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Effects of Working Memory Strategies on Learning Lexical Collocations: The Arab Context

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ABSTRACT

This study examines the effects of working memory strategies (WMS) on EFL Arab students learning lexical collocations. The objectives of the study are to identify the most frequent and effective WMS and to investigate how different WMS impact the learning of various lexical collocations. Eight participants took part in this study, and they were divided into two experimental groups: an L2-only English group and a code-switching group. Stimulated Recall Interviews (SRI) were used as the main methodology to investigate the participants' use of WMS. These interviews were conducted to determine the extent to which learners use WMS and, consequently, how these strategies influence their speaking abilities. The assessment process involved administering three separate speaking tests. The finding shows that repetition and imagery strategies are the most commonly used strategies and are considered to be most effective in learning collocations. Furthermore, the study demonstrates that certain types of collocations, such as adjective-noun pairings, are more accessible than others, such as those containing adverbs, in the participants' speaking performance. The implication underscores the necessity of incorporating WMS into language learning, particularly in the context of improving speaking skills. Furthermore, the study underlines the importance of mastering lexical collocations to achieve proficiency levels comparable to native speakers. This study aims to raise awareness about the practical application of WMS and the importance of collocations in language learning.

Keywords: Arab learners; EFL; codeswitching; Lexical collocations; Working memory strategies

INTRODUCTION

Lexical collocations are groups of words that consistently co-occur in sentences based on usage patterns. They play an important role in fostering clear communication by improving the ease with which thoughts may be communicated both verbally and in writing. Thus, understanding and using collocations effectively contributes to improving learners' English language communication skills. Arab EFL learners frequently face challenges when attempting to learn English lexical collocations. This is because English has a large vocabulary, and learners may struggle to master collocations due to insufficient exposure and practice in the target language (Alsakran & Ehlers-Zavala, 2011; Afzal, 2019; Nadeem & Almowalad, 2022). Another challenge that EFL Arab learners may face is the idiomatic usage of lexical colocations, as collocations frequently include common expressions that do not have direct equivalents in the learner's original language. This might lead to misunderstanding or inappropriate language use (Bui, 2021). Furthermore, for the reason that English syntax and grammar are intimately related to collocations, choosing the incorrect collocation can cause sentences to seem awkward or unclear (Tan et al., 2024).

Collocations can also reflect cultural nuances and references, making it difficult for EFL learners to fully understand their meaning and usage. This presents an additional challenge for EFL Arab learners (Suliman, 2019). Therefore, it is crucial to improve speaking skills among EFL Arab learners through efficient vocabulary learning strategies to learn collocations for several reasons, which are:

1. Collocations enable learners to talk more naturally and confidently, which helps with fluency. Correct collocation usage helps learners' speech sound more natural.
2. Proper collocation use makes EFL learners' speech more understandable and helps them make their intended meaning plainer to native speakers.
3. Collocations are a useful tool for EFL learners who want to better understand cultural subtleties and use language that is acceptable for the given circumstance.
4. Collocation mastery is frequently linked to advanced language competence.

(Bui, 2021; Arifani et al., 2020; El-Dakhs, 2023; Qader, 2018)

Hence, developing collocational skills can be used to measure an English learner's advancement. (Bahns, (1993). Addressing the specific difficulties faced by EFL Arab learners and applying effective collocation learning strategies will help learners improve their speaking and communication skills in English. According to Hadia Hakem Benkhenafou (2015), EFL Arab learners can enhance their speaking abilities by adopting vocabulary strategies such as contextual learning, practising collocations regularly, and using technology-assisted tools that focus on collocation usage. In addition, El-Dakhs (2023) emphasised that effective instructional methods significantly influence collocation acquisition among Arab EFL learners, further supporting the relevance of deep processing theory in vocabulary learning.

PROBLEM STATEMENT

The challenges faced by EFL Arab learners in acquiring English collocations are rooted in several factors related to language structure, educational practices, and cross-linguistic interference. First, the differences in linguistic structure between Arabic and English create difficulties for learners when adapting to English collocational patterns, as Arabic's distinct word order and sentence structure pose unique challenges (Siddig, 2022). Second, the limited interaction with native speakers reduces opportunities for EFL Arab students to gain exposure to natural collocations, making it harder to learn these patterns through immersion (Faqe & Abbas, 2022; Sonbul & El-Dakhs, 2020). Third, direct translation from Arabic to English often results in improper collocations due to the variation in idiomatic expressions between the two languages (Al-Jarf, 2022). Additionally, traditional educational approaches may overlook collocations, as grammar and vocabulary are frequently emphasised separately, diminishing the significance of collocation learning (R. Alshammari et al., 2021). Lastly, the impact of the first language on English lexical collocations can be observed through L1 transfer and interference patterns. EFL Arab learners may incorporate Arabic collocational patterns into their English, leading to awkward usage (Öksüz et al., 2021). The cultural context also plays a crucial role, as collocations are often tied to a language's cultural background, which can make it difficult for learners to comprehend and correctly use English collocations (Habtoor & Al-Swaidan, 2019; Wu et al., 2024).

Therefore, this study seeks to explore the particular challenges Arab EFL learners face in learning English collocations by considering how linguistic, educational, and cultural factors shape their learning process. By analysing structural language differences, limited English exposure, and cross-linguistic influences on collocation use, this research aims to support learners in using English collocations more accurately. Through a detailed examination of these challenges, the study proposes practical approaches to strengthening learners' collocational skills, helping them communicate more clearly and effectively in English.

VOCABULARY LEARNING STRATEGIES AND WORKING MEMORY STRATEGIES

Various taxonomies covering vocabulary learning strategies have emerged in the field of language learning. Notably, significant contributions by Gu and Johnson (1996), Nation (2001), and Schmitt and McCarthy (1997) defined varied strategies suited to meet learners' characteristics, including learning styles, age, gender, motivation, attitude, and personality, among others. Schmitt developed the taxonomy under consideration in this study, which is based on Oxford's (1990) taxonomy of language learning strategies. Several studies have emphasised the vital role of using vocabulary learning Strategies (VLS) in improving vocabulary learning as well as retention (A. Ariffin, 2021; Duong et al., 2021; Ibarra Santacruz, & Martínez Ortega, (2018). For instance, S. R. Alshammari (2020) examined the use of VLS among Saudi university students and found that different strategies, including social and cognitive strategies, significantly contributed to vocabulary acquisition. Similarly, Moustafa Daaboul and Nimehchisalem (2017) explored the vocabulary size of EFL Syrian undergraduates, demonstrating that effective use of VLS could enhance learners' vocabulary development.

This study explores memory strategies, often termed mnemonics, that help support vocabulary retention through imagery or grouping techniques (Schmitt & McCarthy, 2000). These strategies allow learners to link unfamiliar words with concepts they already know (Oxford, 1990). Thus, this study looks at working memory strategies as a subset of vocabulary acquisition strategies, with a focus on how they help with vocabulary retention. According to research, strategies such as imagery and grouping help learners link new vocabulary with familiar concepts, improving both retention as well as comprehension (Schmitt & McCarthy, 2000; Oxford, 1990). Furthermore, research shows that younger learners utilise simpler strategies for vocabulary learning, whereas adults use more cognitively demanding approaches, for example, visualising words (Alsahafi, 2023; Schmitt & McCarthy, 1997; Boers, & Webb, (2018).

Additionally, based on the Depth of Processing Theory, the efficacy of information retention and recall is dependent on the level of cognitive effort performed by a learner. This theoretical paradigm, proposed by psychologists Craik and Lockhart in 1972, claims that memory is a result of the processing depth used to process information (Hadia Hakem Benkhenafou, 2015). Craik and Lockhart's (1972) framework of shallow and deep processing suggests that deep processing promotes active engagement with information through mental imagery and associative linking. This approach aligns with vocabulary strategies that emphasise form, meaning, and collocation to enhance retention. Schmitt's model underscores the relevance of this theory to memory strategies, as vocabulary strategies in the model focus on understanding and recalling word meanings. Furthermore, deep processing supports long-term retention and minimises forgetting, making it a valuable approach for memory strategies in language learning, particularly for EFL learners. Craik and lockhart's (1972) examines how varying levels of cognitive processing

influence memory retention, with particular attention to shallow and deep processing strategies. He describes these two types—shallow and deep processing—as essential components within the depth of processing framework (Craik & Tulving, 1975). The two types are (1) shallow processing, which is defined as a series of repetitive actions meant to temporarily store information in short-term memory, leading to a relatively short retention period, and (2) deep processing, which is defined as an elaboration rehearsal that involves a more meaningful analysis of information using different activities such as mental imagery, deliberate thought, and association or linking of word meanings to previous knowledge. The latter processing mode is associated with long-term retention. This theory is relevant in the field of pedagogy because the two fields are inherently interrelated. The Deep processing is applied in a way that is consistent with vocabulary learning strategies. In these strategies, comprehensive and detailed processing of word knowledge, including form, meaning, and collocation, is associated with increased retention and decreased attrition.

Schmitt's model, on the other hand, is distinguished by the complexity and thoroughness with which it identifies two main groups of vocabulary learning strategies. These are known as discovery strategies, as they assist learners in understanding the meaning of words they hadn't encountered before, and consolidation strategies, as they assist in remembering the meaning of words they have encountered previously. Discovery strategies include determination and social strategies, whereas consolidation strategies include memory, cognitive, and cognitive strategies. Schmitt and McCarthy (1997) state that working memory strategies are a domain that requires complex cognitive processing that helps learners identify a new word with ideas they already know by using grouping or imagery (Oxford 1990).

Working memory is a cognitive construct that facilitates the temporary retention and manipulation of information that is required for complex cognitive processes such as learning, critical thinking, and comprehending other languages (Baddeley et al., 2020). According to Baddeley et al. (2020) three subcomponents that makeup WM are the central executive, the visuospatial sketch pad and the phonological loop. The central executive is thought to be an attentional-controlling system that is crucial for skills like playing chess and is especially vulnerable to the effects of Alzheimer's disease. The visuospatial sketch pad manipulates visual images while the phonological loop stores and practices speech-based information, which is essential for learning vocabulary in both native and second languages.

Academic research has been carried out in a variety of cognitive areas, including tasks like rote learning, problem-solving, and working memory training, as well as the development of mastery in highly specialised fields. The development of working memory skills is essential for improving the learning of new vocabulary, and this is especially true for learners of English as a foreign language (EFL), who use a variety of working memory strategies to achieve their language proficiency (Baddeley et al., 2020; Gathercole et al., 2019; Sala & Gobet, 2020; Wen & Li, 2019; Uchihara, et al.,2022). To What Extent is Collocation Knowledge Associated with Oral Proficiency?)

Working memory strategies (WMS) play an important role in language acquisition, having a clear impact, particularly on collocation incorporation. It is apparent that WMS is vital for language learning and that it can help EFL learners learn collocations systematically. When carrying out cognitive tasks, information must be processed and immediately stored in working memory. This means that when it comes to language learning, it aids students in processing spoken or written language, comprehending its structure, and storing pertinent linguistic components for quick reference (Bozorgian et al., 2022). Working memory is used to process the individual words

and their associations within the collocation when learning and using collocations, which helps with comprehension and retention. Furthermore, WM enables learners to combine linguistic information, which is essential for collocation learning. As learners encounter collocations regularly, working memory assists them in consolidating these word combinations into larger, more easily accessible units. This automation of collocations simplifies language creation and improves speaking fluency over time. In addition, WM allows learners to focus on specific components of language, such as collocations. It aids in the recognition of patterns, relationships, and commonly occurring word combinations.

When learners intentionally focus on collocations, they are more likely to recognise them in natural language use, resulting in enhanced recognition and utilisation in their speech. WM also aids in controlling competition and interference between various linguistic components during language learning. Working memory aids in helping students discern between and use the proper collocation in context when they come across collocations that are similar but distinct (such as "make a decision" vs "take a decision"). When speaking tasks are involved, working memory is essential for efficiently and precisely recovering collocations. The fluency and naturalness of speaking are improved when learners possess well-developed working memory strategies, which enable them to access and utilise collocations more efficiently in real-time communication. The detection and correction of errors are aided by working memory. When students misuse collocations, they can identify and correct these faults with the support of an effective working memory, which promotes continuous progress. Collocations are also transferred from short-term to long-term memory with the help of working memory. Over time, improved retention and recall can result from efficient working memory processing and rehearsal strategies for collocations.

In conclusion, WMS strategies allow speakers to process, identify, and retrieve linguistics components such as collocations more effectively. The capacity of a learner to understand, generate, and employ collocations in spoken language can be greatly impacted by their ability to effectively manage them in WM. Therefore, creating efficient WMS can improve the learning and mastery of collocations, enhancing speaking performance and overall language competency.

This study investigates the use of working memory strategies in learning collocations. The current study focuses on eight out of twenty-seven sub-strategies that are categorised as working memory strategies. The eight strategies are visualising the meaning of the word, relating it to personal experiences, associating it with synonyms and antonyms, connecting the word with its coordinates, utilising new words in sentences, emphasising the first letter of the words using acronyms, using the keyword method, grouping words for study, using cognates, and studying words through physical action. These eight strategies were chosen to provide learners with a variety of strategies appropriate for learning different lexical collocations.

RESEARCH METHODOLOGY

The following tools were used to collect the necessary data:

1. Vocabulary Levels Test (VLT). A vocabulary levels test (Schmitt et al., 2001) was presented at the start of the study to determine the learners' vocabulary levels in both groups (experimental and control). The goal was to determine whether one group was more proficient than another, ensuring that vocabulary proficiency was balanced.
2. The Stimulated Recall Interviews (SRIs) were a useful method for gathering qualitative data in the setting of two experimental groups: one that was exposed to English explanations only and another one that used code-switching as one of the teaching approaches. SRIs method was used to investigate the long-term effects of working memory strategies (WMS) on learning English Lexical Collocations (ELCs) among EFL Arab learners. The major goal was to analyse the impact of WMS on these learners' speaking performance. Furthermore, the study sought to discover the most successful strategy for efficiently resolving challenges encountered by students when learning English lexical collocations (ELCs). The use of SRIs together with the two experimental groups gave a detailed understanding of the learning experience and shed light on the possible efficacy of various methods of instruction, namely the total use of L2 (L2) and the use of the Code-switching (CS) method.

STIMULATED RECALL INTERVIEWS (SRIS)

SRI are a qualitative research tool that elicits participants' Review perspectives on specific experiences or tasks. SRIs, which originated in the field of cognitive psychology and have been adapted for use in a variety of disciplines, involve re-examining, with the use of prompts or stimuli, the thoughts, strategies, and decision-making processes that individuals used during previous activity. (Schindler & Lilienthal, 2022).

This strategy seeks to elicit tacit knowledge, cognitive processes, and subjective perspectives that may not be fully stated during the activity. SRIs give researchers in-depth insights into participants' thought processes, allowing them to better understand their decision-making, problem-solving, or learning experiences in the context of the researched activity. The use of stimuli, such as video recordings, prompts, or artefacts, promotes recall and allows for a more nuanced study of participants' mental processes, thereby giving significant qualitative data to the question under study (Vall et al., 2018).

The Stimulated Recall Interview (SRI) was used to collect data from learners who were engaged with the teacher's explanations while learning English Lexical Collocations (ELC). By incorporating both quantitative and qualitative procedures in this study, the learners' viewpoints on the teaching methods serve to improve the clarity of quantitative data results and add to a more thorough understanding. Understanding participants' perspectives is critical in research because it promotes the discovery of varied experiences that contribute to systematic variance both within and between groups (Fetters & Molina-Azorin, 2017; McCrudden et al., 2019). Thus, Stimulated Recall Interviews (SRI) were conducted with participants to identify the working memory strategies (WMS) used to improve the learning of English Lexical Collocations (ELC) within each different group. SRI has been widely employed as a research approach in a variety of disciplines of educational research, including EFL teaching (Zainil & Arsyad, 2021). It is characterised (Fox-Turnbull, 2019) as a study strategy that encourages participants to recollect their simultaneous thinking during an event when triggered by a video sequence or any other type of memory recall.

The Vocabulary Levels Test (VLT) and Stimulated Recall Interviews (SRIs) are appropriate for this study as they offer a detailed assessment of the effects of working memory strategies (WMS) on English Lexical Collocation (ELC) acquisition. The VLT establishes a baseline for vocabulary proficiency, allowing comparisons between experimental and control groups, which assists in identifying the influence of WMS on ELC acquisition. Simultaneously, SRIs provide qualitative perspectives on learners' experiences, enabling an examination of instructional approaches—English-only explanations versus code-switching—in addressing ELC challenges. This methodology supports understanding of WMS effects on speaking performance and retention among EFL learners.

RESEARCH QUESTIONS

1. What working memory strategies do learners use when interacting with teaching instruction on specific lexical collocations in the two experimental groups?
2. How do the outcomes and productivity of working memory strategies differ between the two experimental groups (L2 and SC) in response to lexical collocation instruction?

PARTICIPANTS

The participants in these groups are between the ages of 18 and 25. Some participants have already completed their college education, while others are about to begin university studies. According to the International English Language Testing System (IELTS) standards and the Common European Framework of Reference for Languages (CEFR), all participants are at the elementary level (A2, B1). The participants exhibit diversity in their national origins, representing a range of Arab countries such as Saudi Arabia, Yemen, Libya, Algeria, Palestine, Tunisia, and Oman. Engaged in the study of English as a foreign language in Kuala Lumpur, Malaysia, their varied cultural and linguistic backgrounds introduce an additional dimension to the investigation. This diversity offers an opportunity to explore potential variations in language learning experiences and outcomes within the context of participants originating from different Arab nations who all speak the standard Arabic language.

RESEARCH DESIGN

In this study, participants were not randomly assigned to different groups; instead, a quasi-experimental design was used. Three groups were randomly assigned to students in the classes: fifteen students were placed in the English-only (L2) group, fifteen students were placed in the Teacher Code-switching (CS) group, and fifteen students were placed in the Control group. The researcher, who was also the participants' language instructor, used a mixed-methods approach to data collection and analysis throughout the course of the experiment. Quantitative data were gained through three speaking tests—pre, post, and post-delay—while qualitative data were gathered through participant interviews.

The current study used stimulated recall interviews to collect qualitative data from participants in the two experimental groups (L2 explanation and code-switching). The stimulated recall interview session was carefully placed following the last delayed post-test, the details of which were discussed in a separate article. The initial plan included the selection of three learners from each treatment group to participate in the stimulated recall interview. The primary goal of each participant's interview was to illustrate their comprehension of the teacher's instructions and

the use of working memory strategies during the classroom intervention, particularly in the context of learning lexical collocations and incorporating them into their speaking performance.

Additionally, the interviews aimed to assess the degree to which participants incorporated various types of lexical collocations into their speaking performance, both before and after the application of working memory strategies. This evaluation was carried out using three speaking tests: a pre-test, a post-test, and a post-delay test. Individual interviews were conducted with eight participants from each of the two experimental groups. Learners were asked about their efforts to leverage and apply the teacher's explanations and working memory strategies for learning lexical collocations for their speaking performance during these sessions. This discussion took place after participants viewed a video clip of the teacher discussing the targeted lexical item, which they had experienced throughout the intervention. The interviews were conducted entirely in English. In response to the learners' feedback, a subset of supplemental questions was developed throughout the interview process. These sub-questions are mostly intended to validate or elucidate the responses made by the participants.

DATA COLLECTION PROCEDURE

To learn about the learners' vocabulary levels of both groups (experimental and control), a vocabulary levels test (VLT) (Schmitt et al., 2001) was conducted at the outset of the experiment. The aim was to ensure that vocabulary proficiency is balanced. Before beginning the teaching intervention, each group performed a pre-speaking test as an initial assessment. After that, each group participated in four weeks of intervention sessions. Following the completion of the teaching intervention sessions, a speaking post-test was given. Following that, a delayed post-speaking test was administered to each group to examine their long-term retention of the target lexical collocations in their speaking performance. Four students from each treatment group took part in a stimulated recall interview one week after the delayed post-tests. The main goal of this article was to answer the research question that investigated the effects of working memory strategies used by students to improve their learning of lexical collocations in their speaking performance. The investigation also sought to ascertain whether the strategies used by the learners in the two groups were consistent.

To emphasise, the justification for employing qualitative analysis was the conviction that it would facilitate an investigation of the working memory strategies employed by the participants involved in the two types of vocabulary instruction. With this strategy, the study aimed to shed light on possible explanations for the observed variations in learning results between the two treatment groups.

STIMULATED RECALL INTERVIEW

A specific methodology is required to investigate the working memory strategies used by EFL learners in learning English lexical collocations during speaking performance in the two groups: the teacher code-switching group and the L2 group. These strategies are addressed through the use of stimulated recall interviews. The following describes how these interviews were conducted:

1. Participant Selection: Identify EFL learners who are participants of the two treatment groups, the English explanation L2 group and the teacher code-switching group. Within each group, the researcher ensures an equitable distribution of participants or a representative sample size.
2. Speaking Tasks: The researcher created speaking tasks to elicit the use of working memory strategies in the context of English lexical collocations. These challenges were tailored to the individual learning styles of each group. For example, a task for the L2 group requires the usage of explanations in English, whereas a task for the code-switching group involves common examples of code-switching.
3. Initial Recordings: The researcher instructed each participant in both groups to complete the speaking tasks while being recorded. Participants were assured that they were aware of the research objectives and that their performances were being recorded.
4. Individual Stimulated Recall Interviews: Following the first recordings, the researcher scheduled individual stimulated recall interviews for each group's participants. During these sessions, the researcher replayed each participant's recorded speaking performances.
5. Prompting Questions: Pose open-ended and probing questions to both groups to elicit insights into the working memory strategies used during their speaking activities. This investigation is carried out while participants watch a video of the researcher carrying out one of the intervention sessions. These are some instances of questions: "Can you describe what you were thinking when you used distinctive smell, رائحة مميزة (p112 Explore Reading book) during your speech?"
   - "Did you have any visualisations or mental imagery in mind while employing collocations?"
   - "How did you organise your thoughts when using collocations in your speech?"
   - "Can you explain your thought process when code-switching or providing English explanations while learning collocations?"
6. Record Responses: For both groups, the researcher recorded the participants' responses during the stimulated recall interviews. Any differences or similarities in the strategies outlined were noted.

DATA ANALYSIS

Initially, the researcher considered the overall scores of participants during their three speaking tests as a means to assess the impact of WMS on their speaking performance. The scores reported here pertain exclusively to those participants in the speaking tests who also participated in the Stimulated Recall Interviews (SRI); they do not include scores for all test participants. Afterwards, the researcher analysed responses separately for each group, focusing on the WMS observed. The researcher closely examined any strategies that appear to be more common or effective in each group. Data triangulation was carried out by comparing findings from stimulated recall interviews with additional data sources, i.e. the three speaking tests; the scores represent the number of lexical collocations the participants used in their three speaking tests, which are shown in Figure 1.

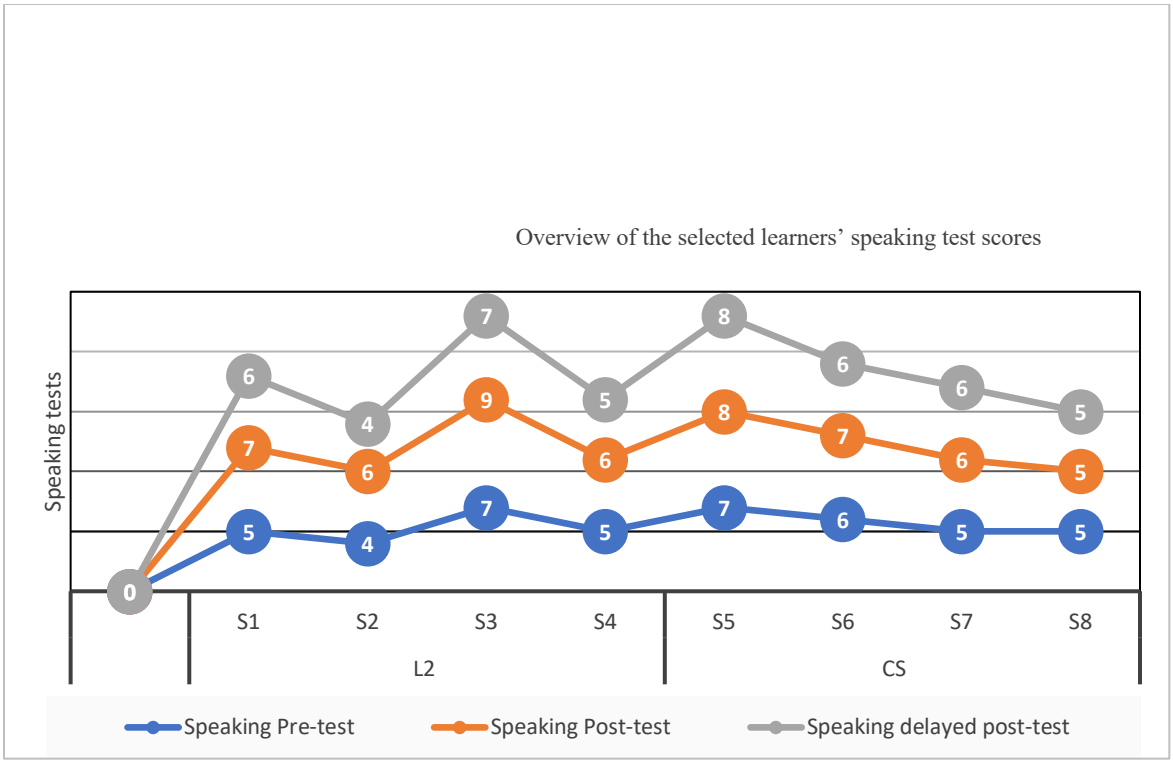

FIGURE 1. Overview of the selected participants' speaking test scores

Figure 1 shows participants' scores across three stages: Speaking Pre-test, Speaking (the blue line) Post-test,(orange line), and Speaking Delayed Post-test(the grey line). The results are grouped by category: L2 (S1–S4) and CS (S5–S8). Each line indicates the number of lexical collocations used by participants during each stage, allowing for an analysis of their performance patterns over time.

THE STEPS INVOLVED IN THE ANALYSIS PROCESS

A structured analysis process was used to investigate the patterns and strategies for learning English lexical collocations. Identify preliminary codes- those from the data and those from earlier research- and organise them into a code. Thus, each code was given a name, definition, and example taken directly from the transcripts. Two transcripts, one for each treatment group, were selected at random and subjected to a comprehensive assessment. Through a detailed investigation, important strategies were identified from three perspectives: learners' learning of English vocabulary, their reactions to teachers' explanations of vocabulary, and their ability to recall particular lexical collocations. The study selected six types of English lexical collocations, categorised as follows: adjective-noun (e.g., heavy rain, bright idea); verb-adverb (e.g., whispered softly); verb-noun (e.g., book a flight, pack a suitcase, take risks); noun-noun (e.g., departure time, discount rate, driving license, debit card); adverb-adjective (e.g., highly recommended, actively involved); and noun-verb (e.g., wind howls). These collocations were used during stimulated recall interviews.

After the instances were identified, the next step was to evaluate and code the eight transcripts systematically. SRI analysis incorporates both qualitative and possibly some quantitative elements.

QUALITATIVE ANALYSIS

The interview responses were transcribed word by word, retaining the dialogue's verbatim essence. The researcher applied codes that utilise various Working Memory Strategies (WMS) to evaluate the outcomes of the learning process. Additionally, the researcher recorded any obstacles encountered and documented participant choices to summarise significant themes or patterns in each response and ensure coherence. The researcher categorised replies into overarching topics such as the consequences of code-switching, the effectiveness of mnemonic devices, the need for practice and repetition, and the impact of interactive learning modes such as games.

QUANTITATIVE ANALYSIS

The researcher determined the frequency of occurrence of particular Working Memory Strategies (WMS) that were used in learning ELC and their effects on learners' speaking performance. To address the two research questions in this study: 1) What working memory strategies are typically used by EFL learners in learning ELC? 2) How do these strategies affect learners' speaking performance? The researcher conducted a thematic analysis of open-ended responses to identify recurring themes and patterns. The interpretation of the responses was then analysed to answer the research questions. Finally, integrating qualitative insights with quantitative data can provide a full understanding of the effects of WMS on EFL learners' speaking performance.

DISCUSSION

The data generated is subjected to quantitative analysis to address each SRI and identify effective working memory strategies in ELC learning for SRI participants. Table 1 reveals the insights about the WMS used by EFL Arab learners in two treatment groups. Despite the short sample size, the data provides insightful hints for teachers to maximise EFL learning opportunities. Firstly, with 62.5% of participants choosing this strategy, it is clear that interactive learning predominates among the employed strategies. This implies that stimulating exercises and group projects are essential for helping students retain collocations. Second, practice and repetition play a major role (25%), emphasising the value of regular exposure to collocations. This is consistent with the habitual memorisation and regular drills that are characteristic of traditional language learning approaches. To keep participants interested and increase efficacy in learning ELC, interactive events should consider repetition. Chunking, a method of organising related data, is interestingly less common (12.5%). This could result from the data's constrained scope or the students' familiarity with the particular collocations. Maybe chunking strategies become more relevant when learners come across more complicated collocations. This is something that might be investigated further.

TABLE 1. WMS used by participants in SRI

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	**Repetition and Practice**	2	25.0	25.0	25.0
	Chunking	1	12.5	12.5	37.5
	Interactive Learning	5	62.5	62.5	100.0
	Total	8	100.0	100.0	

In Figure 2, the chart depicts the most effective Working Memory Strategies (WMS).

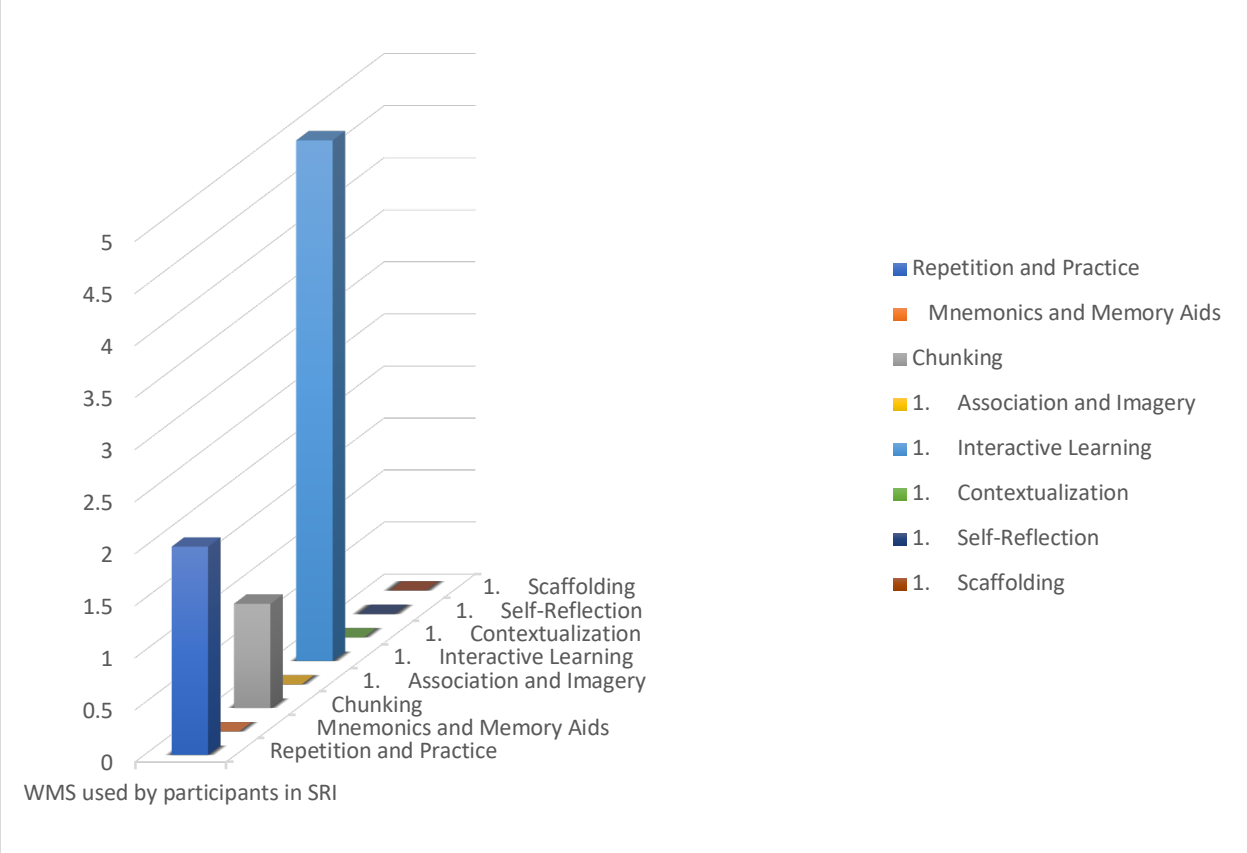

FIGURE 2. The most effective Working Memory Strategies (WMS)

In general, the bar graph indicates how crucial it is for EFL Arab learners to employ a variety of working memory strategies. Even if interactive learning is becoming more and more popular, speaking fluency and collocation mastery could be further improved by combining interactive learning with practice, repetition, and possibly chunking. Furthermore, the more effort a student puts into manipulating knowledge, the more successfully it is stored and preserved in memory, according to the Depth of Processing Theory. This theory, which was put forth by psychologists Craik and Lockhart (1972), presents the concept that memory is merely a byproduct of the depth to which information is processed. They propose that there are two ways in which information can be processed: shallow processing and deep processing. The second leads to long-term retention. Considering both fields are interrelated, the hypothesis can be applied to teaching. Deep processing corresponds to memory vocabulary learning procedures in such a manner that

deep and extensive processing of word knowledge (in terms of form, meaning, and even collocation) can lead to improved retention and decreased attrition.

Participants in both treatment groups used various WMS to learn English Language Collocations (ELC) and incorporated these strategies into their speaking performance. Participants in the code-switching group were provided with translations of new collocations, resulting in a reduced dependence on WMS at first due to their knowledge of meanings. However, they noticed that they needed to use more WMS to properly recall the collocations over time. Furthermore, L2 group members depended on explicit learning through English-only exposure to collocations and actively using their WMS throughout the learning process. They used mnemonic devices, repetition, and association techniques systematically to improve their memory and recall ELC. The differences in strategy use seen between the two groups provide important insights into the impact of explicit learning strategies on the development and integration of Working Memory strategies in the learning of collocational knowledge.

CONCLUSION

The study found that specific working memory strategies (WMS) provide significant support to English language collocation (ELC) learning and improve learners' speaking performance. Interactive learning strategies and memory-enhancement strategies had positive outcomes, with learners demonstrating individual preferences and varying effectiveness levels.

Suggestions for future research include investigating the impact of various learning methods, such as explicit learning and code-switching techniques, on how language learners acquire and remember English language collocations (ELC). Furthermore, further investigation should include examining the lasting effects of these interventions on language proficiency and communication competence. In addition, future research should also consider recruiting a diverse group of language learners with varying levels of English proficiency to examine the long-term durability of learning results and the necessity for ongoing use of WMS.

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