

Enhancing Chinese Vocabulary Memorization Skills Through Blooket Games Combined with Active Learning for First-Year Students in the Chinese Language Teaching Program at Rajabhat Mahasarakham University

Suphasa Phupunna¹ & Nareerat Hongsamsibkao²

¹ Department of Teaching Chinese Program, Faculty of Education, Rajabhat Mahasarakham University, Thailand, Mahasarakham, Thailand

² Department of Chinese, Faculty of Education, Uttaradit Rajabhat University, Thailand, Uttaradit, Thailand

Correspondence: Suphasa Phupunna, Department of Teaching Chinese Program, Faculty of Education, Rajabhat Mahasarakham University, Thailand, Mahasarakham, 44000 Thailand.

Received: March 3, 2024

Accepted: May 14, 2024

Online Published: June 24, 2024

doi:10.5539/jel.v13n5p191

URL: <https://doi.org/10.5539/jel.v13n5p191>

Abstract

This study investigates the effects of combining blooket games with active learning to improve Chinese vocabulary memorization in first-year Chinese Language Teaching students at Rajabhat Mahasarakham University. This approach aimed to make learning more engaging for Thai students. The intervention involved 26 participants and vocabulary improvement was measured from a pre-test to a post-test. The results showed a significant improvement from a mean of 13.42 ± 2.73 to 18.15 ± 1.26 , which was statistically significant at the .05 level. This study suggests that integrating blooket games with active learning can effectively improve Chinese vocabulary acquisition and recommends further investigation in different learning environments.

Keywords: Blooket Games, active learning, vocabulary memorization, Chinese Language Teaching, educational technology

1. Introduction

The economic and cultural ties between Thailand and the People's Republic of China have grown stronger in recent years, facilitated by the liberalization of trade and investment. This evolving relationship has led to an increased presence of Chinese tourists and businesspeople in Thailand, necessitating effective communication in Mandarin Chinese across various sectors (Feng et al., 2020; Hewison, 2018; Siriphon, 2019; Chantavanich, 2021). Consequently, the demand for Chinese language proficiency has surged, prompting educational institutions at all levels in Thailand to enhance their Chinese language programs (Rao, 2019; Chen et al., 2018; Teng et al., 2019; Guan & Frenkel, 2019).

Despite these efforts, challenges persist in teaching and learning Chinese effectively. Among the most significant issues is the complexity of Chinese vocabulary acquisition, attributed to the intricate nature of Chinese characters (Olmanson & Liu, 2017; Yang, 2022). This difficulty often leads to learner frustration, disinterest, and decreased motivation, underscoring the need for innovative teaching methods (Yang, 2018).

Active learning strategies, which engage students directly in the learning process, along with the integration of educational technology, have been identified as effective approaches to enhance language learning outcomes (Bean & Melzer, 2021; Tharayil et al., 2018; Wrahatnolo, 2018; Huang, 2019; Shafie et al, 2019; Liesa-Orús et al, 2020; Sulaiman & Ismail, 2020). Specifically, applications like Blooket offer a dynamic and competitive environment that can significantly improve vocabulary retention by combining the principles of active learning with the engaging aspects of gamified technology (Wongsaming, Yonwilad, & Tongmual, 2023; Nappe, 2023; Khalip & Li, 2023; Pedersen, 2022; Thongrach & Jantarach, 2023).

This study aims to investigate the effectiveness of utilizing Blooket alongside active learning techniques to improve vocabulary memorization among first-year students in the Chinese Language Teaching program at Rajabhat Mahasarakham University. By fostering an engaging and stimulating learning environment, this research seeks to address the noted challenges in Chinese language acquisition, with the ultimate goal of enhancing student

outcomes in language proficiency.

2. Method

2.1 Research Objectives

- 1) To compare the memorization skills before and after using the Blooket game in combination with active learning methods among first-year students of the Chinese Language Teaching program at Rajabhat Mahasarakham University.
- 2) To investigate the satisfaction of first-year students in the Chinese Language Teaching program at Rajabhat Mahasarakham University with the use of the blooket game and active learning methods.

2.2 Sample Size

The population of this study consists of first year students at Rajabhat Mahasarakham University enrolled in Chinese Reading 1 course, totaling 54 subjects.

The sample used in this study consists of first-year students in the Chinese language teaching program at Rajabhat Mahasarakham University. The sample group was selected using a purposive sampling method from the first-year students enrolled in the Chinese Reading 1 course who have memory performance problems, a total of 26 subjects. This was determined using a Chinese vocabulary memorization test consisting of 50 items covering the basic vocabulary of the Chinese language, with a total score of 100 points. Students who scored less than 60% were categorized as having memory problems and were selected as the sample group for this study.

2.3 Research Instruments

- 1) The Chinese language learning plan consists of five plans: ① Learning Plan 1 (北京的四季), ② Learning Plan 2 (租房子要一个条件), ③ Learning Plan 3 (我和父亲的战争), ④ Learning Plan 4 (最认真的快递员) and ⑤ Learning Plan 5 (最好的教育), each plan lasting 3 hours, for a total of 15 hours.
- 2) Exercises to memorize Chinese vocabulary through the Blooket program in combination with Active Learning consist of activities such as vocabulary matching (learners have to match Chinese vocabulary with the corresponding meaning or picture), cloze (learners complete sentences or articles with missing Chinese vocabulary), time competition (learners answer Chinese vocabulary questions within a given time) and category games (learners categorize Chinese vocabulary according to given categories). The duration of the exercise is about 20–30 minutes, so that learners have enough time to answer questions and repeat vocabulary. To improve vocabulary memorization, the research team uses illustrations and sounds to help learners better remember the vocabulary, reviews the vocabulary at the end of the exercise, and uses a variety of games and activities to reduce stress and increase enjoyment of learning.
- 3) Skill test to measure Chinese vocabulary with the Blooket program in combination with active learning methods before and after the course comprises a total of 50 questions. The format of the test is multiple choice and includes tasks such as translating vocabulary from Chinese to Thai, filling in missing vocabulary in sentences, matching vocabulary to the correct meaning and selecting the wrongly used vocabulary in a sentence. The scoring criteria should be the same for each question, with a total score of 100 points to assess students' ability to memorize vocabulary. Students who score 80% or more are very good at memorizing vocabulary. Scores between 60% and 79% are considered good, and scores below 60% indicate that improvements and additional help are needed in the vocabulary to be memorized.
- 4) The questionnaire on satisfaction with the development of vocabulary memory skills through the Blooket program in combination with Active Learning comprises a total of 10 questions.

2.4 Research Tools

- 1) The Chinese language learning plan involves studying theories and principles from textbooks and research to define learning objectives, content, activities, assessment methods and resources. The plan is divided into five learning plans, each lasting 3 hours, for a total of 15 hours. The plans are reviewed by experts in Chinese content, curriculum and teaching methods using an Index of Item Objective Congruence (IOC) for accuracy, appropriateness and content validity (Likert, 1932). An IOC score of 0.93 indicates the highest level of quality.

The revised plans are submitted to the experts for final verification of accuracy. A trial was conducted at Uttaradit Rajabhat University with 20 first year Chinese language students to calculate the reliability of the instruments using Cronbach's alpha coefficient (Cronbach, 1951) of 0.83. The schedules were then reviewed and adjusted based on quality checks, and the completed schedules were used for data collection.

- 2) A Chinese vocabulary memorization exercise using the Blooket program and active learning was developed for

first year students of the Chinese language teaching program at Rajabhat Mahasarakham University. The exercise was developed using techniques from books, documents and related research. The exercise was submitted to experts for review, which yielded an item objective congruence (IOC) index of 0.86. A revised exercise was submitted for a second round of review. A trial run was conducted with 20 first year Chinese language students at Uttaradit Rajabhat University and the reliability of the instrument was reported to be 0.957. After passing the quality check, further adjustments were made and the final exercise was used for data collection.

3) The process of creating a skill test to measure Chinese vocabulary with the Blooket program in combination with active learning methods. The process includes the study of test development methods, analyzing lesson content and objectives, and the development of a test with 60 items covering the main topics, essential vocabulary, meanings and sentences. The test is presented to three experts who check the content validity and calculate the Index of Item-Objective Congruence (IOC). The selected test items are then trialed with first year Chinese language students at the Faculty of Education, Uttaradit Rajabhat University to determine the level of difficulty and discrimination index. The test results are then analyzed to determine the level of difficulty and discrimination index. The reliability of the selected 50 test items is evaluated using Kuder-Richardson formula 20 (KR-20) (Horst, 1953) with a reliability value of 0.91. The test will then be used with another 20 first-year Chinese language students to analyze the test results. The quality-checked test will be reviewed and finalized before it is used for data collection.

4) The questionnaire on satisfaction with vocabulary memorization skills improvement through the Blooket program combined with Active Learning was developed by researching questionnaire construction methods from textbooks and research documents. The questionnaire was divided into three sections: Gathering basic information from respondents, measuring the level of satisfaction with skill development, and gathering additional comments and suggestions.

The questionnaire was submitted to three experts, including two specialists in Chinese language and one in curriculum and teaching methods, to check the comprehensiveness, clarity and linguistic accuracy of the questions. The experts checked the content validity of the questionnaire and the index of item-objective congruence (IOC) and found acceptable content validity. The analysis showed that all units of the learning material met the criterion with an IOC value of 0.80.

The satisfaction questionnaire was revised according to expert recommendations to ensure clarity and accuracy. The revised questionnaire was resubmitted to the experts for final review to confirm accuracy and completeness. The full satisfaction questionnaire was then used in data collection to assess satisfaction with the development of vocabulary memory skills through the Blooket program and Active Learning.

3. Data Collection

The process of enhancing Chinese Vocabulary Memorization Skills through Blooket Games Combined with Active Learning entails several structured steps. Initially, students undertake a pre-learning vocabulary test, which comprises 50 questions and totals 100 points, conducted one hour prior to the initiation of the learning sessions. This pre-assessment aims to gauge the students' vocabulary knowledge before exposure to the instructional content.

Subsequently, the instructional phase is executed through structured exercises leveraging the Blooket program, integrated with Active Learning strategies. This educational content is systematically segmented into five distinct learning plans, with each session extending for three hours, cumulatively accounting for a total instructional time of 15 hours.

Upon completion of these learning modules, a post-learning assessment is conducted that mirrors the format of the pre-learning test—consisting of 50 questions with a possible total of 100 points—to assess students' vocabulary acquisition after the intervention.

In addition to the vocabulary tests, students are requested to fill out a satisfaction questionnaire post-lesson. This questionnaire seeks to capture their feedback on the efficacy and engagement of developing vocabulary skills through the innovative combination of the Blooket program and Active Learning methodologies.

The comprehensive data garnered from both the pre- and post-learning assessments, along with the satisfaction questionnaires, are then meticulously analyzed to assess the effectiveness of the teaching strategies, the engagement level of the students, and the overall success of the vocabulary development program.

4. Data Analysis

Analysis of personal data this part of the analysis focuses on the demographic characteristics of the participants, especially their gender and previous experience in learning Chinese. Descriptive statistics are used to obtain an

overview of these variables. The analysis is presented by calculating the arithmetic mean (mean) and standard deviation (SD). The mean represents a central value for the data set, indicating the average experience of the participants in learning Chinese, while the standard deviation provides information about the variability or dispersion of learning experiences from the mean.

The core of the study involves comparing the mean scores of Chinese vocabulary memorization before and after the instructional intervention. This comparison is conducted using a t-test, a statistical examination employed to determine if there is a significant difference between the mean scores of two groups, which in this case are the scores before and after the study. The t-test facilitates an independent analysis by comparing the mean values (Mean) and standard deviations (SD) of the pre-study and post-study scores. This comparison aims to evaluate the effectiveness of the combined Blooket games and Active Learning strategies in enhancing the vocabulary memorization skills of the participants. The results from the t-test will help in determining whether the instructional approach has led to a statistically significant improvement in the students' vocabulary knowledge.

5. Results

Table 1. Personal data of first-year students in the Chinese Language Teaching Program, categorized by gender and experience in learning Chinese

Personal Information	Number of Students (20 total)	Percentage
Gender		
Male	2	7.69
Female	24	92.30
learning experience in Chinese language		
Less than 1 year	2	7.69
1–2 years	15	57.69
More than 2 years	9	34.62

Table 1 shows that the students are predominantly female (92.30%), compared to 7.69% male. Most of them have between 2 and 3 years of Chinese language learning experience (57.69%). This is followed by those with more than 3 years of experience, accounting for 34.62%, and those with less than 2 years of experience, accounting for 7.69%.

Table 2. Comparison of first-year students' memorization skills in Chinese Language Teaching Program before and after the study with the Blooket program in combination with active learning

Score (out of 50)	Mean (\bar{x})	Standard Deviation (S.D.)	t-value	Degrees of Freedom (df)	Significance (sig)
Before Learning	13.42	2.73	8.42	25.00	0.00
After Learning	18.15	1.26			

Table 2 shows the results of memory development using the Blooket program in combination with Active Learning for first-year Chinese Language Teaching Program. It is found that the scores after learning, with a mean of 18.15 ± 1.26 , are higher than before learning, which had a mean of 13.42 ± 2.73 . There is a statistically significant difference at the .05 level.

Table 3. Assessment of students' satisfaction in the first year of Chinese language teaching in terms of developing memory skills with the Blooket program in combination with active learning

Assessment Item	\bar{x}	S.D.	Level of Satisfaction
1. Comprehensibility and user-friendliness of the Blooket program	4.80	0.40	Highest
2. Fun and engaging learning through Blooket	4.57	0.58	Highest
3. Appropriateness of the content presented via Blooket for memorizing vocabulary	4.88	0.33	Highest
4. Improving the ability to memorize vocabulary after learning	4.80	0.40	Highest
5. Overall satisfaction with the Active Learning teaching process	4.61	0.57	Highest
6. Opinions on cooperation in the group when using Blooket	4.84	0.37	Highest
7. Ability to apply the content learned from Blooket to other learning contexts	4.76	0.43	Highest
8. Frequency of future desire to use this type of learning tool	4.92	0.27	Highest
9. Satisfaction with teacher support and feedback while using Blooket	4.73	0.45	Highest
10. Assessment of the difficulty of the questions and activities in Blooket	4.96	0.20	Highest
Total	4.78	0.40	Highest

Table 3 shows that students in the first year of Chinese language teaching are very satisfied with the learning activities made possible by the combination of the Blooket program with Active Learning. Overall, the satisfaction level is very high with an average score of 4.78 and a standard deviation of 0.40, indicating the highest satisfaction level.

6. Discussion

The development of Chinese vocabulary memorization skills through blooket program and active learning for first year Chinese Language Teaching program at Rajabhat Mahasarakham University can be described by the following objectives:

The improvement of memorization skills using the Blooket program in combination with Active Learning for first year Chinese Language Teaching program at Rajabhat Mahasarakham University showed that the post-learning scores averaged 18.15 with a standard deviation (S.D.) of 1.58, which was higher than the pre-learning scores which averaged 13.42 with a S.D. of 7.45. This difference was statistically significant at the .05 level.

This research is consistent with the work of Khan et al. (2017), which discusses how active learning methods can improve student engagement and potentially increase memory and comprehension in an online learning environment. It is also consistent with the research of Tharayil et al. (2018), which provides insight into the effective implementation of active learning strategies in the classroom to improve learning outcomes, including memory skills.

Furthermore, the study is in line with the findings of Daly-Smith et al. (2018), who investigate the effects of physically active learning on cognition and academic performance, including memory improvement. In addition, the study is supported by Stillesjö et al. (2021), who found that active learning in math and grammar engages similar brain networks, demonstrating that the benefits of active learning can also be applied to other subjects. This supports the idea that active learning strategies can improve long-term retention and cognitive performance.

The study examines student satisfaction with the learning activities facilitated by the integration of the Blooket program and Active Learning methods for first year Chinese Language Teaching program at Rajabhat Mahasarakham University. Overall satisfaction is high, with a mean score of 4.78 and a standard deviation of 0.40, indicating a very high level of satisfaction.

This research is in line with the findings of Pham and Ly (2023) who investigated the use of Blooket in English as a Foreign Language (EFL) grammar classes. Their study found that students positively rated the perceived usefulness of the system, ease of use, attitude toward using the technology, behavioral intentions to use the system, and overall satisfaction, indicating that students found Blooket useful for improving their grammar performance.

Furthermore, this research is in line with the study by Bratel et al. (2021), which discusses the transition to online teaching and learning during a global crisis. It notes that applications such as Blooket, which contain a strong competitive element, can motivate students, potentially increasing student satisfaction.

In addition, a study by Trần Nguyễn Minh Thu and Thai Cong Dan (2023) focused on students' perceptions of using Blooket to learn English vocabulary. The results showed that students were very interested in learning vocabulary with Blooket and showed a high level of satisfaction. The interactive and innovative nature of the Blooket games made the learning process more engaging and effective, highlighting the significant impact of such technological tools in education.

7. Conclusion

The study investigates enhancing Chinese vocabulary memorization through Blooket games and Active Learning among first-year Chinese language teaching students at Rajabhat Maha Sarakham University. It aims to compare memorization skills before and after using Blooket combined with Active Learning and examines student satisfaction with these methods. The methodology includes purposive sampling of students with memorization difficulties, employing learning plans, Blooket exercises, and pre-post vocabulary tests. Initial findings suggest significant improvement in vocabulary skills and high student satisfaction, indicating Blooket and Active Learning as effective educational tools for language acquisition.

7.1 Recommendations for Future Research

- 1) Future research should compare the results of learning with Blooket games with other learning techniques to understand when and why Blooket becomes an effective tool in the language classroom.
- 2) Investigate which components of the Blooket game (such as competition, rewards, creating challenges) have the greatest impact on student learning and memorization.
- 3) Explore how learners of different abilities or backgrounds engage with Blooket games and how this affects their learning outcomes.
- 4) Research should investigate how Blooket games can be adapted for use in different learning environments, such as online learning, blended learning or in large classrooms.
- 5) Further research on the long-term effects of using blooket games in Chinese language learning is needed to determine how they contribute to improving language skill over time.
- 6) Engage in a discursive evaluation of the theoretical frameworks that inform this pedagogical experiment, particularly how theories of active learning and game-based learning intersect with language acquisition theories. This should provide a holistic understanding of the effectiveness of educational tools like Blooket in language learning.

Acknowledgments

We extend our deepest gratitude to the Department of Teaching Chinese Program at Rajabhat Mahasarakham University and the Department of Chinese at Uttaradit Rajabhat University for their support and the facilities they provided which were helpful in carrying out this research. Finally, our special thanks go to the students who participated in this study for their time and commitment. Without them, this research would not have been possible.

Authors' contributions

Suphasa Phupunna and Dr. Nareerat Hongsamsibkao were jointly responsible for the conceptual design and development of the methodology of the study. Dr. Nareerat Hongsamsibkao drafted and revised the manuscript. Suphasa Phupunna was responsible for data collection and data analysis. All authors thoroughly reviewed and approved the final manuscript, confirming their agreement with the interpretations and conclusions of the study.

Funding

Not applicable.

Competing interests

Not applicable.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

References

- Bean, J. C., & Melzer, D. (2021). *Engaging ideas: The professor's guide to integrating writing, critical thinking, and active learning in the classroom*. John Wiley & Sons.
- Bratel, O., Kostiuk, M., Okhrimenko, I., & Nanivska, L. (2023). Student-Centered Online Assessment in Foreign Language Classes. *World Journal of English Language*, 13(1), 185. <https://doi.org/10.5430/wjel.v13n1p185>
- Chantavanich, S. (2021). China's Rising Influence in Thailand: Translocal Human Mobility and Its Impact. *China's Rise in Mainland ASEAN: Regional Evidence and Local Responses*, 133–154. https://doi.org/10.1142/9789811217043_0006
- Chen, Y., Mao, Z., & Qiu, J. L. (2018). *Super-sticky WeChat and Chinese society*. Emerald Publishing Limited. <https://doi.org/10.1108/9781787430914>
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334. <https://doi.org/10.1007/BF02310555>
- Daly-Smith, A. J., Zwolinsky, S., McKenna, J., Tomporowski, P. D., Defeyter, M. A., & Manley, A. (2018). Systematic review of acute physically active learning and classroom movement breaks on children's physical activity, cognition, academic performance and classroom behaviour: understanding critical design features. *BMJ Open Sport & Exercise Medicine*, 4(1), e000341. <https://doi.org/10.1136/bmjsem-2018-000341>
- Feng, T. T., Gong, X. L., Guo, Y. H., Yang, Y. S., Pan, B. B., Li, S. P., & Dong, J. (2020). Electricity cooperation strategy between China and ASEAN countries under 'The Belt and road'. *Energy Strategy Reviews*, 30, 100512. <https://doi.org/10.1016/j.esr.2020.100512>
- Guan, X., & Frenkel, S. (2019). How perceptions of training impact employee performance: Evidence from two Chinese manufacturing firms. *Personnel Review*, 48(1), 163–183. <https://doi.org/10.1108/PR-05-2017-0141>
- Hewison, K. (2018). Thailand: An old relationship renewed. *The Pacific Review*, 31(1), 116–130. <https://doi.org/10.1080/09512748.2017.1357653>
- Horst, P. (1953). Correcting the Kuder-Richardson reliability for dispersion of item difficulties. *Psychological Bulletin*, 50(5), 371. <https://doi.org/10.1037/h0062012>
- Huang, R. (2019). *Educational technology a primer for the 21st century*. Springer Nature Singapore Pte Ltd. <https://doi.org/10.1007/978-981-13-6643-7>
- Khalip, N., & Li, K. L. (2023). TESL Trainee Teachers' Perceptions Toward Implementing Blooket in the Online English Language Teaching and Learning Process. *Malaysian Journal of ELT Research*, 20(2). <https://doi.org/10.52696/XFYG1507>
- Khan, A., Egbue, O., Palkie, B., & Madden, J. (2017). Active learning: Engaging students to maximize learning in an online course. *Electronic Journal of E-Learning*, 15(2), 107–115.
- Liesa-Orús, M., Latorre-Coscolluela, C., Vázquez-Toledo, S., & Sierra-Sánchez, V. (2020). The technological challenge facing higher education professors: Perceptions of ICT tools for developing 21st century skills. *Sustainability*, 12(13), 5339. <https://doi.org/10.3390/su12135339>
- Likert, R. (1932). *A technique for the measurement of attitudes*. Archives of psychology.
- Nappe, O. (2023). *Is Gamification a Curse or a Blessing? Teacher and Student Perspectives About the Use of Blooket in a High School Classroom*. Master's thesis.
- Olmanson, J., & Liu, X. C. (2017). *The challenge of Chinese character acquisition: Leveraging multimodality in overcoming a centuries-old problem*.
- Pedersen, L. I. (2022). *How can digital games be used as a resource for adaptive teaching in English?* Master's thesis, Inland Norway University.
- Pham, A. T., & Ly, D. T. (2023). *EFL Students' Perceptions on the Use of Blooket in Grammar Classes* (pp. 91–97). Proceedings of the 2023 8th International Conference on Distance Education and Learning. <https://doi.org/10.1145/3606094.3606117>
- Rao, P. S. (2019). The role of English as a global language. *Research Journal of English*, 4(1), 65–79.
- Shafie, H., Majid, F. A., & Ismail, I. S. (2019). Technological pedagogical content knowledge (TPACK) in

- teaching 21st century skills in the 21st century classroom. *Asian Journal of University Education*, 15(3), 24–33. <https://doi.org/10.24191/ajue.v15i3.7818>
- Siriphon, A. (2019). Developing entrepreneurship under the rise of China: Chinese migrant entrepreneurs in tourism-related businesses in Chiang Mai. In *The Sociology of Chinese Capitalism in Southeast Asia: Challenges and Prospects* (pp. 271–289). https://doi.org/10.1007/978-981-13-0065-3_12
- Stillesjö, S., Karlsson Wirebring, L., Andersson, M., Granberg, C., Lithner, J., Jonsson, B., ... Wiklund-Hörnqvist, C. (2021). Active math and grammar learning engages overlapping brain networks. *Proceedings of the National Academy of Sciences*, 118(46), e2106520118. <https://doi.org/10.1073/pnas.2106520118>
- Sulaiman, J., & Ismail, S. N. (2020). Teacher competence and 21st century skills in transformation schools 2025 (TS25). *Universal Journal of Educational Research*, 8(8), 3536–3544. <https://doi.org/10.13189/ujer.2020.080829>
- Teng, W., Ma, C., Pahlevansharif, S., & Turner, J. J. (2019). Graduate readiness for the employment market of the 4th industrial revolution: The development of soft employability skills. *Education+ Training*, 61(5), 590–604. <https://doi.org/10.1108/ET-07-2018-0154>
- Tharayil, S., Borrego, M., Prince, M., Nguyen, K. A., Shekhar, P., Finelli, C. J., & Waters, C. (2018). Strategies to mitigate student resistance to active learning. *International Journal of STEM Education*, 5, 1–16. <https://doi.org/10.1186/s40594-018-0102-y>
- Thongrach, N., & Jantarach, V. (2023). *The Development of English Vocabulary Learning Ability by Using Games And Blooket Application For Grade 3 Students*.
- Thu, T. T. M., & Dan, T. C. (2023). STUDENTS' PERCEPTIONS ON ENGLISH VOCABULARY TEACHING AND LEARNING BY USING BLOOKET: A CASE STUDY/NHẬN THỨC CỦA SINH VIÊN VỀ VIỆC DẠY VÀ HỌC TỪ VỰNG TIẾNG ANH BẰNG BLOOKET: MỘT NGHIÊN CỨU TÌNH HUỐNG. *European Journal of Applied Linguistics Studies*, 6(1). <https://doi.org/10.46827/ejals.v6i1.321>
- Wongsaming, A., Yonwilad, W., & Tongmual, N. (2023). The effectiveness of cooperative learning management using the TGT technique and Blooket applications towards problem-solving abilities of seventh grade students. *Journal of Green Learning*, 3(1), 17–26.
- Wrahatnolo, T. (2018). 21st centuries skill implication on educational system. In *IOP Conference Series: Materials Science and Engineering* (Vol. 296, No. 1, p. 012036). IOP Publishing. <https://doi.org/10.1088/1757-899X/296/1/012036>
- Yang, J. (2018). What makes learning Chinese characters difficult? The voice of students from English secondary schools. *Journal of Chinese Writing Systems*, 2(1), 35–41. <https://doi.org/10.1177/2513850217748501>
- Yang, J. (2022). Teenage beginners' perceptions of learning Chinese characters: A case study. *Journal of Chinese Writing Systems*, 6(1), 3–15. <https://doi.org/10.1177/25138502221050960>

Copyrights

Copyright for this article is retained by the author, with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).