2017).

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