The Effect of an Electronic Collocation-Based Instructional Program on Jordanian EFL Tenth Grade Students' Word Knowledge

فاعلية برنامج الكتروني لتدريس التلازم اللفظي في اللغة الانجليزية في معرفة المفردات لدى طلاب الصف العاشر في الأردن

Marouf Muhammad Assaf   Dr. Dina Abdulhameed Al-Jamal,
Dr. Ebtesam Qassem Rababah
Yarmouk University, Jordan

Abstract: This quasi-experimental study investigated the effectiveness of an electronic collocation-based instructional program on Jordanian EFL tenth grade students' word knowledge. Two sections, of 25 students each, from a government school in Irbid were assigned randomly as experimental and control groups. A word knowledge pre-test, the first part of which measured word meaning and the second part assessed word collocation, was administered to find out whether the two groups were homogeneous before implementing the program. Lexical collocations in Action Pack 10 were identified, through a content analysis of certain reading passages, and those collocations were taught to the experimental group through Quizlet: a flashcard mobile application. The control group received no collocation instruction. After treatment, the two groups took a word knowledge post-test. The findings indicated that the experimental group outperformed the control group in the overall word knowledge test and in each part of the test: word meaning and word collocation.

Keywords: e-learning, collocations, word knowledge, EFL

الملخص: هدفت الدراسة إلى الكشف عن أثر برنامج الكتروني لتدريس التلازم اللفظي في اللغة الانجليزية في معرفة المفردات لدى طلاب الصف العاشر في الأردن. شارك في الدراسة خمسون طالبا من شعبتين في مدرسة حكومية في اربد، وتم تعيين الشعبتين عشوائيا كمجموعة تجريبية ومجموعة ضابطة تضم كلٌ منهما خمسة وعشرين طالبا. أجري للمجموعتين اختبار قَبلي في معرفة المفردات لقياس تجانس المجموعتين قبل تطبيق البرنامج. وتكوّن الاختبار من قسمين: الأول يقيس معرفة معاني الكلمات والثاني يقيس معرفة المتلازمات اللفظية . قام الباحث بتحليل محتوى بعض نصوص القراءة في كتاب اللغة الانجليزية للصف العاشر للكشف عن المتلازمات اللفظية ، والتي تم إدراجها ضمن مجموعات في تطبيق كويزلت Quizlet الالكتروني، وتم تدريس هذه المتلازمات اللفظية للمجموعة التجريبية من خلال التطبيق الالكتروني، أما المجموعة الضابطة فلم تتلقَّ أي تدريس قائم على المتلازمات اللفظية. وبعد انتهاء البرنامج خضعت المجموعتان لاختبار بعدي في معرفة المفردات، وأشارت نتائج الاختبار إلى تفوق المجموعة التجريبية على الضابطة في اختبار معرفة المفردات ككل، وكذلك في جزأي الاختبار: معاني الكلمات والتلازم اللفظي للكلمات, كلٌ على حدة.

الكلمات المفتاحية: التعلم الالكتروني، المتلازمات اللفظية، معرفة المفردات، اللغة الانجليزية كلغة أجنبية

Introduction

In Jordan, English as a foreign language (EFL) is a basic school subject and a mandatory course in colleges and universities. It is also a fundamental requirement for those seeking career development, effective communication and easy access to information. Thus, serious EFL learners are expected to work assiduously to hone their language production through speaking and writing skills and language comprehension through listening and reading skills.

Word knowledge, which is the focal point of this study, is one of the language aspects or components that are instrumental in language acquisition and might promote the development of language skills. The mastery of language skills relies heavily on having a rich vocabulary or mental lexicon enough to intelligibly perceive and produce messages. Coady and Huckin (1997) stated that vocabulary is central to language and crucially important to the language learner. Vocabulary is defined by Richards and Schmidt (2010) as a set of lexemes, which embrace single and compound words and idioms.

Word knowledge is not limited to identifying word meanings. Rather, it is multi-faceted; there are various dimensions or levels related to word knowledge. For Thornbury (2002), word knowledge entails knowing the word's spoken and written forms, its meaning(s), its connotations (if any), whether it is specific to a certain register or style, its grammatical characteristics, its common collocations, its derivations and its relative frequency. For Wallace (1982), to know a word might mean the ability to recognize it in both spoken and written forms, recall it whenever needed, relate it to a particular concept or thing, use it in a correct grammatical form, pronounce it clearly, spell it properly, use it in the correct collocation, use it at a suitable formality level, and be familiar with its connotations and associations. There are three general components of word knowledge model, according to Nation (2001): form (written, spoken, word parts), meaning (linking form with meaning, concept and referents, associations) and use (grammatical functions, collocation and constraints on use such as register).

These approaches to components of word knowledge might point to the complexity of what it entails to know a word. Morgan and Rinvolucri (2004) emphasized that vocabulary acquisition, is a branching, not linear, process, and it is also personal, i.e. closely related to one's past and present experience. The two components of word knowledge germane to the purpose of the current study are word meaning and word collocation.

The core component of word knowledge is the ability to say or recall what a word means. A reliable, fertile source for word meaning is a good dictionary. Checking spelling and learning the meaning of words, for Jackson (1988), are the most common reasons for consulting a dictionary.

The second component of word knowledge and the base of the instructional program in this study is word collocation: the frequent co-occurrence of words. Firh (1957) was the first to use this term in its linguistic sense. Jackson (1988) defined collocations as combinations in which words keep company with other specific words on a regular basis. The verb collocate is from Latin collocatus, which is the past participle of collocare, which is made up of com- 'together' plus locare, 'place' (The New International Webster's Comprehensive Dictionary of the English Language, 1998).

It is insufficient for EFL learners to learn word definitions without some additional facts about these vocabulary items. Knowing both how a word is used in context and what company a word keeps might be an essential component of word knowledge. Familiarized with word collocations, EFL learners do not need to reconstruct the language whenever they want to say something, but rather they opt for collocations as pre-packaged items (Carter & McCarthy, 1988).

For example, having known the meaning of the verb to insist, the learner also needs to get acquainted with the verb collocational field in order to use it properly and precisely. McIntosh, Francis and Poole's (2009) Oxford Collocations Dictionary for Students of English lists some adverbs that can co-occur with insist: firmly, stubbornly, gently, and repeatedly. Keeping a good grip on a word's collocational fields or range is an effective way to make one's language production natural and precise.

Each collocation is made up of at least two words. Sinclair (1991) used the term node for the word being studied and collocates for the words surrounding the node. For example, in these phrases: a volunteer army, a disciplined army, to deploy an army and an army corps the word army is the node, whereas the other words are the collocates.

Collocational range or field is a group of words that usually co-occur with a certain word. It is one way to differentiate between words with similar meaning. For instance, the two nouns sight and view carry similar meaning. The adjective breathtaking collocates with either noun, so it sounds natural to say a breathtaking sight or a breathtaking view. However, the phrase sights and sounds is collocation, while *views and sounds is miscollocation.

Collocations have established idiomatic semantic relations because they are often placed together (Bussmann, 2006). Of idiomatic language areas, collocation is regarded as one of the most significant, and therefore, ignoring collocations would result in failure to express difficult ideas and thoughts in a simple but precise fashion (Hill, 2000). However, such idiomaticness is in its broad sense: typicality to a language. It does not necessarily indicate that collocations are pure idioms, in the narrower sense of idioms as fixed expressions usually carrying figurative meaning. Rather, according to McKeown and Radev (2000) and Duan and Quin (2012), collocations are placed somewhere between the two extremes: idioms and free-word combinations.

For example, the 'tongue' idiom: to have a loose tongue is a fixed expression, and its meaning, to talk too much about private issues, is not obtained from the meaning of its individual words. On the other hand, the 'tongue' collocation: he stuck his tongue out is less fixed and its meaning is more direct. Nevertheless, collocations do not always carry direct meaning. The words surrounding the node, i.e. collocates, might be themselves used figuratively. As Deignan (2005) noted, collocations might convey primarily literal meaning, such as purchase price, metaphorical meaning, like heavy price, or both literal and metaphoric meanings, as in high price.

Benson, Benson and Ilson (1997) classified collocations into lexical collocations, those combining lexical or dominant components, and grammatical collocations, which entail lexical plus grammatical words. In light of this dichotomy, total darkness is a lexical collocation, while in the darkness is a grammatical collocation. Further, collocations can be categorized on the basis of the part of speech of the components making up the combination. Common combinations include: an adjective and noun (a radical shift), a noun and noun (incident rate), a verb and noun (to raise one's esteem), an adverb and adjective (seriously mistaken), a noun and verb (the eyelids droop), a verb and adverb (to punish physically), a preposition and noun (without distraction), a noun and preposition sort of), a verb and preposition (to immerse in), an adjective and preposition (doubtful about) and phrases (pain and anguish).

Collocations can be also classified as strong and weak. Conzett (2000) stated that strong collocation means that the presence of a certain word calls for the other word to be present, while weak collocates are expected to vary a lot, and there are other collocations lying between the strong and weak ones. Hill and Lewis (2002) pointed out that storing and using strong collocations, such as to impose rigid discipline and to declare war, will probably make one's English sounds natural. Other strong collocations may include: to whisk an egg, to commit a murder, absolute authority and curly hair.

There is a close bond between collocations and the lexical approach to language teaching. The underlying reason for second language learners failing to function successfully in real-life situations, according to Farghal and Obiedat (1995), is the view of lexis as both holding a second rank in favor of syntax and being a means to an end, not an end by itself. The lexical approach to language teaching accentuated the significance of collocations. It suggested that, according to Lewis (1997), language is not made up of grammar and vocabulary but often of prefabricated multi-word units, of which collocations and fixed expressions are the most central. Fluency, in the eyes of this approach, relies heavily on the acquisition of chunks, which are fixed and semi-fixed word combinations (Debabi & Guerroud, 2018).

Electronic learning (e-learning) was the mode used to teach collocations in this study. The term suggests utilizing information and communications technology to assist learning. Hence, any learning facilitated and backed by electronic devices or services might fall under the umbrella of e-learning. E-learning goes back the 1980s and 1990s (Sekhon & Hartley, 2014), but as a term, it was first used in the mid1990-s (Garrison, 2011).

E-learning might be of benefit to teachers and learners. E-learning environments have the potential of tailoring learning contents to suit the learner's different cognitive styles, thereby making it easy for learners to commit items to memory (Palo, Limone, Monacis, Ceglie & Sinatra, 2018). Catering to learners' individual differences and learning styles could be one of the salient features of e-leaning environments. Also, learners can have the chance to tune their pace of learning (Horton, 2003). This way, learner autonomy makes e-learners feel in control of their own learning. They may skip easy materials and spend more time studying thorny points. Kramer and Schmidt (2001) said that technology offers different media types that can be networked to hypermedia educational materials and facilitates synchronous and asynchronous communication, which is likely to shorten the physical distance between teachers and learners. Providing practice with automated feedback, real-time communication, educational route tailored to learner's responses and simulation programs are four effective features unique to e-learning (Clark and Mayer, 2008).

However, not everything in the garden is rosy. For Tabot, Oyibo and Hamada (2013), the lack of body language and the high costs of obtaining supplies and effectively using technology infrastructure are among the major drawbacks from which e-learning suffers. Moreover, there are some teachers who lack the expertise to integrate technology into

their teaching, and there are certain learners who find it difficult to be engaged if there is no human feedback and interaction (Turban, Whiteside, King and Outland, 2017).

As a subdivision of e-learning, learning supported by personal digital assistants (PDAs) and smart mobile phones in particular is called mobile learning (m-learning). Despite being a relatively new field, m-learning has attracted a lot of research attention (Boylan, 2018). Since many people own a smart phone or tablet, m-learning has become part of their daily lives. Indeed, m-learning is now a specialized field that is very closely connected to people's everyday life and work (Kukulska-Hulme, 2005).

Mobility could be a distinctive feature of m-learning. Thanks to m-learning, one could learn anytime and anywhere without embarrassment, and this capacity is not present in other forms of e-learning (Marsom and Ismail, 2010). For El-Hussein and Cronje (2010), mobility in education entails mobility of technology, mobility of learning and mobility of learners. Martin, McGill and Sudweeks (2013) highlighted that mobility is a key motivator for m-learning.

With regard to making use of mobile devices to learn language, mobile-assisted language learning (MALL) could be a move in the right direction. MALL is a term coined by Chinnery in 2006. MALL has emerged, according to Kim (2016), as a principal constituent of computer-assisted language learning (CALL) in a brief period of time. As Smith (2016) noted, MALL is grabbing a lot of attention. Copiousness of mobile applications (apps) has been instrumental in moving language learning to a leading position in m-learning (Diaz-Vera, 2012). There are many smart phone apps that facilitate language learning and these apps are not restricted to the English language. Godwin-Jones (2011) maintained that flashcard apps, such as Anki and Quizlet, have achieved remarkable progress.

Statement of the problem

Based on the researchers' teaching experience, Jordanian EFL learners sometimes find it difficult to properly use vocabulary in writing and speaking. Moreover, the researchers' keenness on the intriguing topics of collocations and MALL is another primary underlying motive for investigating their potential effectiveness on improving students' word knowledge. Finally, in this age of rapid, substantial technological innovations, utilising smart phone apps and gadgets in language teaching and learning might produce promising results.

Purpose of the study

This study aims at investigating the potential effect of an electronic collocation-based instructional program on enhancing Jordanian EFL tenth grade students' word knowledge.

Question of the study

The study aims to answer the following question: Are there any statistically significant differences between the mean scores of the experimental group and the control group on the word knowledge post-test that are attributed to an electronic collocation-based instructional program?

Significance of the study

The present study, targeting Jordanian EFL tenth grade students, has added pieces of research into the potential effect of both explicit collocation instruction and technology on foreign language proficiency. No previous study, to the best of the researchers' knowledge, has measured the influence of an electronic collocation-based instructional program on enhancing word knowledge, and this is a significant breakthrough this study is bound to make.

The findings of the present research will probably be of particular interest to mobile phone app developers, EFL curriculum designers, educational policy makers as well as EFL teachers and students. Also, the study will probably raise EFL teachers' awareness of the significance of incorporation of technology into foreign language teaching and learning.

Procedural Definitions

In this study, word knowledge is comprised of two dimensions: knowing the word's meaning(s) and knowing its common collocations. Word knowledge in the present study was measured in terms of how many questions relating to word meanings and common collocations the participant answers correctly.

Collocation refers to the way in which words co-occur on a regular basis. This study dealt with lexical collocations, which typically consist of content words: verbs, nouns, adjectives and adverbs, identified through a content analysis of certain reading passages in Action Pack 10.

In this study, an electronic collocation-based instructional program is a nine-week program, designed by the researchers, that makes use of a MALL flashcard app: Quizlet. The program consisted of twelve collocation sets that the researchers have identified and fed into the Quizlet app.

Limitations of the study

The present study dealt with lexical collocation presented in Action Pack 10, to the exclusion of grammatical collocations. Word knowledge was limited to identifying the word meaning and its common collocations. The other components of word knowledge, like connotations and derivations, were left out of this study.

This study was limited to the students in two tenth grade sections in Ammar Bin Yasser School, Irbid, and the treatment was restricted to nine weeks in the first semester of the scholastic year 2019-2018. Targeting different participants or changing the treatment time or duration might yield different results.

Empirical studies

To the best of the researchers' knowledge, there has been no empirical study that used an electronic program or app, such as Quizlet, to teach collocations. However, few studies, Vargas, 2011; Lees, 2013; Tosun, 2015; Barr, 2016; Baptist, 2018, used Quizlet to teach EFL learners English vocabulary items, not collocations, in order to explore the relationships between a Quizlet-based program and learners' vocabulary development.

Pertinent to the effect of non-electronic collocation-based instruction on word knowledge, there have been two studies, to the best of the researchers' knowledge. These studies have been outlined below.

Hsu (2010) explored the effect of direct collocation instruction on Taiwanese English majors' reading comprehension and vocabulary learning. One hundred and two English majors studying at the National University of Science and Technology were divided into three groups based on their academic levels. Each of the three groups received a vocabulary pre-test, three different types of instruction, namely single-item vocabulary instruction, lexical collocation instruction and no instruction, along with three delayed vocabulary tests. The results indicated that the direct collocation instruction promoted the participants' performance on the three vocabulary recall tests, and that lower level English majors, in particular, made a considerable progress in their reading comprehension. Hsu recommended that more extensive study should be carried out.

Kasahara (2011) investigated whether learning a known-and-unknown word combination, which is a two-word collocation of a familiar word and a new word, is better in terms of retention and retrieval of meaning than learning a single unfamiliar word. His study targeted 66 Japanese university students. A vocabulary size test and recall tests were used as measuring instruments. Kasahara concluded that using a two-word collocation of a known word and an unknown word could be an effective way of retaining and retrieving the meaning of the target word.

Since the studies that used a flashcard app, such as Quizlet, have not been concerned with teaching collocations, and those studies tackling collocation have not incorporated technology into language instruction, this study attempted to bridge the gap between MALL and collocation-based instruction. This endeavor might be a major contribution that adds to MALL and collocation instruction literature.

The two studies looking into the effect of collocation instruction on vocabulary learning, Hsu, 2010; Kasahara, 2011, came to the conclusion that there was an effect of direct collocation instruction on vocabulary development. The present study was carried out to confirm or revise that finding, but with the technological element included. Moreover, the two studies targeted university students, while this study was concerned with a different age group: tenth grade students.

 As for location, the present study was done in Jordan, which contributes to the novelty of this study. Pertaining to variables, the present study targeted two dimensions of word knowledge: word meaning and word collocation, but the previous studies tackled only word meaning.

Content analysis of lexical collocations

Since the instructional program in this study is based on lexical collocations, it was vital for the researchers, at an early stage of the study, to conduct a content analysis of lexical collocations in Action Pack 10. The purpose of this content analysis was identifying lexical collocations in certain reading passages in Action Pack 10 and deciding whether the number of the collocations identified could form a basis for an instructional program.

The identification of lexical collocations in this content analysis was based on two criteria. First, they should be listed in either or both of the following significant collocation dictionaries: McIntosh, Francis and Poole's (2009) Oxford Collocations Dictionary for Students of English and Longman Collocations Dictionary and Thesaurus (2013). Second, they should fall under one of the following seven combinations: An adjective and noun (a live show), a noun and noun (personality traits), a verb and noun (to furl an umbrella), a noun and verb (a crisis arises), a verb and adverb (to walk briskly), an adverb and adjective (desperately nervous) and short phrases (pale and drawn).

In the two dictionaries, there are some collocations listed under preposition category, such as fascination for (something) and to disapprove of (something). Those are not considered in the study because they belong to grammatical, not lexical, collocations.

All the eleven reading passages in Module 2 and the first two reading passages in Module 3 of the Student's Book (SB) and Activity Book (AB) of Action Pack 10 served as the units of analysis. However, any texts belonging to grammar, vocabulary or listening activities were excluded.

The results showed that the thirteen reading passages contain ninety lexical collocations (Appendix A), and this number is adequate for the purpose of the instructional program. The ninety target lexical collocations (Appendix B) have been fed into 12 Quizlet sets by the researchers. (One Quizlet set consisted of collocations from two reading passages).

Research Methods and Procedures

Participants

Two intact tenth grade sections, of 25 students each, enrolled at Ammar Bin Yasser Secondary School for Boys in Irbid City, Jordan were selected conveniently since the first researcher is an English language teacher in that school. The participants are 15-year old male students who have been studying EFL since the first grade, at the age of six. The two sections were randomly assigned as experimental and control groups. The experimental group used the Quizlet mobile app to learn lexical collocations. The control group received conventional classroom instruction, with no emphasis on collocations.

Design and variables of the study

The present study used the quasi-experimental research design and entailed two variables. The independent variable was instruction, and it had two levels: an electronic collocation-based instruction and conventional instruction. The dependent variable was the participants' performance on the overall word knowledge post-test, and on each part of the test: word meaning and word collocation.

Instruments

The word knowledge test (Appendix C) is made of two parts. Each part targets one specific dimension of word knowledge. The first part, which is word meaning, requires the participants to match the target words with their clues. In the second part, word collocation, the participants are requested to select the items that best collocate with the given words. Each part is made of ten items, one mark each. The total possible score is 20. Both the experimental and control groups took a word knowledge pre-test to find out if the two groups were homogenous in terms of their word knowledge (Table 1).

Table 1: Equivalence tests

Dimension	Group	N	Mean	Std. Dev.	t	Sig.
Word meaning pre-test (out of 10)	Experimental	25	1.56	1.960	-1.543	0.129
	Control	25	2.32	1.492		
Word collocations pre-test (out of 10)	Experimental	25	4.80	2.062	-0.357	0.722
	Control	25	5.00	1.893		
Overall word knowledge pre-test (out of 20)	Experimental	25	6.36	3.328	-1.135	0.262
	Control	25	7.32	2.610		

Table 1 shows that there are no statistically significant differences at ($\alpha=0.05$) between the experimental group's and control group's pre-test scores on overall word knowledge pre-test, and on each part of the test (p>0.05). Thus, the two groups' word knowledge dimensions were equivalent before implementing the instructional program.

Content validity of the tests and instructional program

The word knowledge test and the instructional program (outlined below) were given to a validation jury of university professors, English language supervisors and experienced English language teachers. The jury validated the test and instructional program.

Reliability of the test

A pilot sample of 15 tenth-grade students, other than those in the experimental and control groups, took the word knowledge test. To ensure that the tests' items correlate to each other, internal consistency reliability using Cronbach Alpha test was calculated. Table 2 presents the results.

Table 2: Internal consistency of the word knowledge test

Dimension	No. of items	Cronbach's Alpha
Word meaning	10	0.82
Word collocations	10	0.84
Overall word knowledge test	20	0.88

Table 2 demonstrates that the alpha coefficient for the overall word knowledge test and its parts range from 0.82 to 0.88. This indicates that the items on the test have relatively high internal consistency.

For the purpose of obtaining a coefficient of stability, the same pilot sample retook the same test two weeks after the first test-taking session. Pearson correlation coefficient was computed to find out about the correlation between the test takers' scores in the two sessions. The results are shown in Table 3.

Table 3: Test-Retest reliability of the word knowledge test

Dimension	N	Pearson coefficient
Word meaning	15	0.83
Word collocations	15	0.84
Overall word knowledge test	15	0.86

Since the correlation coefficient is high, as shown in Table 3, there are very strong positive correlations between the scores in the two sessions on the test. That suggests that the responses of the pilot sample are consistent and the word knowledge test is highly reliable.

The electronic collocation-based instructional program

To achieve the purpose of the study, the researchers designed an electronic collocation-based instructional program. The key objective of this nine-week program is to assist participants in getting familiar with those collocations in their textbook with the aid of technology, provide students with an intriguing mobile learning experience and evaluate the potential effect of the program on students' word knowledge. The researchers have already identified the collocations, by conducting a content analysis, created collocation sets and fed them into Quizlet.

As for teaching the control group, their teacher neither stressed to the students the importance of collocation in language nor drew their attention to those lexical collocations lying in the reading passages. Rather, teaching the control group was only based on the Teacher's Book guidelines.

With regard to teaching the experimental group, the first researcher, who taught the experimental group, introduced Quizlet to the students. Then, he helped them to download the app on their smart phones/tablets, create a free account and locate the target collocation sets. He also gave them a hands-on training to ensure that they were completely ready to take full advantage of the mobile app.

During treatment, once a reading activity was done in class, the experimental group, under close supervision of their teacher, located the corresponding collocation set in the mobile app, learned these collocations in that reading passage and monitored their own progress. On average, they practiced two collocation sets per week.

During their practice, the participants in the experimental group made use of the five engaging Quizlet modes, Learn, Flashcards, Write, Match and Test. The Quizlet Learn Mode facilitates learning a set of flashcards by devising a personalized study plan depending on the user's knowledge of the set and helps the user to keep learning until they attain mastery (Studying with Learn mode, 2019).   The Flashcards Mode lets the user study the sets as flashcards (Studying with Flashcards mode, 2019). Here, the user flips between cards in the same study set. The Write Mode assesses how well the user is familiar with the items, based on whether the user types the missing item accurately (Studying with Write mode, 2019).   In the Match Mode, learners are required to match the items with their definitions or match the two sides of the flashcard as quickly as possible (Playing Match, 2019). Finally, the user could practice before an exam making use of the Test Mode to ensure they have got a grip on the target items (Studying with Test mode, 2019). It is worth noting that most of the Quizlet tools and modes are customizable, and the user could tailor each mode to suit their objectives, preferences and learning styles.

When the instructional program was over, a word knowledge post-test was administered to the experimental and control groups. Then, the results of the test were presented and statistically analyzed. Finally, the findings were discussed and pedagogical implications were put forward.

Findings and Discussion

The question of the study reads as: Are there any statistically significant differences between the mean scores of the experimental group and the control group on the word knowledge post-tests that are attributed to an electronic collocation-based instructional program? To answer this question, the researchers calculated the means and standard deviations of the participants' performance on the word knowledge post-test. The results are shown in Table 4.

Table 4: Means and standard deviations of the participants' performance on the word knowledge post-test

Test Dimension	Group	N	Pre-test		Post-test	
			Mean	Std. Dev.	Mean	Std. Dev.
Word meaning (out of 10)	Experimental	25	1.56	1.96	5.60	3.43
	Control	25	2.32	1.49	2.52	2.38
Word collocation (out of 10)	Experimental	25	4.80	2.06	6.84	2.93
	Control	25	5.00	1.89	5.28	2.26

Table 4 shows that the mean score of the experimental group on the word meaning post-test (5.6) was higher than that of the control group (2.52). Regarding the participants' performance on the word collocation post-test, the mean score of the experimental group (6.84) was also higher than the mean score of the control group (5.28). The researchers used MANCOVA in order to address the question of the study. The results are presented in Table 5 below.

Table 5: MANCOVA results of the participants' performance on the word knowledge post-test

Test Dimension	Group	N	Pre-test		Post-test	
			Mean	Std. Dev.	Mean	Std. Dev.
Word meaning (out of 10)	Experimental	25	1.56	1.96	5.60	3.43
	Control	25	2.32	1.49	2.52	2.38
Word collocation (out of 10)	Experimental	25	4.80	2.06	6.84	2.93
	Control	25	5.00	1.89	5.28	2.26

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Wilks' Lambda
Word meaning pre-test	Word meaning	25.62	1	25.62	3.590	0.064	0.072	1.831
	Word collocation	3.309	1	3.309	0.565	0.456	0.012	
Word collocation pre-test	Word meaning	38.664	1	38.664	5.418	0.024	0.105	5.290
	Word collocation	43.695	1	43.695	7.457	0.009	0.140	
Group	Word meaning	146.512	1	146.512	20.531	0.000	0.309	11.440
	Word collocation	37.744	1	37.744	6.442	0.015	0.123	
Error	Word meaning	328.258	46	7.136				
	Word collocation	269.533	46	5.859				
Corrected Total	Word meaning	536.82	49					
	Word collocation	358.82	49					

Table 5 shows that f equals 20.531 for word meaning and 6.442 for word collocations, and these values are related with significance level that =0.000 at (α = 0.05), which means that there is a significant difference on the participants' performance on the word knowledge post-test. In order to find out this difference is in favor of which group, the researchers calculated the adjusted means and standard errors for the word knowledge post-test. Table 6 shows the results.

Table 6: Adjusted means and standard errors of the participants' performance on the word knowledge post-test

Dependent Variable	Group	Mean	Std. Error
Word meaning	Experimental	5.81	0.54
	control	2.31	0.54
Word collocations	Experimental	6.95	0.49
	Control	5.17	0.49

Table 6 shows that the mean differences were in favor of the experimental group in each part of the word knowledge test: word meaning and word collocations, because the means of the experimental group were higher than those of the control group. That indicates that there is an effect of the electronic collocation-based instructional program on enhancing Jordanian EFL tenth grade students' word knowledge post-test.

Then, the researchers calculated the means and standard deviations of the participants' total/overall performance on the word knowledge post-test. The results are presented in Table 7.

Table 7: Means and standard deviations of the participants' total performance on the word knowledge post-test

Group	N	Pre-test		Post-test	
		Mean	Std. Dev.	Mean	Std. Dev.
Experimental	25	6.36	3.33	12.44	5.37
Control	25	7.32	2.61	7.76	3.54

Table 7 shows that the mean score of the experimental group on the overall comprehension post-test (12.44) was higher than that of the control group (7.76). Then, ANCOVA was used and the results are shown in Table 8.

Table 8: ANCOVA results of the participants' total performance on the word knowledge post-test

Source	Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Pre-test	283.721	1	283.721	18.808	0.000	0.286
Group	362.974	1	362.974	24.062	0.000	0.339
Error	708.999	47	15.085			
Corrected Total	1266.5	49				

Table 8 shows that f equals 24.062 for the total performance on the word knowledge post-test, and this value is related with significance level that =0.000 at (α=0.05), which means that there is a significant difference on participants' total performance on the word knowledge post-test. To find out this difference is in favor of which group, the researchers calculated the adjusted means and standard errors pertinent to the total performance on the word knowledge post-test. Table 9 shows the results.

Table 9: Adjusted means and standard errors of the participants' total performance on the word knowledge post-test

Group	Mean	Std. Error
Experimental	12.83	0.78
Control	7.37	0.78

Table 9 shows that the mean differences in the overall word knowledge post-test were in favor of the experimental group because the mean of the experimental group is higher than that of the control group. That indicates that there is an effect of the electronic collocation-based instructional program on improving Jordanian EFL tenth grade students' word knowledge.

As shown above, the experimental group, which received direct and explicit collocation instruction through Quizlet, outperformed the control group, which received no collocation-based instruction, in overall word knowledge post-test and in each part of the test: word meaning and word collocation. This result might indicate that familiarity with lexical collocations can be one of the gateways to broadening word knowledge.

The results of the word knowledge post-test lend support to the previous research into the topic and are particularly consistent with the studies conducted by Hsu (2010) and Kasahara (2011). Hsu (2010) found that the direct collocation instruction promoted the participants' performance on the all vocabulary recall tests. Kasahara (2011) came to the conclusion that using a two-word collocation of a known word and an unknown word might constitute an effective way of retaining and retrieving the meaning of target words. Therefore, the findings of this study increase the generalizability of the role of collocation-based instruction in improving word knowledge.

A possible explanation of the superior performance of the participants in the experimental group on the word knowledge post-test is that they were made aware of collocations and became well acquainted with them. At the commencement of instructional program, the participants in the experimental group were not familiar with the concept of collocations. So, an early procedure was introducing the term collocations to the experimental group, demonstrating how collocations were significant in language production and comprehension, offering some examples of collocations, and commenting on common learner's errors in collocations. To learn any language, according to Verspoor and Tyler (2009), it is necessary to memorise an extensive collection of lexical items. The results of this study likewise support Woolard's (2000) belief that learning more vocabulary items is not just learning new words, but it entails learning known words yet in new combinations. The results of the current study moreover substantiate Kasahara's (2011) conclusion that word collocation of a known word and an unknown word could be an efficacious way of retaining and retrieving word meanings. In this respect, Aitchison (1994), considered network-building as one of the three tasks, in addition to packaging and labeling, that aid children in developing word meaning. Learning vocabulary, therefore, is not limited to learning new words or new meanings of known words; rather, familiarity with the word collocations is a constituent element in broadening one's lexicon.

Another plausible factor contributing to the experimental group's good performance in the word knowledge is their involvement in an e-learning environment. During the training, the researchers noticed such involvement as they interacted by sharing responses or practicing new words. In this respect, Holmes and Gardner (2006) stated that virtual environments through e-learning are likely to facilitate accessing, sharing, increasing and applying new knowledge and information. Similarly, Clark and Mayer (2008) listed four effective features brought by e-learning, including offering practice with automated feedback and instruction tailored to learner's responses and needs. These two attributes were present in the electronic instructional program.

Another possible explanation for the performance of the experimental group on the word knowledge post-test is motivation, which is, for Martin, McGill and Sudweeks (2013), an underlying motivator for m-learning, and for Laurillard (2007), a distinctive feature offered by m-learning. The participants in the experimental group made use of all of the five learning modes of Quizlet, customized the modes the way they liked and allotted each mode the amount of time they preferred. For Brown (2001), motivation reaches its peak when a learner has the ability to make choices.

A further explanation for the performance of the experimental group could be attributed to the instructional and training program per se. Here, the researchers introduced the mobile flashcard app, Quizlet, to the experimental group, helped them to download and install the program and gave them a hands-on training on how to sign up, locate the target collocation sets and use the five modes of the app. During treatment, the researcher, in each reading lesson, directed the students' attention to the collocations in the text. In this regard, Lewis (2000) maintained that it is necessary for EFL learners to notice words with those ones they naturally occur with. The participants, then, used Quizlet on mobiles or tablets to practice those collocations and measure their progress. When Quizlet is combined with proper training, according to Cunningham (2017), it might enhance both learner autonomy and involvement in language classroom; luckily, this was the case in the present study.

Another plausible explanation of the superiority of experimental group's performance over that of the control group is the using the Quizlet app. It is an engaging app that provides learning and teaching tools for teachers and students. Quizlet offers free convenient study tools for learners in five engaging Quizlet modes, Learn, Flashcards, Write, Match and Test. Most of the Quizlet tools and modes used during the training process were customizable, and each student was able to tailor each mode to suit his objectives and preferences. Since students can flip through the flashcards with the hand, see and read the words on screens and hear the pronunciation of the words, the app responded to different learning styles and, thereby, facilitated language learning.

The findings of the present study are in accord with the lexical approach to teaching that lays great stress to multi-word units and particularly collocations in language production and comprehension. Lewis (1993) stressed that familiarizing learners with chunks and encouraging them to identify chunks in texts are pivotal activities in language teaching. In his later publication, Lewis (1997, p. 32) maintained that "it is more efficient to learn the whole and break it into parts, than to learn the parts and have to learn the whole as an extra arbitrary item". Fluency, as viewed by this approach, rests heavily on the acquisition of chunks, which are fixed and semi-fixed word combinations (Debabi & Guerroud, 2018).

In light of the findings of this study, the researchers are in agreement with Zaabalawi and Gould's (2017) suggestion that reading texts should be regarded by teachers as a source of collocations. The teacher should attract learners' attention to collocations in context and help them keep a collocation notebook to record any collocation they come across.

Another pedagogical implication of this study entails incorporating explicit collocation instruction into EFL school textbooks and providing collocation activities such as multiple-choice and fill-in-the-blank questions. Even in speaking and writing activities, EFL teachers may provide suitable feedback to learners' miscollocations and then offer the right combinations.

Getting the most out of Quizlet, and other similar apps, to learn and improve language is also recommended since most learners own smart phones or tablets. Nevertheless, such utilization of technology should be rigorously monitored and closely supervised by teachers, and above all, should not go against the institutional policy.

In conclusion, this study is a third link in a chain, after Hsu's (2010) and Kasahara's (2011) studies, to explore the effect of direct collocation instruction on learners' word knowledge. However, the current study differed from the two previous ones in that it incorporated technology into collocation-based instruction and dealt with two dimensions of word knowledge.

Unlike the studies that used Quizlet to teach words and their meanings, this study made use of the flashcard app to teach collocations, not word meanings. It is the first study to utilize an electronic flashcard app to teach collocations, where the node is on one side of the flashcard and the collocate is on the other.

This study concluded that an electronic collocation-based instruction has a beneficial influence on improving word knowledge. Since the results are related to two sections in a secondary school in Jordan, more research is needed to further substantiate the positive role of e-learning and collocation instruction on language learning in general, and word knowledge in particular.

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