How to Cite:
Al-Malki, N. S. (2022). Integrating learning strategies for efl learners' vocabulary enrichment and retention: Applying KWS and MMS in Saudi classrooms. *Linguistics and Culture Review*, *6*(S2), 639-654. https://doi.org/10.21744/lingcure.v6nS2.2218

Integrating Learning Strategies for EFL Learners' Vocabulary Enrichment and Retention: Applying KWS and MMS in Saudi Classrooms

Norah Said Al-Malki
PhD Holder, Imam Mohammad bin Saud Islamic University, Saudi Arabia

***Abstract*---**This research investigates the impact of an integrated method based on Key-Word Strategy (KWS) and Mind-Mapping Strategy (MMS) on learning and retention of English vocabulary. The sample consisted of 80 Saudi female EFL students enrolled in the first grade of high school. The data were collected using pre-tests and post-tests and statistical analysis of the results compiled by employing a series of procedures, with all differences tested using statistical significance benchmark of 0.05. Results showed the outperformance of experimental group over the control group in the post-test. Similarly, the performance of the experimental group in the post test was much better than that in the pre-test. These results establish the positive impact of using the integrated method based on the MMS and the KWS for developing/ enriching and retaining vocabulary knowledge. The study recommends EFL teachers, learners and educational curriculum developers to integrate KWS and MMS in the Saudi context.

***Keywords*---**EFL female students, vocabulary, enrichment, retention, KWS, MMS.

Introduction

English has been taught as a foreign language albeit from early educational stages in Saudi Arabia. Though the recognition of English as an important language was beyond the contemporary times when it was first introduced, the change in learner and user needs in recent decades has been so drastic that proficiency in English has come to be seen as one's passport to individual and collective success. This has necessitated exploration of different aspects of the Saudi EFL scene to effectively identify the lacunae and find appropriate remedies. Prior to this realization, the system of education in Saudi Arabia was based on

***Corresponding author**: Al-Malki, N. S.; Email: norahalmalki2030@gmail.com*
Manuscript submitted: 27 June 2022, Manuscript revised: 09 August 2022, Accepted for publication: 18 Sept 2022

behaviourism theory (Alghamdi, 2013). For instance, high school students were usually taught in traditional ways, such as rote memorization and repetition. This way of teaching did not focus on developing learners' problem-solving or critical thinking skills. Based on previous experience, the teaching system in Saudi Arabia was aligned with a textbook-based approach in which instructors must follow a specific textbooks designed by curriculum designers. Thus, the teaching system was teacher-centred: the teacher was the only one who decided and controlled the whole learning process. Today, however, the modern vision of Saudi Arabia's educational system provides various opportunities and challenges for instructors and learners alike to improve their awareness. The important role of the student is now the focus of the learning process (Alghamdi, 2013). Instructors, consequently, have become more aware about learner engagement in the learning process and begun to give their learners some degree of responsibility. Learners have also become more autonomous, making more of their own learning decisions. Good instructors ask learners about their perceptions to know the best learning methods that suit their needs and knowledge levels (Brown, 2000; Kara, 2009; Oxford, 1990; Yassin et al., 2019). The more creative instructors implement new types of learning strategies in their classrooms that suit their learners' individual intelligences (Gardner, 2000). Others implement more than one strategy as an effective way to increase learner performance and participation. Thus, it can be stated that whatever the language teaching approach, academicians share the understanding that language proficiency is a factor of at least some degree of mastery in vocabulary. In this context, Wilkins (1972) rightly stated that 'without grammar little can be conveyed, but without vocabulary, nothing can be conveyed'. More recent studies (e.g., Chen, 2008; Mokhtar et al., 2017) have confirmed that vocabulary knowledge directly affects the development and growth of all the other language skills. Despite the abundance of research in learning vocabulary and strategies of teaching that have been conducted by language experts and researchers in the past decades, there is still no clear superior strategy in vocabulary learning. Because of this, researchers and experts have tried to provide learners with more effective strategies that increase their knowledge and facilitate their language acquisition.

The mnemonic method aims to improve EFL students' vocabulary retention (Baleghizadeh & Ashoori, 2010). In this method, learners develop a logical connection between vocabulary items with a picture in a way that accelerates its retention (Buzan, 2000). According to Baleghizadeh and Ashoori (2010), the logical connection in the keyword method is based mainly on two stages: first, finding acoustic similarity between an unfamiliar word and the learned word (keyword), and second, relating the two words with a certain picture to make connections between them. In the same vein, mind mapping is a student-centred vocabulary learning method that helps in vocabulary learning, memorization, summarization, revision, and retention (Buzan, 2000). It emphasizes the learner's ability to use the language appropriately by making a connection between vocabulary items.

Mind mapping is a technique or graphic-tool that presents relationships and associations between ideas by using colours, images, shapes, symbols, lines, and pictures. Mind mapping is defined by Brown (2000) as a visual, logical operation

for planning, organizing, clarifying, manipulating, and controlling certain information. Mind mapping was developed by Buzan (2000) to facilitate learning and memorization by organizing traits and ideas. The researcher defines mind mapping as a visual image or graphic that presents ideas and concepts in a way that is simple to remember in order to help learners to recall, analyse, and memorize concepts easily.

Mind mapping and the keyword method are considered as learning and teaching strategies that prove effective in the systematic acquisition of vocabulary by EFL learners (Brazley, 2008; Bukhari, 2016). These two strategies are also used to help EFL teachers present, clarify, and explain new vocabulary and make the learning process more enjoyable so that students stay motivated to learn. They are also thought to be effective in overcoming the recall problem among EFL/ESL learners in terms of vocabulary uptake, making the learning process more effective (Baleghizadeh & Ashoori, 2010; Bin-Hady, 2021; Gaul, 2004; Richmond et al., 2008). In addition to these gains, these strategies increase learner autonomy as established by previous studies. As such, success in vocabulary learning is essential for high school English learners, especially nowadays, when the aim of language learning has come to rest on communication.

Literature review

Early research in language learning recognized the significance of vocabulary in language acquisition. Schmitt (2010) stated, 'learners carry around dictionaries and not grammar books'. Vocabulary acquisition is very critical not only for mastering a language for educational purposes, but also for increasing the learners' communication ability in various contexts. Therefore, it is necessary for language learners to focus vocabulary learning because it entails the mastering of other language skills. Additionally, vocabulary learning is fundamental for successful foreign language proficiency (Lin, 2008). At the same time, EFL learners who do not have the necessary number of lexical items in a foreign language classroom may face language difficulties such as comprehension problems and communicative difficulties (Pittman, 2008). Sorbi (2010) stressed that insufficient knowledge of vocabulary is one of the challenges faced by learners of a second or foreign language, which leads to language learning difficulty. Furthermore, Bromley (2002) discussed the important role of vocabulary learning and its effectiveness in the language learning context. Vocabulary learning improves learner achievement, enhances learner communication with peers, and enhances learners' ability to learn, memorize, analyse, connect, and evaluate.

Many authors have argued that mnemonic devices are expected to produce positive, long-term memory results (Mastropieri & Scruggs, 1990). Several studies have revealed that mnemonics need not be used only for vocabulary learning (Hauptmann, 2004; Sariçoban & Basibek, 2012) but also for many subjects and skills such as writing (Richards & Renandya, 2002), reading (Benge & Robbins, 2009), learning in science subjects (Pal, 2014), and also with gifted learners (Mastropieri, Scruggs, & Fulk, 1990). The mnemonic strategy can also be used with learners of different ages, from children (Pal, 2014) to adults (Mastropieri, Emerick, & Scruggs, 1988; Brown & Perry, 1991). It can also be used to promote

academic performance (Mastropieri & Fulk, 1990). Mnemonic devices can be defined as devices that integrate visual imagery and words to relate the new unfamiliar word with previously familiar words. It is based on a two-step process of an acoustic link (that is, the word sound) and an image link. One of the popular mnemonic techniques is known as the keyword strategy (KWS).

Paivio (1971) also mentioned that the KWS is an effective learning tool that includes the use of visual and verbal processes. Visual processes are represented in the design of images that associated the definition of keyword to the word to be learned, and verbal processes involve the keyword definition. The use of the KWS seems to be promising in classroom instruction, as learning vocabulary with the KWS makes the learning process more interesting and relevant to learners who have an active role in their learning. Carney et al. (1993) reported that the usage of the KWS in psychology courses created a deeper understanding, increased retention, and increased leaner autonomy. Carney et al. (1993) reported the success of the KWS based on the design of interactive images that connect keywords and the definitions of words. Language learners can use their own native language, personal experiences, ideas, and cultures to form their KWS to make use of them (McCarville, 1993).

Mind mapping strategies, on the other hand, are known by different names, such as, spider diagramming, visual flow charting, and concept mapping. MMS was defined by Buzan (2000) as a way of organizing information logically to make an image in the brain that leads to information recognition. Buzan (2000) described MMS as a visual graphic that illustrates how a single concept relates to another concept in the same category. MMS presents the association between many ideas, concepts, images, and topics at the same time. It is particularly helpful for students who consider traditional methods assessments frustrating because assessments are mainly based on language levels (Schmitt, 2000).

MMS consists of a combination of terms, shapes, colours, images, concepts, and visual association data, which improve recall compared to traditional learning methods. In fact, MMS helps students organize information in certain ways, which in turn assists them in memorizing and recalling such information easily and quickly (Al-Ahdal & Alharbi, 2021; Al-Ahdal & Al-Ma'amari, 2015; Buzan & Buzan, 1994). Farrand (2002) posited that using MMS in the learning process improves students' long-term memory. Byrnes (2010) found that using the MMS as a learning tool can increase learners' recalling by up to 95%. These findings provide evidence that the use of the MMS method helps learners think deeply and clearly in exploring the relationships and associations between elements and ideas and finding solutions to their learning difficulties. The use of various colours, shapes, images, and symbols can help increase learners' attention because it makes the learning process easier, more effective, more real, and it also motivates students more (Buzan, 2000).

KWS and MMS studies in the Saudi context

There have been notable studies on the application of KSW in the Saudi EFL. The effect of the mnemonic KWS on Saudi university students' attitudes toward the mnemonic KWS and strategies used in learning vocabulary. The sample consisted

of 40 university learners studying at Taibah University. Results indicated that the positive attitude of Saudi students toward using the mnemonic KWS and the implementation of the KWS has positive effects if compared with traditional ways of teaching vocabulary. The study also presented a significant improvement in learners' vocabulary learning and retention due to the use of the KWS. Yet, despite the positive implementation of keyword-based strategy in teaching vocabulary (Othman et al., 2019).

Al Khawaldeh and Al-Khasawneh (2019) investigated the effect of mnemonic KWS on vocabulary learning and teaching among disabled students in Saudi Arabia. The study was experimental in nature; thus, the researchers conducted pre-tests and post-tests to compare performance before and after the experiment. The experimental group outperformed the control group in the delayed test. Therefore, the result findings give evidence that the mnemonic KWS for learning vocabulary is a successful strategy.

Alzahrani (2011) explored the effectiveness of the KWS in vocabulary learning and precision for intermediate students with different memory working capacities. The results revealed that the KWS positively affects learners' vocabulary achievement and retention, and that high working memory capacities were better in achievement and retention than low working memory capacities. This study provides sufficient data and presents a valuable review of the literature on the mnemonic KWS, as well as data about the use of the KWS and its effect in vocabulary learning and retention. The study also provides clear explanations and critical analysis about the role of KWS in vocabulary learning in the classroom.

A study conducted by Abdulrazak (2008) studied the efficacy of keywords in the learning of Arabic vocabulary on Malaysian secondary school pupils. The researcher selected 110 Arabic words for the experiments. Based on the study results, the learners it was seen that the students who used KWS outperformed the students who used the traditional memorization strategy, which was considered helpful in acquiring Arabic words, in the delayed test. This study discussed in detail the use of the KWS in vocabulary learning. It presented significant data gathered about the use of keywords strategy for vocabulary learning, and the sample size was suitable for generalizing the study results among Arab learners. Abdulrazak's study differs from the current study since this study concentrates on English vocabulary learning.

Shaman's (2015) study presented a good model for the use of the KWS that may be useful to better understand how language learners apply KWS vocabulary learning to improve vocabulary achievement and retention. Shaman critically reviewed the literature and provided sufficient data about the history of the KWS and its effect in language learning. The experimental group achieved better than the control group in vocabulary retention. Positive effects were also seen on students' participation and creativity.

Similar to the aforementioned, there are several studies on the use of MMS in different facets of language learning in the Saudi context. Alzahrani (2011) conducted a study with forty EFL students to examine the effectiveness of using the MMS in learning grammar (specifically, the future tense) to third-year

students in secondary school. Results of post-test indicated significant differences ($\alpha < 0.05$) between groups in favour of the experimental group. The findings suggested that the use of the MMS to generate, visualize, and organize grammar rules is more beneficial than relying on traditional learning methods.

Bukhari (2016) studied the impact of MMS on EFL writing skills. The study used a survey to elicit the participants' opinions toward using the MMS technique and its effect on their writing skills. Results showed a significant difference between the mean score of the pre-test and the post-test, revealing that using the MMS technique in the pre-writing process improved the students' writing achievement.
Daghistan (2016) experimentally probed the impact of MMS on modifying the lack of attention in Saudi kindergarten children. Findings revealed a positive change in the experimental group's concentration and attention. Using MMS is recommended to avoid attention deficiency among kindergarten children in Saudi Arabia.

Al-Ahmadi (2019) examined the effectiveness of MMS on Saudi students at Taibah University. The sample comprised 50 students studying English and the study was experimental in nature. The results showed that the use of the MMS facilitated vocabulary learning and increased learners' motivation to learn new vocabulary items. This study provided sufficient data about the experiment though based on only one instrument, the results of pre-test and post-test.

Research question

Over the last 20 years, there has been a great shift in emphasis in the field of language learning, from teachers and teaching to learners and learning. Researchers have argued that it is more effective to use different vocabulary learning strategies than using traditional teaching in increasing word retention, word meaning, and word analysis. However, notwithstanding the various number of studies that targeted language learning strategies (LLS) and vocabulary learning strategies (VLS) within the EFL settings, few studies explored the integrated use of LLS and VLS in the Saudi EFL context, leaving a perceptible gap in the available literature, which this study explores by evaluating the impact of using a novel integrated strategy on Saudi female first-year high school students' vocabulary learning, retention by seeking to answer this query:
How effective is a strategy that integrates the mnemonic keyword method and mind mapping in enhancing vocabulary learning and retention among Saudi EFL learners?

Hypothesis

Students in the experimental group scored higher than their peers in control groups in the post-test due to the KWS and MMS intervention.

Method

A pre-post-test design with two groups was adopted in this study conducted at schools in Riyadh. The Vocabulary Level Test (VLT) was administered via Google Forms to first high-grade school learners as a pre-test to analyse the students'

vocabulary scores before the intervention (either the proposed integrated strategy or the traditional method).

Nation (1983) originally designed the VLT in an attempt to provide a professional guide for teachers to find out their ESL/EFL learners' weaknesses. To measure the test reliability, the researcher used Cronbach's alpha, which is a measure of internal consistency that reveals how closely related a set of items are as a group, depicted in Table 1.

Table 1: Reliability Statistics

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.905	.972	3

As shown in the table above, Cronbach's alpha reached 0.905, which indicates a relatively high internal consistency. Thus, the test is reliable, as the alpha scores for all tests and total items are considered acceptable.

Participants

The study sample consisted of 80 female Saudi high school students (first grade) in Riyadh. All students were registered for the 2020 academic year, and they were all female Saudi students enrolled across 156 high schools in Riyadh. The student`s' ages ranged from 17 to 19 years old. The students' native language is Arabic; they started learning English as a target language from the fourth grade of primary school for 6 years. The high school students were receiving the same teaching materials, prescribed by the Ministry of Education. Few learners had heard about mind mapping or the keyword strategy, or about mnemonics in general. The researcher decided to choose a first-grade high school due to their sufficient repertoire of English vocabulary that enables them to deal with mind mapping and keyword strategies. The sample was divided into experimental and control groups before the treatment. As for the homogeneity of the groups, the Pearson English placement test was administered to the two groups to determine their proficiency levels; the results of the test showed that they are homogenous, as depicted in Table 2.

Table 2: Participants' Homogeneity

Level of education	Number of students	Age of the students	Years of studying English
High school (first grade)	80	17–19 years	6 years

The test was designed as 120 items organized in multiple-choice questions. The test took participants 45 to 60 minutes to complete, and it was conducted at the same time for all students before and after the intervention.

Procedure and treatment of data

The researcher excluded the vocabulary items that were known to the learners (30 out of 150 words) and included the unknown vocabulary items (120 words). The learners were asked to start creating a mind map. First, they drew an image in the centre of the of paper to represent the fundamental topic. For emphasis, the learners had to use distinctive colours and images. Then, they produced a series of thick lines radiating out from the centre of the image. Finally, they produced a keyword on each branch to associate with the topic.

The proposed strategy, which was based on the keyword strategy and mind mapping, involved five main stages. In the first stage, the teacher concentrated on word pronunciation – how learners can pronounce the words correctly and use them frequently in their speech using drill activities, examples, and audios. In the second stage, the teacher asked students to select a keyword – a familiar word that sounded similar to the new word based on word roots and homophones. Learners connected that word with a visual image to be recalled in the later stages. In the third stage, the teacher asked learners to draw a mind map connecting the newly learned words and their similar-sounding keywords to a relevant central topic. In the fourth stage, the teacher asked learners to expand the branches with sub-branches; each branch is connected to its sub-branches as headings. The branches may have many functions, generating a linear hierarchy to identify and classify different types of words, or use word roots and homophones to connect the new word with a similar word used with the central topic as well as short phrases to clarify the word meaning. In the fifth stage, the teacher asked the learners to use many colours and images for the topics and subtopics and to share their final work with other groups to try to exchange some new words that they could add to their map. The teacher provided some of the keywords and asked them to provide other keywords to ensure their participation and authenticity.

In each lecture, the teacher negotiated the new words and asked learners to work in groups to make them think about, create, connect, and produce new keywords. For the control group, the regular classroom vocabulary teaching and learning strategy was followed. This strategy also involves many steps. First, the teacher repeats the new English words and provides the learners with their equivalent in Arabic. Then, they write the new words in lists to be memorized. The teacher asks learners to loudly read the words to correct the learners' pronunciation. Many repetitions and drills are carried out to memorize these new items. The teacher translates the new vocabulary items and asks learners to produce short sentences using these. In each class, the teacher repeats the same steps with a new group of words. The teacher asks learners to organize the new vocabulary items and their meanings in lists to be revised and memorized.

The treatments were tried out on the students for eight consecutive weeks after which the two groups received the same version of the Nation VLT at the same time. A paired samples t-test (two dependent samples) was used to measure the differences between scores of the students in control and experimental group in the pre- and post-tests.

A one-way ANOVA was used to compare the two groups' performance to decide whether or not the integrated method is more beneficial than the traditional method for vocabulary learning. This study also uses a two-way ANOVA to measure the effect of the integrated method on the two groups. A t-test was performed to check the difference of performance between the experimental group (trained on the proposed strategy) to the control group (taught by the traditional method) in the pre-test and the post-test.

Results

The research question was: How effective is a strategy that integrates the mnemonic keyword method and mind mapping in enhancing vocabulary learning and retention among Saudi EFL learners?
This question examines the effect of an integrated method based on the MMS and the KWS on developing EFL learners' vocabulary learning and retention. To answer this question, the researcher used two tests (pre-test and post-test). The scores of the experimental group and the control group were compared. Table 3 shows that the experimental group achieved (M=20.3, Std= 3.94319 while the control group scored (M=19.55, Std= 3.52973). It shows there are no moral difference between the groups in the pre-test in the Nation vocabulary knowledge test. The t-test values (2-tailed) were 0.896, which indicates that the two groups were equivalent in their vocabulary knowledge. This proved that the two groups were approximately at the same level of performance in vocabulary knowledge at the beginning of the experiment.

Table 3. Students' overall vocabulary knowledge in the pre and post tests

	Group	N	Mean	Std.	Std. error mean	T	Def	Sig
Pre-test scores	Experimental	40	20.3000	3.94319	.62347	0.896	78	0.373
	Control	40	19.5500	3.52973	.55810			

Table 4 indicates a significant difference between the means of both groups in favour of the experimental group (83.9500). Table 4 also shows that the significant value is 0.000. A two-way ANOVA was conducted to examine the effect of interactive teaching methods on the scores. The findings summarized in Table 4 below confirms the hypothesis which assumes that the experimental group scored higher than the control group in the post-test as a result of their exposure to KWS and MMS intervention in the absence of any other stimulus.

Table 4: Students' overall vocabulary knowledge scores in the post-test

	Group	N	Mean	Std. deviation	Std. error mean	T	Df	sig
Post-test score	Experimental	40	83.9500	11.25679	1.77986	20.539	78	0.000
	group	40	41.5500	6.61370	1.04572			

Table 5 show that there was statistically significant interaction between the teaching methods and vocabulary post-test score level, with F = 1064.329

and p = 0.000 with 93.3%. It can be concluded that this proves the effectiveness of using of the integrated method in developing student's vocabulary learning.

Table 5: Two-way Anova results of the integrated method on vocabulary post-test

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial squared
Corrected model	40204.829[a]	2	20102.415	645.444	.000	.944
Intercept	1462.552	1	1462.552	46.959	.000	.379
Prescore	4249.629	1	4249.629	136.446	.000	.639
Group	33148.611	1	33148.611	1064.329	.000	.933
Error	2398.171	77	31.145			
Total	357608.000	80				
Corrected total	42603.000	79				

a. R Squared = .944 (Adjusted R Squared = .942)

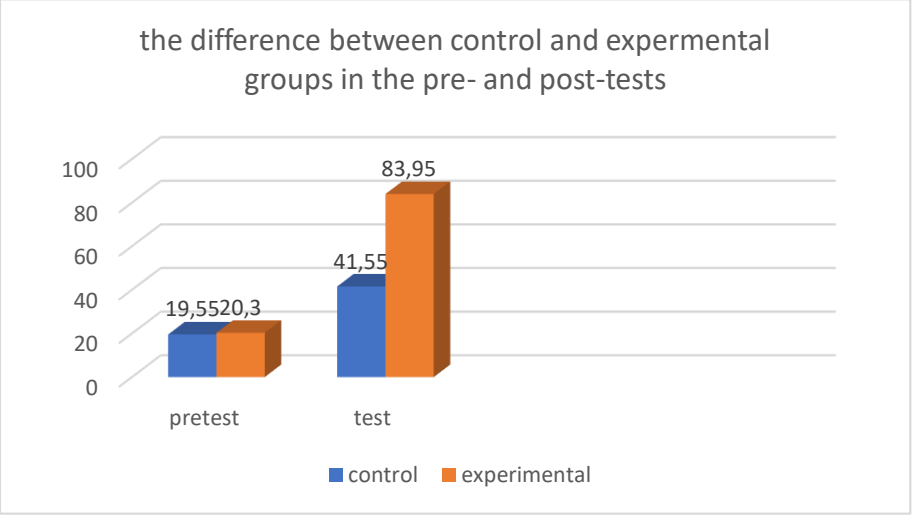

Figure 1: Difference between Control and Experimental Groups in the Pre-test and Post-test

At the same time, the group mean of the experimental group shows significant improvement in the vocabulary enrichment and retention as summarized in Table 6 below.

Table 6: Group mean of the experimental group

		Mean	N	Std. deviation	Std. error mean	correlation	T	df	Sig
Pair 1	Scores of experimental group pre-test	20.30	40	3.943	.623	0.906	-51.198	39	0.000
	Scores of experimental group post-test	83.95	40	11.25679	1.77986				

Data in the paired sample statistics above are depicted in Figure 2 below.

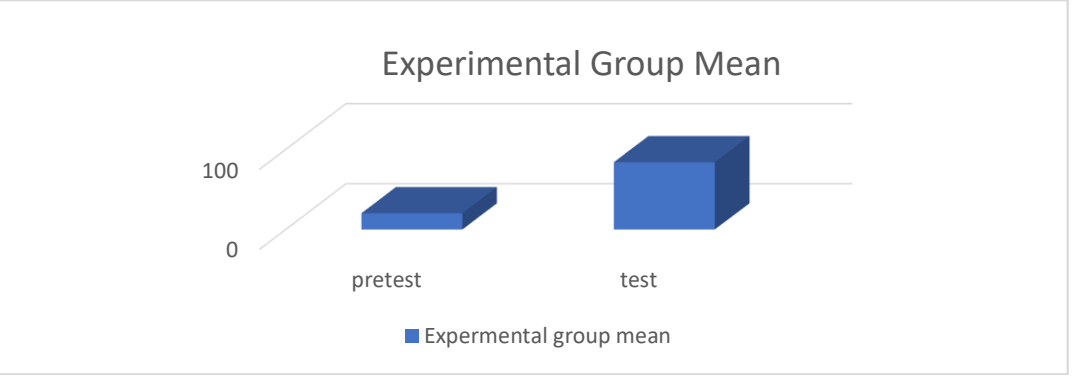

Figure 2: Experimental Group Mean in Pre and Post-tests

Discussion

The findings are in agreement with various studies which compared vocabulary learning strategies such as the translation method (Avila & Sadoski, 1996) and other mnemonic techniques (Richmond et al., 2008), with the keyword strategy. The integration of KWS and MMS led the experimental group to outperform the control group in the post-test. Other studies in this league are Hauptmann (2004), Hogben (1996), Karimi and Heidari (2015), O'Malley et al. (1985), and Shapiro and Water (2005). Karimi and Heidari (2015) also revealed that there was a difference between the performances of both groups in the post-test. It also showed that the VLL directly and effectively helped the students acquire and retain vocabulary.

Moreover, Hauptmann's (2004) findings showed that the keyword method improved vocabulary retention more than other strategies and had a positive effect on learners' motivation. The findings also agree with O'Malley et al. (1985), who found that participants in the experimental group were keen to use the integrated strategy in future learning. The students in this study said that the integrated approach had a positive effect on their learning, retention, and acquisition in general. These results are also in line with a study conducted by Baleghizadeh and Ashori (2010), which showed that KWS had a dominant impact on learners' memory in recalling word definitions.

In addition, the results of the present study illustrate the favourable effect of KWS on the learners' retention of lexical items that were taught in the course and

contributed to higher retention and achievement levels in the experimental group compared to the controlled group. These differences could be ascribed to various reasons. The first reason is the incorporation of visuals. According to Shapiro and Water (2005), the keyword method offers visual stimuli that result in better retention than other kinds of stimulus because it provides interactive similes. The second reason is that as a mnemonic technique, KWS involves linking new information and previous knowledge and background schema. According to Lawson and Hogben (1996), the success of the keyword method in vocabulary acquisition is dependent on creating connections between new and old information.

Conclusions

The findings assert the effectiveness of the integrated method on Saudi high school students' vocabulary enrichment/ learning and retention. The mnemonic keyword method contributed to enhancing learners' vocabulary retention, which was evident in the data gathered in the post-test for both the experimental and control groups. Specifically, in the post-tests, the performance of the experimental group was more distinguished than that of the control group, even though the pre-test results for both groups did not show any significant difference between them. This means that, before the intervention, they had similar proficiency levels. The findings show a significant difference between the keyword-taught group and the traditionally taught group, which can be attributed to the strategy and the way of using it. The fact that MMS and KWS can be used in different ways and in different stages of the lesson makes a huge difference. There is a wide variety of exercises that can use these strategies.

Furthermore, the fact that there are differences between the performance of the experimental and control groups is due to the nature of the strategies. The experimental group learned vocabulary through a method that focused on keeping the learning process enjoyable and colourful. Mind maps help students connect colours, symbols, and pictures with words, which provokes both hemispheres of the brain to work and thus results in high retention of the words. This will eventually lead to improving learners' achievement levels. Participants were so keen to learn new methods of learning vocabulary to help them alleviate the boredom of the traditional method. This would be easier with an integrated method, which would come close to the students' ages and thinking levels. Consequently, this would result in a motivated learner group that is ready to learn more.

Recommendations

As keyword method boosts learners' vocabulary learning, teachers should motivate students and incorporate this method and other VLS to cater to learners' autonomy and self-learning in the educational system. From an educational perspective, it is important that educators apply vocabulary training techniques to enhance acquisition and provide better and deeper learning opportunities for the comprehension of materials and ideas.

Limitations of the study

This study is limited to only female first-year high school students which may prevent the generalization of findings to other levels. Furthermore, the study focuses only on the English vocabulary and excludes others English language skill areas. However, these limitations were compulsions with the researcher given the limited scope of the present study.

References

Abdul-Razak, M. (2008). *The effectiveness of keyword method in acquisition of Arabic vocabulary among students of national secondary schools in Malaysia* (Unpublished MA thesis), Islamic University, Malaysia.

Al-Ahdal, A. A. M. H., & Alharbi, M. A. (2021). MALL in collaborative learning as a vocabulary-enhancing tool for EFL learners: A study across two Universities in Saudi Arabia. *Sage Open*, *11*(1), 2158244021999062.

Al-Ahdal, A. A. M. H., & Al-Ma'amari, A. A. H. (2015). Learning Strategies of the Arab EFL Learners: Finding Correlation with Outcomes. *Advances in Language and Literary Studies*, *6*(5), 230-241.

Alghamdi, A. (2013). Pedagogical implications of using discussion board to improve student learning in higher education. *Higher Education Studies*, *3*(5), 68–80.

Al-Khawaldeh, M., & Al-Khasawneh, F. (2019). The effect of mnemonic keyword strategy instruction on vocabulary retention of students with learning disabilities. *International Journal of English Linguistics*, *9*(4), 138-144.

Al-Zahrani, M. (2011). *The effectiveness of keyword-based instruction in enhancing English vocabulary achievement and retention of intermediate stage pupils with different working memory capacities* (Unpublished master's thesis), Taif University, Saudi Arabia.

Al-Zahrani, M. A. B. (2011). *The effectiveness of keyword-based instruction in enhancing English vocabulary achievement and retention of intermediate stage pupils with different working memory capacities.* Taif University

Avila, E., & Sadoski, M. (1996). Exploring new applications of the keyword method to acquire English vocabulary. *Language learning*, *46*(3), 379-395.

Baleghizadeh, S., & Ashoori, A. (2010). The effect of keyword and word list methods on immediate vocabulary retention of EFL learners. *Pakistan Journal of Social Sciences*, *30*(2), 251–261.

Benge, C., & Robbins, M. E. (2009). Using keyword mnemonics to develop secondary students' vocabularies: A teacher's action research. *Journal of Language and Literacy Education*, *6*(1), 93–104.

Bin-Hady, W. R. A. (2021). The role of games in enhancing EFL students' vocabulary acquisition. *Faculty of Education Scientific Journal*, *17*(1), 59-68.

Brazley, M. (2008). *The effects of mnemonic keyword and rote methods of vocabulary instruction on the immediate and delayed word recall and application by high school students with learning disabilities,* (Unpublished master's thesis). University of Memphis.

Bromley, K. (2007). Nine things every teacher should know about words and vocabulary instruction. Journal of adolescent & adult literacy, 50(7), 528-537.

Brown, D. (2000). *Principles of language learning and teaching*. London: Longman.

Brown, T., & Perry, F. (1991). A comparison of three learning strategies for ESL vocabulary acquisition. *TESOL Quarterly*, *25*(4), 655–670.

Bukhari, S. (2016). Mind mapping techniques to enhance EFL writing skill. *International Journal of Linguistics and Communication*, *4*(1), 58–77.

Buzan, T. (2000). *The mind map book*. New York, NY: Penguin Books.

Buzan, T., & Buzan, B. (1994). *The mind map book: How to use radiant thinking to maximize your brain's untapped potential*. New York, NY: Dutton.

Byrnes, C. (2010). Mind mapping. *PMI Global Congress*. Project Management Institute. Retrieved August 8, 2017, from https://www.pmi.org/learning/library/mind-mapping-advantage-think-creatively6554

Carney, R., Levin, M., & Levin, J. (1993). Mnemonic strategies: Instructional techniques worth remembering. *Teaching Exceptional Children*, *25*, 25–30.

Chapelle, C. (1999). From reading theory to testing practice. In M. Chalhoub-Deville (Ed.), *Issues in computer-adaptive testing of reading proficiency* (pp. 150–166). University of Cambridge Local Examinations Syndicate and Cambridge University Press.

Chen, P. (2008). *The effects of utilizing different types of printed dictionaries on vocabulary acquisition, retention, and reading comprehension,* (Unpublished PhD thesis). La Sierra University.

Daghistan, B. (2016). Mind maps to modify lack of attention among Saudi kindergarten children. *International Education Studies, 9(4), 245-256.*

Gardner, H. (2000). *Intelligence reframed: Multiple intelligences for the 21st century*. New York, NY: Basic Books.

Gaul, A. (2004). *Do sixth-grade students have greater immediate recall of vocabulary definitions if they select their own terms while employing the mnemonic KWS method?* (Unpublished PhD thesis). Widener University.

Hauptmann, J. (2004). *The effect of the integrated keyword method on vocabulary retention and motivation*, (Unpublished PhD thesis). University of Leicester.

Kara, A. (2009). The effect of learning theories unit on students' attitudes towards learning. *Australian Journal of Teacher Education*, *34*(3), 100–113.

Karimi, N., & Heidari, M. (2015). Knowledge and attitudes toward epilepsy among school teachers in West of Iran. *Iranian Journal of Neurology*, *14*(3), 130–5.

Lawson, M. J., & Hogben, D. (1996). The vocabulary-learning strategies of foreign-language students. *Language Learning*, 46(1), 101–135.

Lin, C. (2008). *Learning German vocabulary: An investigation into learners' use of vocabulary learning strategies*, (Unpublished PhD thesis). University of Waterloo.

Mastropieri, M., & Scruggs, T. (1998). Enhancing school success with mnemonic strategies. *Intervention in School and Clinic*, *33*(4), 201–208.

Mastropieri, M., Scruggs, T., & Emerick, K. (1988). Mnemonic instruction in science concepts. *Behavioral Disorders*, *14*(1), 48–56.

Mastropieri, M., Scruggs, T., & Fulk, B. (1990). Teaching abstract vocabulary with the keyword method: Effects on recall and comprehension. *Journal of Learning Disabilities*, *23*(2), 92–96.

McCarville, K. (1993). Keyword mnemonic and vocabulary acquisition for developmental college students. *Journal of Developmental Education*, *16*(3), 2–5.

Messick, S. (1989). Meaning and values in test validation: The science and ethics of assessment. *Educational researcher*, *18*(2), 5-11.

Messick, S. (1995). Standards of validity and the validity of standards in performance asessment. *Educational measurement: Issues and practice*, *14*(4), 5-8.

Mokhtar, A., Rawian, R., Yahaya, M., Abdullah, A., & Mohamed, A. (2017). Vocabulary learning strategies of adult ESL learners. *The English Teacher*, *38*(12), 133–14.

Nation, I. (1983). Testing and teaching vocabulary. *Guidelines*, *5*(1), 12–25.

Nation, I. (1990). *Teaching and learning vocabulary*. Heinle & Heinle Publishers.

Nation, I. (2001). *Learning vocabulary in another language*. Cambridge University Press.

Nation, P. (2003). The role of first language in foreign language learning. *Asian EFL Journal*, 5(2), 1-8

O'Malley, J., Chamot, A., Stewner-Manzanares, G., Küpper, L., & Russo, R. (1985). Learning strategies used by beginning and intermediate ESL students. *Language Learning Journal*, *1985*(35), 21–46.

Othman, W., Mohammed, O., & Kayode, B. (2019). Investigating the impact of mnemonic-based instruction on Saudi University students attitudes towards vocabulary learning. *International Journal of English Language Education*, *7*(2), 13–10.

Oxford, R. (1990). *Language learning strategies: What every teacher should know*. New York, NY: Newbury House.

Paivio, A. (1971). *Imagery and verbal processes*. NY: Holt, Rinehart and Winston.

Pal, S. (2014). Teaching language through mnemonics programme in pre-school children with hearing impairment. *American International Journal of Research in Humanities, Arts, and Social Sciences*, 196–199.

Pittman, D. (2008). *A comparison of explicit and implicit vocabulary instruction on the acquisition of English vocabulary and reading comprehension in English language learners in grades four through twelve,* (Unpublished PhD thesis). University of Mississippi.

Read, J. (2000). *Assessing vocabulary*. Cambridge: Cambridge University Press.

Read, J., & Chapelle, C. (2001). A framework for second language vocabulary assessment. *Language Testing*, *18*(1), 3–32. http://doi.org/10.1191/026553201666879851

Richards, J. C., & Renandya, W. A. (2002). *Methodology in language teaching: An anthology of current practice* (1st ed.). Cambridge University Press.

Richards, J., & Rodgers, T. S. (1995). *Approaches and methods in language teaching*. Cambridge University Press.

Richmond, A. S., Cummings, R., & Klapp, M. (2008). Transfer of the method of loci, pegword, and keyword mnemonics in the eighth grade classroom. *Researcher*, *21*(2), 1–13.

Sariçoban, A., & Basibek, N. (2012). Mnemonics technique versus context method in teaching vocabulary at upper intermediate level. *Egitim ve Bilim*, *37*(164), 251.

Schmitt, N. (2000). *Vocabulary in language teaching*. Cambridge University Press.

Schmitt, N. (2010). Researching vocabulary: A vocabulary research manual. Palgrave Macmillan.

Shaman, S. (2015). *Using the expanded keyword method to help K-12 students develop vocabulary knowledge*. Ann Arbor, WA: Washington State University. 3717472: 90.

Shapiro, A., & Waters, D. (2005). An investigation of the cognitive processes underlying the keyword method of foreign vocabulary learning. *Language Teaching Research*, *9*(2), 129–146.

Sorbi, A. (2010). The relationship among word knowledge, word prediction and reading. *International Journal of Language Studies*, *4*(1), 1–28.

Wilkins, D. (1972). *Linguistics in language teaching*. London: Edward Arnold.

Yassin, A. A., Razak, N. A., & Maasum, T. N. R. T. M. (2019). Integrated model for teaching language skills. *International Journal of English Linguistics*, *9*(5).