Gender Differences on the Use of Memory Strategies of ESL Learning in Higher Education

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ABSTRACT
Mastery of memory strategies is helpful for English language learners to store and recall related information. However, rote memorization is more commonly practiced by ESL learners, although it is not an effective method because it does not help in the development of either language or communication skills. The purpose of this study is to analyse gender differences in the use of memory strategies in ESL learning among Malaysian higher education students by identifying the relevant activities that promote comprehension and memory. Using stratified random sampling, 460 male and female students from public and private higher education institutions were included in the study. Data collection was done using a questionnaire with the items taken from the Oxford' Strategy Inventory of Language Learning (SILL). Analysis shows that the item involving physically acting out new English words yielded the highest mean score for both genders. For optimal learning experience, the focus in a mixed-gender classroom should be on shared values between the genders, while a different approach may be taken in a classroom with only male or female students. It is worthwhile to reevaluate the materials used in the English classroom, especially at the tertiary education level in order to create a productive and effective language learning experience among future graduates.

Keywords: ESL learners, gender, memory strategies

INTRODUCTION

The choice of language learning strategy is a critical factor that significantly affects second/foreign language acquisition. Language learning strategies (LLS) comprise a set of intentional cognitive processes that learners employ to facilitate their language learning journey and ultimately achieve their desired language level (Kashefian-Naeeini et al., 2011). The use of appropriate strategies not only accelerates the learning process but also enhances learners' self-efficacy in acquiring the target language (Ahamad & Abdullah, 2019; Balini & Jeyabalan, 2018). Although Oxford (1990) proposed 62 strategies, this study aimed to investigate the gender difference in the use of memory strategies for learning English as a second language (ESL) among Malaysian university students. Understanding such differences can potentially lead to tailored teaching approaches to meet the different needs and preferences of learners of different genders.

The practice of memorization is widespread among English language learners, especially in Malaysia where students are taught to memorize words to increase their vocabulary. While memorization can be useful for this specific purpose, rote learning, which is commonly practiced among older students in secondary and higher education, does not contribute to the development of language skills. Rather, it can hinder the process of cultural integration as learners focus more on test performance than contextual understanding. Research showed that children can acquire language skills naturally if they are exposed to language in context before the age of 12. However, once they reach this age, they tend to rely on memorization, which can lead to a context-less approach to learning. Consequently, many college students in Malaysia have difficulty using English as a medium of learning and communication. It can be difficult for them to achieve the desired exam results, which can negatively affect their cumulative grade point average (CGPA).

Moreover, university English courses differ significantly from those in schools. Instead of focusing on language mechanics such as syntax and grammar rules, learners are expected to master various communication skills for different purposes. Their English skills are assessed by their ability to role-play, give presentations, pitch ideas, write academic papers, and negotiate effectively. Although these activities are essential parts of the language learning process, learners must use effective memory strategies, rather than relying solely on memorization, for these activities to be productive. Memory strategies fall under the umbrella of metacognition, which encourages learners to become aware of their own learning and memory and to look for ways to improve. By improving their memory strategies, learners can achieve better results in language learning and communication, thus improving their performance in university-level English courses.

LITERATURE REVIEW

The topic of language learning strategies (LLS) has been extensively discussed by prominent researchers such as Faerch and Kasper (1983), O'Malley et al. (1985), Wenden and Rubin (1987), Cohen (1990), Oxford (1990), Intaraprasert (2000), Habok et al. (2022), as well as Zou and Lertlit (2022). While there are several definitions and taxonomies of LLS, this study focuses specifically on the development of memory strategies in language learning, which have been discussed since the 1960s.

Researchers have primarily focused on analysing learners' thoughts and actions during the language learning process. Wenden and Rubin (1987), as cited in Arellano (2017), defined LLS as the plans, steps, or routines employed by learners to facilitate the process of acquiring, storing, retrieving, and using information. Cohen (1990) expanded this definition by considering learners' conscious decision-making in selecting the processes that enhance engagement and learning and ultimately improve the use of a second language by encoding, storing, retaining, recalling, and applying target language knowledge.

Developing effective memory strategies for language learning is essential for improving language skills by enabling learners to more easily store and recall new vocabulary and information. Memory strategies include techniques such as association, repetition, visualization, and elaboration, which have been shown to be particularly effective in storing and retrieving new language knowledge. By promoting the development and use of memory strategies in language learning, teachers and learners can improve the effectiveness of their language learning process and ultimately their language proficiency. Despite the significant role of memory strategies in ESL learning, Zou and Lertlit (2022) found that they are the least frequently used learning strategy category among Chinese students in cross-cultural contexts in Thailand, as opposed to compensation strategies. Similarly, a study by Alrashidi (2022) on English language students in Saudi Arabia reported that memory strategies are the least frequently used compared to metacognitive strategies in English language learning.

Rote memorization and memory strategies are distinguished by language comprehension as the key concept of language learning. Moreover, rote memorization is considered a lower form of learning because it does not involve deeper analysis (Balini & Jeyabalan, 2018), while memory strategies involve learning comprehension, which requires cognitive skills. Memory strategies make learning more stable and indispensable, as the internalization of information in the learning process of students is conscious and analytical. The studies of Gernsbacher (1991; 1997) on the influence of memory on language acquisition have described several sub-processes involved in memory strategies that begin with the formation of a foundation for building the learner's mental structure, which later draws on incoming information that is coherent with the existing information. When the incoming information is less coherent with the existing information, a new substructure is built that forms a new foundation. Indeed, it is likely that most representations have multiple branching substructures. Gernsbacher (1991) also provided an interesting overview of mental work in the learning process. Mental structures are built by memory nodes that are activated by incoming stimuli. The initial activation of incoming information forms the basis of mental structures, which become the basis for subsequent information. However, the only information that is coherent with the existing basis potentially activates the same or connected memory nodes. In contrast, less coherent new information is less likely to activate memory nodes. Instead, it forms a new foundation for a new substructure. The activated nodes will begin to transmit processing signals to enhance or suppress other nodes. Therefore, memory strategies are essential for language learning as they involve deeper comprehension and cognitive processing, leading to the formation of a stable mental structure for long-term retention. Gernsbacher's findings provided valuable insights into the component processes involved in memory strategies, highlighting the importance of coherent incoming information and the formation of a strong foundation for building mental structures.

The activation of memory nodes for language learning and comprehension is based on two mechanisms of enhancement and suppression (Gernsbacher, 1991; 1997). According to these, memory nodes are enhanced when the information they represent is needed to build further structures, while they are suppressed when the information is no longer needed. This could explain why memory strategies are more effective for language acquisition than rote learning, as described in the literature on language learning strategies. The early findings of Gernsbacher (1991; 1997) suggested that high and continuous input of the target language is crucial for building new mental structures and improving existing ones. Effective teaching and learning methods can facilitate this process, which is essential for successful language acquisition. Therefore, language teachers must employ instructional strategies that provide ample opportunities for learners to engage with the target language in meaningful and authentic contexts.

Rote Memorization and Memory Strategies in Language Learning
According to Sinhaneti and Kyaw (2012), the focus of research on second language teaching and learning has shifted from finding the perfect teaching method to understanding how successful teachers and learners achieve their goals. This has led to several studies that examined language learning strategies to improve existing ones or develop new ones. In particular, the importance of vocabulary in EFL and ESL has led to a growing awareness of the specific area of memory strategies. Balini and Jeyabalan (2018) and Sinhaneti and Kyaw (2012) have conducted studies that emphasize the retention and reproduction process of memory strategies. Sinhaneti and Kyaw (2012) also noted that repetition is a frequently discussed learning strategy in language research because it is associated with memorization strategies. However, Li (2009) defined rote learning as repetition, memorization, and practice of vocabulary learning strategies (VLSs), which may be unnecessary and even undesirable if they lead to repetition without comprehension. Consequently, language learners need to be aware of the appropriate use of repetition to improve their learning process.

Kember (2000) argued that the rote learning which results from didactic teaching methods can discourage learners from using the Deep Approach or critical thinking strategies. In other words, curriculum design and teaching approach may affect the learning strategies that students use. Conversely, teachers may assume that their students prefer memorization and design their courses accordingly. However, Marton et al. (1996) indicated that memorization may precede comprehension, and that meaningful memorization is more common among distance learners than among face-to-face learners (Kember & McKay, 1996; Watkins, 1996). Previous research has also shown that learning based on understanding can expand learners' thinking and influence their personality and behavior. Therefore, it is important to distinguish between memorization and memory strategies, as incorporating memory strategies into language learning can improve retention and recall of vocabulary for effective communication (Oxford, 1990). In this way, English language learners can develop their language skills and improve their fluency.

According to Arellano (2017), early researchers emphasized the importance of language learning strategies (LLS) to facilitate the learning process. Memory strategies, as mentioned by Wenden and Rubin (1987) and Cohen (1990), involve planning actions to enhance learning, including knowledge recall, retention, retrieval, and use of learned language. Memory strategies are particularly useful in second language classrooms for storing and retrieving new vocabulary

and information acquired through language use (Balini & Jeyabalan, 2018). As such, memory strategies have been shown to play an important role in language learning. By incorporating memory strategies into their learning process, language learners are better able to retain and retrieve their vocabulary, leading to improved language proficiency.

Several researchers have identified different types of strategies that learners can use to enhance their language learning skills. Memory strategies have been referred to as direct strategies by Arellano (2017), Cohen (1990), and Oxford (1990), and are particularly useful for storing and retrieving vocabulary and other information learned in the language classroom. On the other hand, motivation is an indirect strategy that can have a positive impact on language learning by increasing learners' desire and willingness to engage in the learning process.

Metacognitive strategies are another indirect strategy that allows learners to take control of their own cognition and include techniques such as self-observation, planning, and evaluating their learning progress. Affective strategies, on the other hand, deal with learners' emotional state, including their attitudes and motivation toward language learning, and can help learners manage their emotions more effectively. Finally, social strategies enable learners to interact with native speakers and use the target language more frequently, facilitating language acquisition through social interaction. Despite the effectiveness of various indirect strategies in language learning, this study focuses specifically on the use of memory strategies in English language learning. Through the use of memory techniques, learners can improve their ability to store and recall new vocabulary and information, leading to improved language mastery over time.

METHODOLOGY

In this study, the recommendation of Krejcie and Morgan (1970) for a maximum number of 384 respondents was adopted because the target population is nearly 1000000. The sample size formula is based on the predetermined target or attainable population. The researchers also specified a fixed alpha of 0.05 and a precision level of 0.05; therefore, there is no requirement for determining statistical power and effect size. In addition, probability sampling was used to ensure that the results were valid and representative of the target population. To apply a probability sampling design, the researchers must first determine the appropriate target population, and samples are usually drawn from lists of units that encompass the entire population, which is called a sampling frame. One of the sample characteristics in the present study was the type of higher education of the respondents, i.e., whether it was a public or private university. In addition, respondents had to indicate their current level of education since this study focused on two groups of students, namely graduate and undergraduate students. The present study focused on students pursuing these degrees in order to have better control over the sample size.

A stratified random sample was used in this study because it involved a large number of university students and the number of students changed over time. It also allowed the researchers to control for the two sources of bias, namely the problem of under-sampling and the problem of non-response. The sample was formed by dividing the number of students into non-overlapping groups called strata. Then, a specific number of samples was selected for each stratum. In general, the sample size for each stratum was chosen in proportion to the actual size of the target population,

so that it was a proportionate stratified random sample. In this approach, the elements of the population were divided into different strata to obtain non-overlapping groups from which samples were then randomly selected. In this study, four strata were formed; Strata I and II were male and female students at public institutions, while Strata III and IV were male and female students at private institutions. The percentages of Strata I, Strata II, Strata III, and Strata IV were 17%, 29%, 25%, and 29%, respectively. This sampling method is considered precise, manageable, and flexible. Moreover, the boundary of estimation error in this method is practically smaller than other methods.

In addition to the selection of the sample and its size, the choice of the right instrument to measure memory strategy is equally important. In this study, the memory strategy component of the Oxford' Strategy Inventory for Language Learning (SILL) was used to examine the use of memory strategies in English language learning. SILL is generally used to describe the different types of language learning strategies that learners use to learn a new language. These strategies are classified into the following six types: Memory strategies, Cognitive strategies, Compensatory strategies, Metacognitive strategies, Affective strategies, and Social strategies. Griffiths (2003) and Gobel and Mori (2007) agreed that this instrument is usually used to examine the most commonly used strategies in different contexts and environments. It has also been used by many researchers studying ESL/EFL for various purposes. Since this study focused on the use of memory strategies in ESL learning, only seven items were adopted and adapted from the memory strategies segment. An exploitation factor "When I have appropriate contact with ESL..." was added to each selected item. Table 1 shows the items used to measure Malaysian ESL learners' use of memory strategies and the activity categories each item fell into.

Table 1.
Memory Strategy Items

Code	Items	Categories of activity
MEM1	When I receive adequate exposure to ESL, I use new English words in a sentence so I can remember them.	Employing action
MEM2	When I receive adequate exposure to ESL, I can remember a new English word by making a mental picture of a situation in which the word might be used.	Creating mental linkage
MEM3	When I receive adequate exposure to ESL, I review English lessons often.	Reviewing well
MEM4	When I receive adequate exposure to ESL, I physically act out new English words.	Employing action
MEM5	When I receive adequate exposure to ESL, I learn to use rhymes to remember new English words.	Applying images and sounds
MEM6	When I receive adequate exposure to ESL, I can connect the sound of a new English word and an image or picture of the word to help remember the word.	Applying images and sounds
MEM7	When I receive adequate exposure to ESL, I think of the relationship between what I already know and new things I learn in English.	Creating mental linkage

FINDINGS

Despite the recommendation of 384 respondents, 460 responses were obtained through the dissemination of the Google form to the identified students of public and private higher education institutions in different states throughout Malaysia. In addition, the gender distribution was pre-determined as it was known that the target population consisted of 42% male and 58% female graduate and undergraduate students from public and private institutions. After data cleaning, 445 cases were selected for further analysis, of which 207 were from public institutions and 238 from private institutions. Approximately 39.6% of students at public institutions were pursuing a diploma degree, while the remaining students were pursuing a bachelor's degree. The ratio of diploma and bachelor's degree students at private institutions was 59.2% and 40.8%, respectively. In general, the distribution of students from both types of higher education institutions was almost equal, with 50.1% diploma students and 49.9% bachelor's students.

Of the final total number of respondents, 72 (16%) and 106 (24%) were male students from public and private institutions, respectively. The remaining respondents were 135 (30.3%) and 132 (29.7%) female students from public and private higher education institutions, respectively. The above percentages were based on the averaged totals for 2018 and 2019 reported by the macro higher education institutions and published by the Malaysian Ministry of Higher Education (MOHE). Items adapted from Oxford's Strategy Inventory for Language Learning (SILL) were used to analyse gender differences in the use of memory strategies in ESL learning among Malaysian university students by identifying the relevant activities that promote comprehension and memory. Table 2 and Table 3 show the results of the analysis for each gender.

Table 2.
Descriptive Analysis for Memory Strategies on Male ESL Learners

Male	Items	Mean	SE
	MEM4	5.63	1.211
	MEM5	5.58	1.133
	MEM3	5.57	1.083
	MEM2	5.55	1.115
	MEM7	5.54	1.203
	MEM6	5.48	1.213
	MEM1	5.36	1.191

Table 3.
Descriptive Analysis for Memory Strategies on Female ESL Learners

Female	Items	Mean	SE
	MEM4	5.80	1.094
	MEM3	5.73	1.041
	MEM2	5.71	1.057
	MEM7	5.71	1.115
	MEM5	5.64	1.086
	MEM1	5.49	1.164
	MEM6	5.49	1.135

The tables above show that the strategy of acting through physical action (MEM4) is very popular among both male and female students, with a mean of 5.63 and 5.80, respectively. In contrast, the use of action through the use of new words in sentences (MEM1) is the least popular among male learners (M=5.36), followed by the use of image and sound through the association of the sound of a new English word with an image or picture of the word (MEM6) with a mean of 5.48. Female learners, on the other hand, reported the same mean of 5.49 for both items MEM1 and MEM6. In addition, the majority of male learners chose to use the picture and sound strategy by using rhymes (M=5.58) as their second favourite strategy. The strategy of looking up well was ranked third (M=5.57) and second (M=5.73) by both male and female learners, respectively. Finally, the mental linking strategy, which consists of making a picture of a situation in which the word could be used (MEM2) and thinking of the relationship between the existing and new English knowledge (MEM7), yielded the same mean score of 5.71 for the female learners, while the male learners preferred MEM2 (M=5.55) with only a slight difference compared to MEM7 (M=5.54).

The overall results of this analysis show the different preferences of male and female ESL learners in Malaysian higher education in terms of memory strategies. The activity of using rhymes to memorise new English words shows the greatest difference between genders as it is strongly preferred by male students but not by female students. This suggests that the use of songs in ESL classes generally has a more positive effect on male students. However, language teachers should pay attention to reciprocal readiness, i.e., the use of strategies that involve physical action, especially in mixed classes. Activities that involve physical action include role-playing, simulation sessions, and forums.

As suggested in Oxford's Language Learning Strategies (LLS), students can be given activities to create mental linking strategies for memory formation, which consist of forming a mental picture of a situation in which the word might be used and thinking of the relationship between the existing and new information in English to perform individually. However, in order for these strategies to be used effectively, teachers must guide students well, whether through effective instruction or by developing activities such as conversation cards and task cards with pictures to promote memorization and comprehension.

DISCUSSION AND CONCLUSION

The results of this analysis show that male and female ESL learners in Malaysian HEIs have different preferences for memory strategies. Specifically, the use of rhymes to memorize new English words was found to be strongly preferred by male students but not by female students. This suggests that the use of songs in ESL classes generally has a more positive effect on male students. These findings have important implications for language teachers. Teachers can better tailor their instructional strategies to meet the needs of their students if they are aware of their different preferences. For example, incorporating rhymes or songs into ESL lessons can be an effective way to improve vocabulary memorization and enhance students' language learning experiences. This may lead to better learning outcomes for both male and female students.

Another important conclusion from the findings is that teachers need to provide a variety of activities to accommodate different learning preferences. For example, male students may be

more engaged if the activities involve physical actions, such as role-playing, while female students may prefer more cooperative activities. By providing a range of activities that address different learning preferences, teachers can help keep their students motivated and engaged. The findings also underscore the importance of gender-responsive classroom practices. By recognizing the potential gender differences in learning preferences and adjusting their instructional strategies accordingly, teachers can create a more inclusive and equitable learning environment for all students. This can ultimately lead to greater instructional effectiveness and better learning outcomes for all students.

Memory strategies are undoubtedly an important contribution to language learning. However, some studies show that language learners rarely report using these strategies, as described in a study with Hong Kong university students (Wang et al., 2021). They also found that "rote learning" did not help to improve students' English proficiency. One possible explanation could be that they are not aware of how often they actually use memory strategies, so this study focuses on LLS' memory strategies to raise their awareness of them. It is also important that language teachers make a sincere effort to reinforce appropriate memory strategies to help Malaysian ESL learners in higher education improve their English language proficiency. In a mixed classroom, the focus should be on shared values between genders to achieve the best possible learning experience, while in a classroom with only male or female students, different approaches may be used. It is also worthwhile to reevaluate the materials used in the English classroom, especially in higher education, to create a productive and effective language learning experience for future graduates.

In summary, the results of this analysis provide important insights into the different preferences of male and female ESL learners in Malaysian higher education. By applying teaching strategies that address these preferences, teachers can create a more engaging and effective learning environment for all students. Since this study is a quantitative analysis of the use of memory strategies in ESL learning between genders, the results are limited to theoretical findings. A qualitative study is recommended for further research on different types of memory strategies in ESL learning in general and among university students in particular.

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Conflict of Interest

We certify that the article is the authors' original work. The article has not been submitted for publication nor has it been published in whole or in part elsewhere. We testify to the fact that all authors have contributed significantly to the work, validity and legitimacy of the data and its interpretation for submission to this journal.

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Authors' Contributions

Tg Liyana carried out the research plan, conducted data collection and analysis, and took the lead in writing the manuscript. Wan Nazihah provided feedback, reviewed and assisted in completing the manuscript.

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