# Exploring Perceptual Learning Styles and Vocabulary Retention among Libyan EFL Students at Derna University

Salah A. Adam [1*] , Maryam A. Bin khayal [2]

[1] Faculty of Languages, Omar Al-Mukhtar University, Al-Bayda, Libya
[2] Researcher, School of Languages, Libyan Academy for Graduate Studies - Al-Jabal Al-Akhdar Branch, Al-Bayda, Libya

**استكشاف أنماط التعلم الإدراكي واحتفاظ المفردات لدى طلاب اللغة الإنجليزية كلغة أجنبية الليبيين في جامعة درنة**

صلاح عبد الحميد فرج ادم [1*]، مريم علي بن خيال [2]
[1] كلية اللغات، جامعة عمر المختار، البيضاء، ليبيا
[2] باحثة، مدرسة اللغات، الاكاديمية الليبية للدراسات العليا ـ فرع الجبل الأخضر، البيضاء، ليبيا

*Corresponding author: salah.adam@omu.edu.ly*

**Abstract:**

The present study investigated the effectiveness of perceptual learning styles in facilitating vocabulary learning and retention. The study employed an experimental research design, utilizing quantitative methods to address the research questions. The participants were 30 EFL Libyan students at Derna University who were randomly assigned to two groups : a control group and an experimental group, with 15 students in each group. The instruments used for data collection were: a pre- test (TOEFL vocabulary test) to assess the students' proficiency level and to select a study sample, Perceptual Modality Preferences Survey (PMPS) to identify the students' most preferred learning styles and a vocabulary post-test to measure vocabulary retention. A pilot study was conducted at the outset of the study to assess the pre-test and the PMPS. The collected data was analyzed using the Statistical Package for the Social Sciences (SPSS). The findings revealed that interactive learning style was the most preferred by the participants followed by visual and print learning styles. The findings also showed that there was not a significant difference between the control and experimental groups which indicated that learning styles did not significantly influenced vocabulary retention. In addition, the post-test results demonstrated that the interactive students achieved a higher mean score than visual and print students. However, the performance of the students with the three learning styles was not statistically different.

**Keywords:** vocabulary retention; perceptual learning styles, EFL learners.

**الملخص**

تناولت الدراسة الحالية فعالية أساليب التعلم الإدراكي في تسهيل تعلم وحفظ المفردات . وقد اعتمدت الدراسة على المنهج التجريبي وذلك باستخدام الأساليب الكمية لمعالجة أسئلة البحث. اشترك في هذه الدراسة 30 طالبًا ليبيًا من طلاب اللغة الإنجليزية كلغة أجنبية درنة في ليبيا. و تم تقسيمهم عشوائيًا إلى مجموعتين : مجموعة ضابطة ومجموعة تجريبية، بواقع 15 طالبًا في كل مجموعة. وكانت الأدوات المستخدمة لجمع البيانات هي: اختبار قبلي لتقييم مستوى الطلاب واختيار عينة الدراسة، واستبيان أساليب التعلم الإدراكية (PMPS) لتحديد أساليب التعلم المفضلة لدى الطلاب، وكذلك الاختبار البعدي لقياس حفظ المفردات. كما أُجريت دراسة تجريبية في بداية الدراسة لتقييم الاختبار القبلي واستبيان أساليب التعلم الإدراكية. وتم تحليل البيانات التي تم جمعها باستخدام الحزمة الإحصائية للعلوم الاجتماعية (SPSS). أظهرت النتائج أن أسلوب التعلم التفاعلي كان الأكثر تفضيلاً من قبل المشاركين، يليه أسلوب التعلم المرئي والقرائي /الكتابي. وأظهرت النتائج أيضًا أنه لا يوجد فرق كبير بين المجموعتين الضابطة والتجريبية مما يشير إلى أن طرق التدريس المبنية على أساليب التعلم المختلفة لم تؤثر بشكل كبير على حفظ المفردات. بالإضافة إلى ذلك، أظهرت نتائج الاختبار البعدي أن الطلاب ذوو أسلوب

التعلم التفاعلي حققوا متوسط درجات أعلى من الطلاب ذوي الأسلوبيين المرئي والقرائي/ الكتابي. ومع ذلك، فإن أداء الطلاب ذوي أنماط التعلم الثلاثة لم يكن مختلفا إحصائيا.

**الكلمات المفتاحية:** حفظ المفردات، أساليب التعلم الإدراكية، متعلمو اللغة الانجليزية كلغة أجنبية.

## 1. Introduction

".while without grammar very little can be conveyed, without vocabulary nothing can be conveyed."(Wilkins, 1972, pp.111-112). Wilkins' proposition about the importance of vocabulary in language learning and proficiency has garnered widespread acceptance from academics and specialists in the field. This consensus emphasizes the critical relevance of vocabulary development in the overall language learning process. Nation (2001), for example, highlights the importance of a robust vocabulary base in order for learners to grasp and produce meaningful language. The capacity to understand and employ a wide range of words allows learners to engage with various linguistic situations and effectively communicate their thoughts. Given the importance of vocabulary, it is important to consider the most effective ways by which it is taught and learned. language teaching and learning have shifted tremendously from an emphasis on teacher-centered instruction to learner-centered instruction. This shift has led to a growing focus on individual learner differences (such as age, anxiety, aptitude, gender, motivation and self-esteem) which answer such questions as what characteristics shared by good language learners, and why some learners progress more quickly and effortlessly than others (Rossi-Le,1989). Learning style is also another variable. Within scholarly discussions, the term learning style is characterized by a diverse range of definitions and conceptual frameworks. Generally, it refers to the individuals' preferred methods of learning. Oxford (2003) identifies four dimensions of learning styles that are particularly relevant and strongly linked to second language learning ( L2 learning): sensory preferences, personality types, desired degree of generality, and biological differences. It is evident that learning styles encompass not only the cognitive domain, but also the affective and physiological domains (Cornett,1983; Keefe,1985; Oxford,2003). In addition, several models have been put forth by researchers and scholars as theoretical frameworks to facilitate comprehension and classification of learning styles. One popular modal is VARK (Visual, Auditory, Reading/Writing, and Kinesthetic) developed by Fleming (1995), which classifies learners into four main categories: Visual, Auditory, Reading/Writing, and Kinesthetic. Visual learners prefer learning through visual stimuli (e.g. diagrams, charts and images) while auditory learners prefer listening and oral explanations, such as through discussions, lectures and audio recordings. Reading/Writing learners learn best through text-based materials and Kinesthetic learners prefer hands-on experiences. Another well-known model is Dunn and Dunn's (1974) model developed by Rita Dunn and Kenneth Dunn which categorizes learners according to various dimensions. These include environmental factors ( such as, sound, light, temperature and seating arrangements), as well as the learning modalities ( i.e. visual, auditory and tactile). Moreover, the model considers the social preferences, that is, some students may find it easier to study alone and need few interruptions whereas others may flourish in group environments. The model also takes into account the time-of-day preferences since different individuals may have variations in their optimal time of learning. However, it is worth noting that the concept of learning style is the subject of debate, with advocates and opponents presenting different viewpoints. On one hand, Advocates contend that recognizing and accommodating learning styles optimizes the learning experience (Dunn, 1988; Dunn et al., 1989; Ehrman, 1996). On the other hand, opponents of learning styles argue that there is little scientific evidence to support the effectiveness of tailoring instruction to match learning styles and that it is important to focus on evidence-based instructional practices (Kirschner & Merrienboer, 2013; Pashler et al., 2008; Willingham, 2018). Therefore, this paper aims to delve into the ongoing debate regarding the impact of learning styles on language learning outcomes of English as a Foreign Language (EFL) Libyan university students, with a specific focus on perceptual learning styles and vocabulary retention. This entails exploring whether or not different perceptual modalities may influence the learning and retention of vocabulary.

## 2. Literature Review
### 2.1. The Concept of Learning Style

Students employ a variety of general approaches which Oxford et al.(1990) refer to as language learning styles in order to study a new subject or take on a new challenge. Pashler et al. ( 2008) referred to learning styles as the idea that different people will respond differently to different types of instruction or study whereas Cornett (1983) described learning styles as patterns which can provide guidance for learning.

### 2.2. Conflicting Research Findings on Learning Styles

Some studies have reported positive associations between learning styles and improved learning outcomes. For example, Naimie et al. (2010) conducted a study on 310 English Major Students and four lecturers from the Foreign Languages, Faculty of Azad University, Iran. The results revealed that accommodating learners' needs and preferences resulted in higher attainment. However, other research findings bolster the arguments put forth by those skeptical of learning styles. For instance, Sabag and Trotskovsky (2014) examined the impact of

matching instructional strategies with learning styles. The findings of this study did not support the notion that a strong alignment between learning styles and instructional strategies significantly impacts students' academic achievement.

## 2.3. Sensory/Perceptual Style Preferences

Sensory/perceptual preference refers to the preferred sensory modality a learner uses to process new information. The four basic categories of sensory preferences are visual, aural, kinesthetic and tactile. Visual learners enjoy reading and benefit greatly from visual stimulus. By contrast, auditory learners are at ease without visual stimulation and hence benefit from oral input. Students that are tactile and kinesthetic tend to move around a lot and appreciate working with tangible items (Oxford, 2003).

## 2.4. Sensory/Perceptual Learning Style and Academic Achievement

Research on sensory/ perceptual modalities went further to find out what impact those modalities can have on learning. Some studies around the world argued that there is no correlation between perceptual learning styles and academic achievement of learners ( Al-Zayed, 2017; Brahmakasikara, 2013; Herizal, 2018). Nonetheless, other studies on English learners claimed that perceptual learning styles play a role in learners' academic achievement (Hamed and Almabruk, 2021; Hidaya et al., 2022).

## 2.5. Sensory/Perceptual Learning Styles and Vocabulary Retention

The relationship between perceptual learning styles and vocabulary retention has been the focus of many studies mostly conducted in Iran and Indonesia (Dehghani, 2021; Tayebi & Marefat, 2019). In his study on 44 Iranian EFL undergraduates, Dehghani (2021) investigated the role of learning styles on vocabulary learning. It was found out that the mean score for the visual group was the greatest, followed by multimodal learners. Tayebi and Marefat (2019) investigated vocabulary retention as well. The findings showed that visual learners outperformed auditory learners when exposed to vocabulary rote learning.

## 3. Methodology
### 3.1. Research Design

The current study utilized a quantitative methodology with an experimental research design. The experimental design allowed for the manipulation of independent variable ,i.e. learning style to examine its effects on the dependant variable, i.e. vocabulary learning and retention.
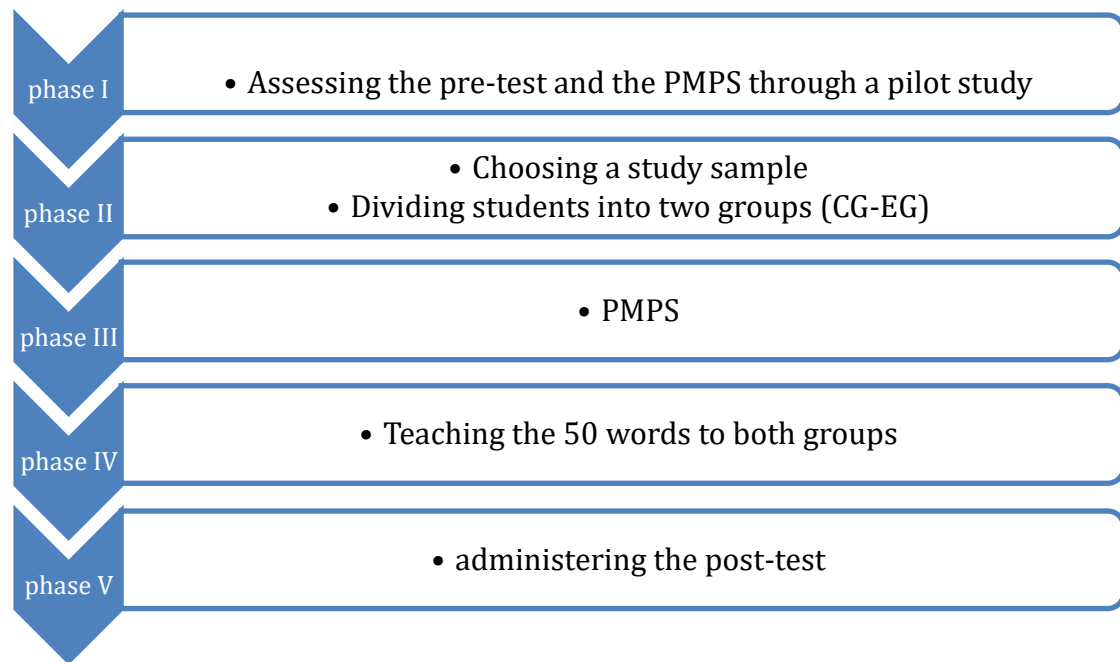
### 3.2. Participants

The study was conducted at Derna University. The target participants were 30 third-year English students since they make up the largest demographic compared to first, second or fourth- year students. Additionally, they are at a level where they are introduced to an advanced writing and speaking that necessitate extensive vocabulary knowledge. In order to reduce variability in the sample and increase the precision of the study, a homogeneous sampling strategy was utilized through a pre-test to ensure that all the participants are at the same level of vocabulary knowledge.

### 3.3. Data Collection Instruments and procedures

To investigate the research questions, three data collection tools were employed in this research study. First, a pre-test was taken from a book *Peterson's Master TOEFL Vocabulary* (Davy & Davy, 2006). The aim of this test was to ascertain the students' existing level of vocabulary proficiency prior to the initiation of the research investigation ( see appendix A). The second data collection instrument utilized in this study was the Perceptual Modality Preferences Survey ( PMPS) advanced by Cherry in 1981 as a part of his doctoral thesis work (Crannel, 2011). The questionnaire aimed to assess the ability to recall paired information across seven perceptual modalities: print, aural, interactive, visual, haptic, kinesthetic and olfactory (see appendix B). Subsequently, the teaching phase commenced with the presentation of 50 words to both groups taken from a book *504 Absolutely Essential Words* ( Bromberg et al., 2012) (see appendix C). The instructional sessions were structured around the gradual introduction of five words per lecture. The control group received instruction from their lecturer. The lecturer presented each word accompanied by its Arabic equivalent. The experimental group was taught by the researcher. To cater to the diverse learning styles within the experimental group, specific strategies were employed. Print students were provided with printed definitions of the words being taught. Visual students were presented with pictures on Whatsapp group. Lastly, the interactive group received instruction through interactive methods such as role plays, contextualization, and group discussions.

A post-test ( see appendix D) was employed at the end of the experiment to see if there was any significant differences between the two groups ( CG & EG). The data collection procedure is illustrated in figure 1 below:

```
┌──────────────────────────────────────────────────────────────────┐
│ phase I    • Assessing the pre-test and the PMPS through a pilot study │
├──────────────────────────────────────────────────────────────────┤
│ phase II   • Choosing a study sample                                 │
│              • Dividing students into two groups (CG-EG)             │
├──────────────────────────────────────────────────────────────────┤
│ phase III  • PMPS                                                    │
├──────────────────────────────────────────────────────────────────┤
│ phase IV   • Teaching the 50 words to both groups                    │
├──────────────────────────────────────────────────────────────────┤
│ phase V    • administering the post-test                             │
└──────────────────────────────────────────────────────────────────┘
```

## 4. Data Analysis

The collected data in this study was analyzed using the Statistical Package for the Social Sciences (SPSS) version 18, employing a range of statistical techniques to derive meaningful insights. Descriptive statistics were utilized to examine the results of the pre-test and the Perceptual Modality Preferences Survey (PMPS), providing a comprehensive overview of the participants' initial performance and their preferred learning styles. Furthermore, a t-test was employed to compare the test scores between the control group and the experimental group, allowing for a comparative analysis of the learning outcomes. Additionally, one-way ANOVA was utilized to compare the test scores among different subgroups within the experimental group, enabling a deeper exploration of the impact of varying learning styles on vocabulary retention.

### 4.1. Homogeneity of the Study Sample

Homogeneity sampling was employed in this study through the utilization of a pre-test to ensure a homogeneous sample of participants. As shown in Table 3, the results indicated that the mean score obtained was (13.46), with a standard deviation of (2.78). This demonstrates that the participants were at a similar level at the outset of the study.

**Table 3**: *Mean Scores of the Study Sample on the Pre-test*

|  | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Scores | 30 | 10.00 | 19.00 | 13.4667 | 2.78832 |
| Valid N (list wise) | 30 | | | | |

### 4.2. Perceptual Modality Analysis

The perceptual modality preferences survey yielded mean scores that shed light on the relative preferences for different perceptual modalities. Among the participants, the highest mean score of (12.9) was observed for the interactive modality, indicating a strong preference for engaging and participatory experiences. The visual modality received a mean score of (8.4), indicating a significant preference for visually stimulating content and imagery. The print modality garnered a mean score of (7.3), indicating a notable preference for traditional and tangible forms of information consumption, such as reading books or printed materials. Table 4 shows the students' most preferred learning styles.

**Table 4**: *Mean Scores of the PMPS for the Control and Experimental Groups*

|  | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Print | 30 | -17.00 | 31.00 | 7.3000 | 14.18875 |
| Aural | 30 | -30.00 | 21.00 | 1.6333 | 13.61663 |
| Interactive | 30 | -17.00 | 33.00 | 12.9667 | 12.53267 |
| Visual | 30 | -4.00 | 22.00 | 8.4333 | 7.45415 |
| Haptic | 30 | -22.00 | 19.00 | -4.6000 | 11.39147 |
| Kinesthetic | 30 | -18.00 | 19.00 | 1.9000 | 10.48595 |
| Olfactory | 30 | -36.00 | 4.00 | -19.2333 | 11.13764 |
| Valid N (list wise) | 30 |  |  |  |  |

### 4.3. post test analysis

After teaching a list of 50 words, a post-test was administered to both the control and experimental groups. To determine if there were significant differences between the two groups, a t-test was conducted to compare their mean scores. The results in table 5 revealed that the control group obtained a mean score of (26.66), while the experimental group achieved a slightly higher mean score of (27.40).

**Table 5**: *Mean Scores of the Experimental and Control Groups on the Post-test*

|  | Group | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Score | Control | 15 | 26.6667 | 9.54438 | 2.46435 |
|  | Experimental | 15 | 27.4000 | 8.95066 | 2.31105 |

The equality of variances between the two groups, as noted in table 5, was assessed using Levene's test. Levene's test is commonly employed to determine if the variances of two or more groups significantly differ from each other. Table 6 below presents the obtained significance level for this test which was ((sig= .797 > α= 0.05). Therefore, it can be concluded that there is no significant difference in variances between the two groups.

**Table 6**: *The Difference between Control and Experimental Groups on Post-test*

|  |  | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | F | Sig. | T | Df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
|  |  |  |  |  |  |  |  |  | Lower | Upper |
| Score | Equal variances assumed | .068 | .797 | -.217 | 28 | .830 | -.73333 | 3.37846 | -7.65379 | 6.18712 |
|  | Equal variances not assumed |  |  | -.217 | 27.885 | .830 | -.73333 | 3.37846 | -7.65507 | 6.18840 |

### 4.4. Learning Styles within the Experimental Group

Despite the absence of a significant difference between the control and experimental groups, it was imperative to conduct further analysis within the experimental group to explore variations in performance among subgroups of different perceptual modalities. To accomplish this analysis, one-way ANOVA was employed. As displayed in table7 , the obtained significance level for this analysis was ( sig= .315> α = 0.05) which indicates that there is no statistically significant difference in performance between the interactive, visual and print subgroups within the experimental group.

**Table 7**: *One-way ANOVA Results for the Subgroups*

|  | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 196.567 | 2 | 98.283 | 1.275 | .315 |
| Within Groups | 925.033 | 12 | 77.086 |  |  |
| Total | 1121.600 | 14 |  |  |  |

Based on the analysis of mean scores of each subgroup, the results revealed that the interactive subgroup obtained the highest mean score of (31.83), indicating superior performance. On the other hand, the visual subgroup achieved a mean score of (24.50), while the print subgroup had a slightly lower mean score of (24.40). These findings suggest that the interactive approach had a significant impact on the participants' performance, as it led to higher scores compared to the print and visual methods. The mean scores are shown in table 8 below:

**Table 8**: *The Mean Scores of the Three Subgroups*

|  | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|
|  |  |  |  | Lower Bound | Upper Bound |  |  |
| Print | 24.4000 | 8.61974 | 3.85487 | 13.6972 | 35.1028 | 15.00 | 38.00 |
| Interactive | 31.8333 | 8.56543 | 3.49682 | 22.8445 | 40.8222 | 19.00 | 39.00 |
| Visual | 24.5000 | 9.32738 | 4.66369 | 9.6581 | 39.3419 | 15.00 | 33.00 |
| Total | 27.4000 | 8.95066 | 2.31105 | 22.4433 | 32.3567 | 15.00 | 39.00 |

## 4.5. Discussion

The outcomes revealed that there was no significant difference between the control group which received traditional teaching and the experimental group which was instructed based on interactive, print and visual learning styles. The similarity in scores suggests that the different learning styles employed in the experimental group did not lead to significantly better vocabulary retention compared to the traditional teaching approach used with the control group. One possible explanation for this similarity in learning outcomes is that the instructional methods (clarified previously in the data collection procedure section) used in both groups were equally effective in facilitating vocabulary learning. It is plausible that the material or teaching practices employed in both the control and experimental groups were sufficiently engaging, comprehensive, and aligned with the learners' needs, resulting in comparable outcomes. Second, both groups may have had students who were intrinsically motivated and engaged in the learning process, regardless of the specific instructional approach. Interestingly, both the researcher who taught the experimental group and the lecturer responsible for teaching the control group expressed positive feedback regarding the students' engagement and learning during the sessions. The students demonstrated a strong interest for the instructional material and expressed satisfaction with their learning experience. Moreover, the lecturer reported that the students conveyed a desire for the sessions to be continued throughout their academic journey, indicating a perceived value and effectiveness of the teaching method employed.

The findings of the current study are in harmony with Sabag and Trotskovsky (2014) who conducted a comprehensive study to investigate the influence of matching instructional strategies with individual learning styles on students' academic achievement. The findings did not provide substantial evidence to support the widely held notion that a strong alignment between learning styles and instructional strategies significantly affects students' academic achievement.

In contrast to the aforementioned study, other studies reported conflicting results in terms of the relationship between learning styles and learning outcomes. In their study on 310 English Major students and four lecturers from the Foreign Languages Faculty of Azad University, Naimie et al. (2010) explored the impact of matching and mismatching teaching and learning styles preferences on students' achievement. According to their findings, the correspondence between teaching and learning styles substantially enhanced students' achievement. Notably, the interactive students achieved the highest mean score among the different learning style subgroups, surpassing both print and visual learners. These findings, in contrast, present a deviation from the results obtained in a study conducted by Dehghani (2021) on a sample of 44 Iranian EFL undergraduates. Dehghani aimed to investigate the impact of learning styles on vocabulary retention. Remarkably, Dehghani's study yielded different findings, as the visual group exhibited the highest mean score in terms of vocabulary retention.

All in all, it is crucial to recognize the significant impact of teachers' beliefs and practices on students' vocabulary learning experiences. In Libyan universities, the absence of a structured vocabulary teaching curriculum leads teachers to prioritize delivering the required course content. Consequently, the process of acquiring vocabulary becomes challenging and time-consuming, requiring substantial effort from students themselves. Nation (2013, as cited in Bergstrom et al., 2022) highlights the importance of adopting a deliberate and organized approach to vocabulary instruction in the classroom, with vocabulary as the central focus. The present study found that when participants received explicit vocabulary instruction, whether through traditional teaching methods or catered to their preferred learning styles, they were adaptable and motivated towards vocabulary learning.

## 5. Conclusion

Derived from the data analyzed in the previous section, the following findings were reached to answer the three research questions:
1.  What are the perceptual learning styles preferred by third-year EFL learners at the university of Derna?
2.  To what extent does the alignment of teaching methods with perceptual learning styles impact vocabulary retention outcomes?
3.  What is the most effective learning style with respect to vocabulary retention?

To address the first research question, the findings of the descriptive statistics showed that among seven perceptual learning styles, i.e. print, aural, interactive, visual, haptic, kinesthetic and olfactory, the interactive learning style was the most preferred by third-year EFL learners at Derna University followed by visual and print styles. In relation to the second research question, the findings revealed that the alignment of teaching methods with the students' perceptual learning styles did not significantly impact their vocabulary retention outcomes compared to the traditional teaching methods.

Lastly, with regards to the third research question, the study found that the participants of interactive learning style achieved a higher mean score than those of visual and print learning styles. However, the study also demonstrated that the performance between the three subgroups of learning styles was not statistically different.

### 5.1. Implications for Education

Vocabulary traditional teaching was equally effective as learning style-based teaching . This suggests that educators should integrate the teaching of vocabulary, and pay attention to individual differences without relying solely on planning instruction based on students' learning styles. One more implication of this study is incorporating interactive activities in vocabulary teaching, as illustrated by the higher mean score obtained by students with interactive learning style, can be useful for vocabulary retention. While the study did not demonstrate a statistically significant difference between the interactive, print and visual students, it is important for educators to be aware that students may benefit from exposure to various modalities.

### 5.2. Recommendations for Further Research

1.  Only the impact of learning styles on vocabulary retention was investigated in this study. It is recommended that further studies examine other factors which may contribute to vocabulary retention.
2.  This study was conducted on EFL students at Derna University. It would provide greater motivation to examine other contexts to see whether the same conclusions would be arrived at.
3.  Further experimental studies on the impact of learning styles on vocabulary retention need to consider expanding vocabulary instruction by including a larger set of words as this may lead to more comprehensive outcomes regarding the effectiveness of learning styles.

**Compliance with ethical standards**
*Disclosure of conflict of interest*
The author(s) declare that they have no conflict of interest.

## References

Al-Janash, B. T. (2018). Perceptual learning styles preferences of EFL students. *Sabratha University Scientific Journal*, *2*(2), 47-28. https://doi.org/10.47891/sabujhs.v2i2.84

Al-Zayed, N. N. Y. (2017). An investigation of learning style preferences on the students' academic achievements of English. *International Journal of English Linguistics*, *7*(5), 176-183. http://doi.org/**10.5539/ijel.v7n5p176**

Bergström, D., Norberg, C., & Nordlund, M. (2022). "Words are picked up along the way"–Swedish EFL teachers' conceptualizations of vocabulary knowledge and learning. *Language Awareness*, *31*(4), 393-409. http:// doi.org/10.1080/09658416.2021.1893326

Brahmakasikara, L. (2013). Learning styles and academic achievement of English III students at Assumption University of Thailand. *ABAC Journal*, *33*(3). http://www.assumptionjournal.au.edu/index.php/abacjournal/article/view/95

Bromberg, M., Liebb, J., &Traiger,A. (2012). *504 Absolutely Essential Words*. Simon and Schuster. http://dl8.irlanguage.com/Coding-504//504Absolutely%20Essential%20Words-6th.pdf

Cherry, C. E. (1981). *The measurement of adult learning styles: Perceptual modality*. (Unpublished doctoral dissertation). University of Tennessee, Knoxville.

Cornett, C. E. (1983). *What you should know about teaching and learning styles.* Phi Delta Kappa Educational Foundation, Bloomington, Indiana.

Crannell, B. (2011). *A study of the relationship between the preferred area of clinical practice of registered nurses and their learning style modality preference* (Published doctoral dissertation). Auburn University. Auburn, Alabama

Davy, E., & Davy, K. (2006). *Peterson's master TOEFL vocabulary*. USA: Petersons Company.

Dehghani, A. P. (2021). Learning styles and vocabulary learning by Iranian undergraduate EFL learners. *Contemporary Educational Research Journal*, *11*(4), 176-185. https://doi.org/10.18844/cerj.v11i4.5723

Dunn, R. (1988). Commentary: Teaching students through their perceptual strengths or preferences. *Journal of Reading*, *31*(4), 304-309. http://www.jstor.org/stable/40031890

Dunn, R., & Dunn, K. (1974). Learning style as a criterion for placement in alternative programs. *The Phi Delta Kappan*, *56*(4), 275-278. https://www.jstor.org/stable/20297890

Dunn, R., Beaudry, J. S., & Klavas, A. (1989). Survey of research on learning styles. *Educational Leadership*, *46*(6), 50-58.

Ehrman, M. E. (1996). *Understanding second language learning difficulties*. Sage. https://doi.org/10.4135/9781452243436

Fleming, N. D. (1995, July). I'm different; not dumb. Modes of presentation (VARK) in the tertiary classroom. In *Research and Development in Higher Education, Proceedings of the 1995 Annual Conference of the Higher Education and Research Development Society of Australasia (HERDSA), HERDSA* (Vol. 18, pp. 308-313).

Ghwela,M., Mustaffa,R., & Noor,N. (2017). Perceptual learning style preferences of EFL Libyan university learners. *International Journal of Social Science and Humanities Research*, *5*(2), 409-416. https://www.researchpublish.com/upload/book/Perceptual%20Learning%20Style%20Preferences-4557.pdf

Hamed, M., & Almabruk, A. (2021). Perceptual learning style preferences of English major Libyan university students and their correlations with academic achievement. *Advances in Language and Literary Studies*, *12*(5), 1-5. https://files.eric.ed.gov/fulltext/EJ1335613.pdf

Herizal, H. (2018). The Relationship among learning styles, classroom environment, and academic achievement of English education study program students in state Islamic university of Raden Fatah Palembang. *Ta'dib: Jurnal Pendidikan Islam*, *23*(1), 34-43. https://doi.org/10.19109/td.v23i1.1967

Hidayah, N., Rofiqoh, R., Dewi, A. K., & Suriaman, A. (2022). Correlation between learning styles and academic achievement. *Jurnal Pendidikan, Sains Sosial, dan Agama*, *8*(2), 548-557. https://doi.org/10.53565/pssa.v8i2.534

Keefe, J. W. (1985). Assessment of learning style variables: The NASSP task force model. *Theory into Practice*, *24*(2), 138-144. https://doi.org/10.1080/00405848509543162

Kirschner, P. A., & van Merriënboer, J. J. (2013). Do learners really know best? Urban legends in education. *Educational Psychologist*, *48*(3), 169-183. https://doi.org/ 10.1080/00461520.2013.804395

Naimie, Z., Siraj, S., Piaw, C. Y., Shagholi, R., & Abuzaid, R. A. (2010). Do you think your match is made in heaven? Teaching styles/learning styles match and mismatch revisited. *Procedia-Social and Behavioral Sciences*, *2*(2), 349-353

**1181 | (AJASHSS):**

Nation, I.S.P. (2001). *Learning vocabulary in another language* (Vol.10). Cambridge: Cambridge university press

Oksattridywi, M. (2017). A correlation of learning styles and vocabulary achievement. *Jurnal Pendidikan dan Pembelajaran Khatulistiwa (JPPK)*, *6*(10).https://jurnal.untan.ac.id/index.php/jpdpb/article/view/22288/17774

Oxford, R. L. (2003). *Language learning styles and strategies*: *An overview*. Mouton de Gruyter. https://web.ntpu.edu.tw/~language/workshop/read2.pdf

Oxford, R. L., Ehrman, M. E., & Lavine, R. Z. (1990). Style wars: Teacher-student style conflicts in the language classroom. Heinle & Heinle Publishers

Padidar, H. A., Tayebi, G., & Shakarami, A. (2015). The relationship between learning styles and vocabulary learning and retention. *Spectrum*, *4*(1). https://www.academia.edu/10557414/The_Relationship_between_Learning_Styles_and_Vocabulary_Learning_and_Retention

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. Psychological Science in the Public Interest, 9(3), 105-119. https://doi.org/10.1111/j.1539-6053.2009.01038.x

Rossi-Le, L. A. (1989). *Perceptual learning style preferences and their relationship to language learning strategies in adult students of English as a second language*. (Published doctoral dissertation). Drake University. https://core.ac.uk/download/pdf/46924458.pdf

Sabag, N., & Trotskovsky, E. (2014). Matching instructional strategies to learning styles: Does it contribute to students' achievements?. In *ICEE/ICIT 2014, Joint International Conference on Engineering Education & International Conference on Information Technology* (pp. 134-142)

Tayebi, G., & Marefat, S. (2019). The impact of rote learning on vocabulary learning: The case of Iranian EFL learners with visual and auditory learning styles. *Journal of Studies in Learning and Teaching English*, *8*(1), 129-145. https://jslte.shiraz.iau.ir/article_684621.html

Wilkins, D. A. (1972). *Linguistics in language teaching* (Vol. 111). London: Edward Arnold.

Willingham, D. T. (2018). Ask the cognitive scientist: Does tailoring instruction to learning styles help students learn?. *American Educator*, *42*(2), 28.