



**12th ASIAN Conference on Environment-Behaviour Studies,
Holiday Villa Beach Resort & Spa, Langkawi Island, Malaysia, 01-03 Mar 2024**

Learning Style and English Argumentative Writing Proficiency: How they complement each other?

Tian Jie¹, Ng Soo Boon²

¹Tangshan Vocational & Technical College, China

²SEGi University, Malaysia

1426835162@qq.com. ngsooboan@segi.edu.my
Tel: 86-13933170757

Abstract

Argumentative writing in a foreign language is challenging for non-native speakers. The study was conducted in a China Normal University with 356 English major participants to uncover whether specific Learning Style (Converging, Diverging, Assimilating, Accommodating) has a higher significant impact on English Argumentative Writing Proficiency (EAWP). This study employed an explanatory sequential mixed-method research design. Findings showed that Convergers obtained the highest mean score in EAWP, while Divergers gained the lowest. The interviews revealed that students with different LS generally underwent four similar writing procedures. However, they differ concerning the strategies they employ in the writing process.

Keywords: Learning Style; English Argumentative Writing Proficiency; Mixed-method Research Design; Teaching Strategies

eISSN: 2398-4287 © 2024. The Authors. Published for AMER & cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Peer-review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.

DOI: <https://doi.org/10.21834/e-bpj.v9i28.5909>

1.0 Introduction

English as Foreign Language (EFL) learners regard writing, especially argumentative writing, as one of the most challenging skills to become proficient in (Ferretti & Graham, 2019; Jabali, 2018). Therefore, scholars from China and other countries invested much effort in helping EFL learners become more proficient argumentative writers in English.

1.1 Statement of the Problem

Argumentative writing has been identified as a necessity for modern-day professionals, culminating in much research related to EFL students' readiness in argumentative writing (Ferretti & De La Paz, 2011). In preparation for careers after graduation, at the undergraduate and postgraduate level, students must complete an argumentative writing assignment in English for high-stakes international tests like the GRE (Graduate Record Examination), IELTS (International English Language Testing System), and TOEFL (Test of English as a Foreign Language). In recent years, English Argumentative Writing Proficiency (EAWP) among students was evaluated using the TEM4 writing task in China. Meng (2022) reported that the average score of the students in the writing section of the TEM4 was less than seven, which is below the passing mark. Yang (2021) also attested to English major students' poor argumentative writing performance. In the TEM4 writing section, they only received a mean score of six (Zhao & Wei, 2022). Chinese university students' poor English argumentative writing performance was deemed detrimental to improving the English language (Zhao

eISSN: 2398-4287 © 2024. The Authors. Published for AMER & cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Peer-review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: <https://doi.org/10.21834/e-bpj.v9i28.5909>

& Yang, 2022). As a result, universities must foster and enhance their students' EAWP. Therefore, this study investigated how the LS impacts the EAWP among English major sophomores.

1.2 Role of Learning Style

"Learning Style" (LS) describes students' different learning strategies. There have been conflicting previous studies on the relationship between learning outcomes and LS (Layco et al., 2022; Nurhayati & Penna, 2023) While some researchers (Cisneros et al., 2022; Nurhayati & Penna, 2023) revealed a favourable association between LS and learning outcomes, others suggested a negative (Shirazi & Heidari, 2019) or insignificant (Magulod, 2019) relationship between the two variables. Regarding language acquisition, Dong et al. (2019) have demonstrated the importance of LS in EFL learning. There are conflicting results regarding whether LS affect learners' English language competency (Cheng & Guan, 2015).

1.3 Research Objectives and Questions

The mixed findings on the relationship between LS and academic performance, especially on language learning, deserve attention in research. Hence, this study focused on the following three Research Objectives:

RO1 to investigate the types of Learning Styles and the English Argumentative Writing Proficiency level among the students.

RO2 to examine whether there is a statistically significant difference in English Argumentative Writing Proficiency among students based on Learning Styles.

RO3 to explore what are the processes and strategies the students employ to deal with their English argumentative writing.

Accordingly, four research questions were presented as follows:

RQ1: What are the types of Learning Styles among the students?

RQ2: What is the English Argumentative Writing Proficiency level among the students?

RQ3: Is there a statistically significant difference in English Argumentative Writing Proficiency among students based on Learning Styles

RQ4: What are the processes and strategies the students employ to deal with their English argumentative writing?

2.0 Literature Review

Learners' learning styles determine the tactics they choose to employ and, consequently, influence their learning outcomes (Feng et al., 2020; Widharyanto & Binawan, 2020). Rahman et al. (2016) specifically reiterated that a learner's unique LS can affect their academic performance.

2.1 Definition of Learning Style

Although LS has been described in various ways, all definitions agree that LS is crucial in determining how different people learn efficiently. Kennedy (2002) defined learning as a process "to cultivate oneself as an intelligent, creative, independent, autonomous being" (p. 433). Individuals use specific styles when we think and learn" (Cano-Garcia & Hughes, 2000, p. 414). These individuals' preferences lead to their differences in LS. Kolb (2014) defined LS as individuals' preferred modality to grasp and transfer information, which is adopted in this study. Kolb further reiterated that teachers and students need to know their LS as learning is "the process in which knowledge is created through the transformation of experiences" (Kolb, 2014, p. 38) and "knowledge results from the combination of grasping and transforming experience" (Kolb, 2014, p. 41). By reflecting on their learning experiences, students learn better and would not repeatedly make the same mistakes in the learning process.

2.2 Kolb's Experiential Learning Theory

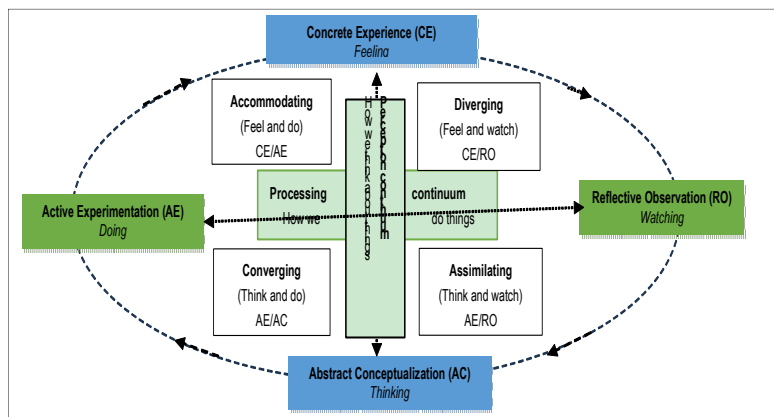


Figure 1 Kolb's Experiential Learning Cycle

Kolb proposed the Experiential Learning Theory (ELT) based on understanding the learning process and experience construction. According to Morris (2020), Kolb's ELT is a highly regarded and well-received learning theory in higher education. Kolb's ELT outlines the four Learning Modes (LM) of grasping and transferring experience: Active Experimentation (AE), Reflective Observation (RO), Concrete Experience (CE), and Abstract Conceptualization (AC), as illustrated in Figure 1. According to Kolb (2014), individuals grasp experience through CE or AC but transform experience through RO or AE. In an experiential learning cycle, students "touch all the bases" by responding to various learning situations by recursively experiencing, reflecting, thinking, and acting. Concrete Experience (CE) provides material for the Reflective Observation (RO), from which Abstract Concepts (AC) are distilled. Afterwards, the implication of abstract concepts is practiced through Active Experimentation (AE) under new circumstances.

2.3 Types of Learning Style

Kolb (2004) considered that learners have their strengths in the learning cycle, which are the basis of the preferred LS. Accordingly, LS is divided into four types: Diverging, Assimilating, Converging and Accommodating, which can be explained as follows:

- Diverging: Learners combine Concrete Experience (CE) and Reflective Observation (RO). Divergers are defined by their ability to absorb concrete events and reflect deeply on what they have learned (Kolb & Kolb, 2005).
- Assimilating: Learners are the embodiment of Abstract Conceptualization (AC) and Reflective Observation (RO). Assimilators are less interested in collaborative projects and favor abstract ideas over concrete specifics. (Kolb & Kolb, 2017).
- Converging: Learners are in favor of Abstract Conceptualization (AC) and Active Experimentation (AE). Convergers frequently apply the ideas they have learned in lectures by engaging in logical reasoning (Kolb & Kolb, 2017).
- Accommodating: Learners tend to combine Concrete Experience (CE) and Active Experimentation (AE), getting involved in activities and conducting creative and challenging experiences (Kolb & Kolb, 2017). Accommodators are typically hands-on practitioners who tend to do rather than think (Morris, 2020).

3.0 Methodology

The explanatory sequential mixed methods research design was used in this study to answer the Research Questions.

3.1 Research Procedure

Initially, the quantitative phase was carried out to ascertain the sample students' LS types and EAWP levels. Kolb's Learning Style Inventory (KLSI) version 3.1 was distributed to English major sophomores. Two essays were distributed to the students separately to evaluate their EAWP. Sample students had to complete two essays with a word limit of at least 200 that were taken from TEM4 (Test for English Majors Band 4). The Chinese Ministry of Education's TEM4 rubrics were used to score the essays. The students' EAWP was then determined by calculating the mean score of the two essays. Face-to-face focus group interviews were conducted to carry out the qualitative phase. The researcher then explored the students' writing procedures and strategies to produce English argumentative essays.

3.2 Sample and Setting

The study's target population was sophomores majoring in English Education at HH University in Hebei province, China. Seven intact classes were selected randomly from the ten classes. A total of 362 students participated in the quantitative section. After data screening, 356 valid items were entered into the data analysis. Optimal sampling was used to determine the respondents for interviews. A total of 12 students were selected purposefully to form four groups, representing Divergers, Convergers, Assimilators and Accommodators, respectively.

4.0 Findings

This section targeted the research's findings, answering the Research Questions.

4.1 Types of LS

This section answered RQ1: What are the types of Learning Styles (LS) among the students? With the calculation of LM from each respondent, each student's preferred LS was ascertained according to a formula designed in Kolb's (2014) Learning Style Grid. Table 1 illustrates the respondents' LS as follows:

Table 1 Descriptive statistics of LS among respondents (n=356)

LS	Frequency	Per cent (%)
Accommodating	46	12.9
Diverging	158	44.4
Converging	63	17.7
Assimilating	89	25.0

The dominant LS among respondents was Diverging, accounting for 44.4% (n=158), while the least preferred LS was Accommodating, at 12.9% (n=46) and converging and Assimilating accounts for 17.7% (n=63) and 25.0% (n=89) of respondents, respectively.

4.2 Level of EAWP

This section answered RQ2: "What is the level of English Argumentative Writing Proficiency (EAWP) among the students?" Accordingly, the respondents' EAWP were examined through their achievement on writing tasks excerpted from TEM4 (Test for English Majors Band Four). Table 2 illustrates the respondents' mean score in terms of EAWP.

Table 2 Distribution of means and standard deviations of respondents' EAWP(n=356)

Item	Mean	SD
Writing 1	10.58	2.209
Writing 2	12.79	2.831
EAWP	11.685	2.327

Table 1 showed that Writing 1 had a mean score of 10.58 (SD=2.209) while Writing 2 had a significantly higher mean score (M=12.79, SD=2.831). As a result, the respondents' EAWP mean score was 11.685 (SD=2.327), which is low.

4.3 Difference of EAWP Based on LS

RQ3 investigated whether there was a statistically significant difference in EAWP among students based on LS. Table 3 shows that Converging LS respondents have the highest mean score in the EAWP (M=12.556, SD=2.185), whereas Diverging LS respondents have the lowest mean score (M=11.016, SD=2.170). About EAWP, Accommodating LS and Assimilating LS had mean scores of 11.772 (SD=2.687) and 12.213 (SD=2.182), respectively.

Table 3 Mean and standard deviation of EAWP based on ls (n=356)

Learning Style	N	Mean	SD
Accommodating	46	11.772	2.687
Diverging	158	11.016	2.170
Converging	63	12.556	2.185
Assimilating	89	12.213	2.182

Table 4 displayed the outcomes of a one-way ANOVA that was performed for a more thorough examination. It revealed that responders with varying LS (Diverging, Converging, Assimilating, and Accommodating) have statistically significant differences in their EAWP: $p = .000 < 0.05$, $F(3,352) = 9.477$.

Table 4 ANOVA of EAWP based on LS.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	143.701	3	47.900	9.477	0.000***
Within Groups	1779.063	352	5.054		

Note, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A post-hoc comparison using the Turkey HSD test examined the differences between diverging, convergent, assimilating, and accommodating LS with EAWP. Table 5 displays the outcome. Statistically, respondents with Diverging LS were significantly different in EAWP from those with Converging LS ($p = 0.000 < 0.05$) and Assimilating LS ($p = 0.000 < 0.05$). Nevertheless, there was no statistically significant difference ($p = 0.187 > 0.05$) in EAWP between respondents with Diverging LS and those with Accommodating LS.

Table 5 Turkey HSD Post-hoc analysis of mean score of EAWP based on LS (n=356)

I) LS	(J) LS	Mean Difference (I-J)	Std. Error	Sig.
Accommodating	Diverging	0.7559	0.3766	0.187
	Converging	-0.7838	0.4360	0.276
	Assimilating	-0.4417	0.4082	0.701
Diverging	Accommodating	-0.7559	0.3766	0.187
	Converging	-1.5397*	0.3350	0.000***
	Assimilating	-1.1977*	0.2980	0.000***
Converging	Accommodating	0.7838	0.4360	0.276
	Diverging	1.5397*	0.3350	0.000***
	Assimilating	0.3421	0.3702	0.792
Assimilating	Accommodating	0.4417	0.4082	0.701
	Diverging	1.1977*	0.2980	0.000***
	Converging	-0.3421	0.3702	0.792

Note, ***The mean difference is significant at the 0.001 level.

In conclusion, the respondents' LS impacted their EAWP. Regarding EAWP scores, respondents with convergent LS outperformed those with accommodating, assimilating, and diverging LS.

4.4 The Difference in English Writing Process among Respondents of Different LS

Respondents in the four groups were labelled from R1 to R12. Through focus group interviews, it was found that they underwent similar procedures dealing with argumentative essay writing, namely passage-examining, planning, implementation and revising. However, they differed concerning some strategies they employed during the writing process, as shown in the sessions below.

4.4.1 Accommodating

Accommodators tended to practice, take the initiative and be adaptable. The respondents suggested various practice techniques when asked how they acquired vocabulary and grammar. The three Accommodators interviewed affirmed that they preferred an experiential, hands-on approach to learning, reflecting their nature as risk-takers and self-reflective. They tended to take the initiative to accomplish their goals, as shown in the quote by R3.

When I was in high school, although the teacher did not have much time to read my composition, I took the initiative to invite the teacher to give suggestions on my writing. The teacher can find my problem directly, and the teacher's comments are more convincing. (R3)

Another feature shown by Accommodators was their willingness to adapt and learn from new experiences. R2 talked about their experience picking up vocabulary.

I used multiple approaches to learn vocabulary; I used to recite the words by copying them on a piece of paper. Nowadays, with the popularity of cellphones, I download the App to learn words. Besides, I also learned vocabulary through reading. Any approach is fine for me. It depends. (R1)

4.4.2 Diverging

Diverging students favour brainstorming and are open-minded to new things. The three respondents interviewed discussed their experiences, such as the following, when asked about the essay writing process:

I like to collect all kinds of information because I'm afraid I'm not good enough, so I want to absorb other people's opinions and ideas and synthesize them to get my ideas. (R4)

Brainstorming may foster teamwork, creative thinking, and the development of the ideal concept for the group. Divergers' experiences with learning language and gathering evidence also showed their preference for group brainstorming. For instance:

When we hold divergent views about an exercise, I am accustomed to discussing it with my classmates. Sometimes, I convinced them; Sometimes, they convinced me. We just showed our opinion about it and endeavoured to find out the correct answer. I enjoy the discussion. (R6)

4.4.3 Converging

The three Converging respondents demonstrated their inclination to be logical in essay writing. For instance:

It is logic. For example, a topic needs to be discussed from a less significant level to a more significant level, and connective links between sentences need to be made. (R7)

The inclination to be reasoning can also be discerned from the interviewees' experience of vocabulary and grammar learning, as shown below:

For example, the word "discourage" is composed of DIS and COURAGE. When I know that DIS has a negative meaning and the meaning of COURAGE. Then, I can guess the meaning of this word. Anyway, I would not say I like to memorize the word by rote. It's too boring. What I prefer is the skilful way. (R7)

Additionally, being capable problem solvers can be discerned from the interviewees' illustrations of the writing procedure. For instance:

I prefer to collect extensive information and reflect on it to obtain my point of view. (R9)

4.4.4 Assimilating

Assimilating students are more interested in ideas and abstract concepts. The interview transcripts reveal their preference for analytical models and planning. Among those with Assimilating LS, creating models was common. For instance,

I pay less attention to people and am interested in abstract ideas and concepts, from which I can summarize how I deal with them [writing]. (R9)

Interviewees also preferred planning with Assimilating LS when dealing with vocabulary learning. Cases in point were as follows:

I am in favour of reciting words on my schedule. When using the App to learn words, such as Bai Cizhan or Momo, I always set a word limit, say 50 words per day. In this way, I am confident that I can achieve my purpose in the end. (R 11)

5.0 Discussion

Diverging LS predominated among the sample students in this study; this has also occurred to students in other research. Shirazi and Heidari (2019) found that Diverging LS dominated 360 language learners at an Iranian university. In another study, Aliakbari and Qasemi (2012) examined the LS of 327 EFL English learners in Iran and also found that most of the sample students have Diverging and Assimilating LS. LS preference has been considered discipline-specific (Kolb & Kolb, 2017), and particular contextual requirements of educational specialization influenced LS preference. Converging LS is preferred by individuals focusing on medicine and engineering, whereas Diverging LS is preferred by those majoring in political science, history, the arts, psychology, and English. While those with Accommodating LS typically major in education, communication, or nursing, those with Assimilating LS are likelier to work in the physical and mathematical sciences. According to Shirazi and Heidari (2019), the preferred learning styles of various disciplines vary due to variations in educational contexts or methodologies. It is rather surprising that respondents in this study who are EFL students training to be teachers did not conform to the norm of Accommodating LS but instead showed a preference similar to other English majors.

Convergers (M=12.556) have the highest mean score in the EAWP in this study, followed by Assimilators (M=12.213), Accommodators (M=11.772), and Divergers (M=11.016). Jilardi Damavandi et al. (2011) also found that Convergers and Assimilators outperformed Divergers and Accommodators in academic achievement, and the difference was statistically significant. Wu (2015) examined the English writing proficiency of eighty sophomore English majors at Qingdao University in China and discovered that Convergers had higher scores than the rest. The same is true when similar studies were carried out on English major students at Libyan universities (Hamed & Almabruk, 2021). Thus, the findings of this study conformed with other studies.

The findings from this study revealed that the respondents adhered to the four-phase procedure during writing: passage-examining, planning, implementation and revising. Overall, the process aligns with the proposition put forth by Flowers and Hayes (1981), who suggested that the cognitive writing process involves three stages: planning, translating, and revising. But before the planning phase of this investigation, there is a passage-examining phase. This comes from the TEM4 authoring task's source-based design. Examining and reacting to the source text is how the source-based writing activity is carried out (Dong & Shi, 2021; Weston-Sementelli, 2018). Interviewees with different LS did not differ much in the writing process. However, they employed various strategies in essay writing. The traits of their different LS explained their difference. According to Kolb (2014), Divergers are best at viewing concrete situations from many other points of view. Their approach to situations is to observe rather than take action. Assimilators are best at understanding a wide range of information and putting it into concise, logical form. Convergers are best at finding practical uses for ideas and theories. Accommodators can learn primarily from hands-on experience.

6.0 Conclusion & Recommendations

In conclusion, Diverging LS is the predominant learning style among HH University sophomore English major students. LS and EAWP were found to be significantly correlated. Convergers and Assimilators are more likely to succeed in EAWP among the different LS. This explains why the EAWP score of the respondents in this study is relatively low. Respondents with different LS tend to use different writing strategies, although their writing procedures were about the same.

The findings of this study yielded productive feedback to EFL teachers. Although EFL teachers may not be able to accommodate each student's learning style, they can create courses and employ a wide range of instructions to ensure that students have a pleasant and gratifying experience in the hope of a rewarding outcome. It would be suitable for students to be aware of their preferred LS and identify their corresponding weaknesses in learning English writing. Subsequently, teachers should try to adjust and develop their learning strategies to overcome weaknesses or deficiencies based on their preferred LS (Kolb, 2005; Kolb & Kolb, 2017). Using general strategies such as computer-based simulation exercises, scenario planning, debating, and projects offers opportunities to develop students with different LS.

In future, it is suggested to investigate in depth how the LS defined by the other scholars impacts the EAWP. The limitation of the study lies in its generalization. Since the participants were confined to the English major sophomores, and the setting was a normal university in China, the findings cannot be generalized to other students and universities.

Paper Contribution to Related Field of Study

This study offers theoretical and practical insights for EFL students, teachers, and curriculum designers. It provides information to help decision-makers in China improve EFL university students' English argumentative writing proficiency. The current study offered a significant attempt to reveal the characteristics of EFL English argumentative essays and the factors influencing them.

References

- Aliakbari, M., & Qasemi, N. (2012). On the relationship between Iranian EFL learners' learning style preference and their gender, proficiency level and achievement score. *International Journal of Pedagogies and Learning*, 7(3), 275-283.
- Cano-García, F., & Hughes, E. H. (2000). Learning and thinking styles: An analysis of their interrelationship and influence on academic achievement. *Educational Psychology*, 20(4), 413-430.

- Cheng, H. Y., & Guan, S. Y. (2015). Unravelling the influence of cognitive style on Chinese students' classroom behaviors: the mediating effects of the structure-oriented/depth-oriented learning approach. *Educational Psychology*, 35(4), 497-512.
- Cisneros, A. M. M., Quiñones, M. A. B., & Benavides, J. A. H. (2022). VAK Learning Styles and Study Habits to improve academic performance. *Synergia's Educations*, 7(2).
- Dong, Y., & Shi, L. (2021). Using Grammarly to support students' source-based writing practices. *Assessing Writing*, 50, 100564.
- Dong, Y., Wu, S. X., Wang, W., & Peng, S. (2019). Is the student-centered learning style more effective than the teacher-student double-centered learning style in improving reading performance? *Frontiers in Psychology*, 10, 2630.
- Feng, Y., Iriarte, F., & Valencia, J. (2020). Relationship between learning styles, learning strategies and academic performance of Chinese students who learn Spanish as a foreign language. *The Asia-Pacific Education Researcher*, 29, 431-440.
- Ferretti, R. P., & De La Paz, S. (2011). On the comprehension and production of written texts: Instructional activities that support content-area literacy. *Handbook of reading interventions*, 326-355.
- Ferretti, R. P., & Graham, S. (2019). Argumentative writing: Theory, assessment, and instruction. *Reading and Writing*, 32, 1345-1357.
- 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.
- Jabali, O. (2018). Students' attitudes towards EFL university writing: A case study at An-Najah National University, Palestine. *Heliyon*, 4(11), e00896.
- Jilardi Damavandi, A., Mahyuddin, R., Elias, H., Daud, S. M., & Shabani, J. (2011). Academic achievement of students with different learning styles. *International Journal of Psychological Studies*, 3(2), 186-192.
- Kennedy, P. (2002). Learning cultures and learning styles: Myth-understandings about adult (Hong Kong) Chinese learners. *International Journal of Lifelong Education*, 21(5), 430-445.
- Kolb, A. Y., & Kolb, D. A. (2017). Experiential learning theory as a guide for experiential educators in higher education. *Experiential Learning & Teaching in Higher Education*, 1(1), 7-44.
- Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT press.
- Layco, E. P., Manatees, R. P., & Villanueva, L. F. S. (2022). Learning style preferences, academic satisfaction, and performance in online distance learning in tertiary education under the new normal. *International Journal of Early Childhood Special Education*, 14(3).
- Magulod Jr, G. C. (2019). Learning styles, study habits and academic performance of Filipino University students in applied science courses: Implications for instruction. *JOTSE: Journal of Technology and Science Education*, 9(2), 184-198.
- Manee, F., Nadar, M., & Jahrami, H. (2013). Learning styles of allied health sciences students at Kuwait University. *International Journal of Therapy and Rehabilitation*, 20(5), 255-259.
- Meng, C. (2022). How to improve the pass rate of CET4/6 in public English teaching under the background of "high-level penetration"—Taking "Occupational Comprehensive English" as an example. *Science and Education Wenhui* (01), 78-81. doi:10.16871/j.cnki.kjwha.2022.01.021.
- Morris, T. H. (2020). Experiential learning—a systematic review and revision of Kolb's model. *Interactive learning environments*, 28(8), 1064-1077.
- Nurhayati, N., & Penna, H. T. D. (2023). The Correlation between Students Learning Styles and Their English Academic Achievement. *SUMIKOLAH: Jurnal Ilmu Pendidikan*, 1(1), 39-48.
- Rahman, A., Ahmar, A., & Rusli, R. (2016). The influence of cooperative learning models on learning outcomes based on students' learning styles. *World Transactions on Engineering and Technology Education*, 14(3).
- Shirazi, F., & Heidari, S. (2019). The relationship between critical thinking skills and learning styles and academic achievement of nursing students. *The Journal of Nursing Research*, 27(4), e38.
- Weston-Sementelli, J. L., Allen, L. K., & McNamara, D. S. (2018). Comprehension and writing strategy training improves performance on content-specific source-based writing tasks. *International Journal of Artificial Intelligence in Education*, 28, 106-137.
- Widharyanto, B., & Binawan, H. (2020). Learning style and language learning strategies of students from various ethnics in Indonesia. *Jurnal Cakrawala Pendidikan*, 39(2), 480-492.
- Wu, J. (2015). *The influence of English majors' learning style on their English writing*. Doctoral dissertation, Qingdao University of Science and Technology.
- Yang, P. R. (2021). The diachronic analysis of TEM4 scores and its enlightenment to the teaching of English majors. *Journal of Liaoning University of Science and Technology* (02), 61-64.
- Zhao, J. D & Wei G. J. (2022). An exploration into the summary writing of new TEM4 question types from the perspective of discourse theory. *Journal of Hengshui U*
- Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College composition and communication*, 32(4), 365-387. *niversity*, 24(1), 4.
- Zhao, Q. Y., & Yang, S. F. (2022). Comparative Analysis of Language Complexity in English Argumentative Essay Writing of Chinese and Foreign College Students. *Journal of Henan University of Technology (Social Science Edition)* (04), 112-120. Doi: 10.16433/j.cnki.cn41-1379.2022.04.009