IDEAS
Journal of Language Teaching and Learning, Linguistics and Literature
ISSN 2338-4778 (Print)
ISSN 2548-4192 (Online)
Volume 13, Number 1, June 2025
pp. 1517 - 1532

Issued by English study program of IAIN Palopo

The Impact of Artificial Intelligence (AI) Technology Usage on English Skills Among Thai High School Students

Fenna Monica Sitorus [1], Jamaluddin Nasution [2], Lisa Septia Dewi Br. Ginting [3]
[1]Universitas Prima Indonesia, Medan
[2]Universitas Prima Indonesia, Medan
[3]Universitas Muslim Nusantara, Indonesia
Corresponding E-Mail: fennamonicaa@gmail.com

Received: 2025-06-04 Accepted: 2025-07-14
DOI: 10.24256/ideas. v13i1.6912

Abstract
This study aims to examine the impact of rule-based artificial intelligence programs, including the Duolingo the tool Grammarly, Babbel, and ELSA Speak, on the English language proficiency of Thai high school students. Samples was gathered using an orderly descriptive a combination of methods methodology, involving questionnaires and in-depth interviews with 30 purposefully chosen students that regularly utilized powered by artificial intelligence language instruction programs. The statistical findings indicate that AI utilization has a notable but constrained effect, accounting for 13.8% of the variance in students to English proficiency. Qualitative results revealed that students perceived AI applications as helpful for improving grammar and pronunciation, though less effective for complex language tasks requiring contextual understanding. Although the sample size restricts generalizability, the research presented here emphasizes the possible uses of AI as an auxiliary instrument in English language acquisition and stresses the necessity of aligning AI implementation with educational methodologies appropriate for the Thai academic and cultural milieu.

Keywords: *Artificial Intelligence; English Skills; High School Students; Language Learning*

Introduction

The rapid expansion of internet usage has emerged as a significant catalyst for technological innovation and knowledge dissemination (Szymkowiak et al., 2021). Access to information has become increasingly attainable, particularly for individuals proficient in English, the global lingua franca (Leyi, 2020). In Thailand, internet adoption has surged, as evidenced by data from digitalmarketingforasia.com/2024-digital-marketing-landscape-of-thailand/, which reported that by early 2024, approximately 63.21 million individuals—88% of the population—were internet users. Furthermore, there were 49.1 million active social media users, comprising 68.3% of the total population.

On average, users spent nearly eight hours online daily, underscoring a high level of digital engagement. This digital transformation is further reinforced by the widespread penetration of mobile technology, with 97.81 million active mobile connections—equivalent to 136.1% of the population. Such ubiquity of internet and mobile access positions Thailand as a digitally connected society, where technology usage has become integral to everyday life and has created new pathways for language learning, especially through mobile-assisted platforms.

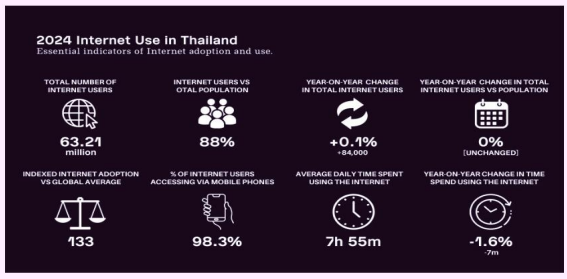

Figure 1.1 Internet Usage in Thailand in 2024

Sources Data: https://www.digitalmarketingforasia.com/2024-digital-marketing-landscape-of-thailand/

Figure 1.1, titled *"Internet Usage in Thailand in 2024"*, provides an overview of this digital landscape. It shows that 98.3% of internet users access the web via mobile phones, offering Thai students wide-ranging opportunities to engage with English learning resources such as language applications, digital platforms, videos, and virtual courses. Based on the 2024 data, internet users increased by 84,000 individuals compared to the previous year. Despite a slight year-over-year decline in daily online activity (about seven minutes), digital usage remains highly conducive to both formal and informal educational access, including English language acquisition.

English proficiency is essential not only for academic achievement but also for engaging with global knowledge, technological advancements, and career opportunities (Wei, 2023; Zhang, 2022). Historically rooted in British political

ISSN 2338-4778 (Print)
ISSN 2548-4192 (Online)

influence, English has evolved into a universal medium adopted by many nations for academic and professional purposes. As (Sumartini & Suardana, 2024) assert, standardized English enhances international cooperation and clarity in communication. In Thailand, English education is embedded within the national curriculum from the elementary level onward; however, secondary school students often struggle to attain adequate proficiency. (Jeensuk, S., & Sukying, 2021), referencing Suwanarak and Phothongsunan, attribute this challenge to insufficient exposure to English beyond the classroom environment.

The Thai educational system, which is governed by the Basic Education Core Curriculum B.E. 2008 within the Competency-Based Education (CBE) framework, aims to prepare students with the necessary abilities to address global challenges. Nevertheless, (Lee et al., 2023) contend that the curriculum falls short in cultivating the English competencies needed to realize the national vision encapsulated in "Thailand 4.0." Amid these challenges, the global rise of artificial intelligence (AI) presents new opportunities for educational enhancement, especially in language learning domains.

One subfield of computing sciences, known as the study of artificial intelligence (AI) concentrates on computer programming to mimic the intellect of humans in specific contexts (Eriana & Zein, 2023). Computer and associated technology may learn from data, identify patterns, and make educated judgments with the help of artificial intelligence (AI), which employs mathematical frameworks and algorithms. According to (Ziyad, 2021), Artificial intelligence (AI) is the study and creation of computer systems that can perform activities typically requiring human cognitive ability. Algorithms developed for artificial intelligence are programmed to learn, see, solve problems, understand spoken language, and make decisions logically. Furthermore, (Ghosh & Arunachalam, 2023) characterize artificial intelligence as a subfield of computational science that focuses on developing smart machines capable of comprehend, evaluate, and react correctly to user inputs.

Among various AI classifications, this study focuses on **rule-based AI applications**, defined as language learning tools programmed with fixed rules and feedback mechanisms that provide structured instruction—such as Duolingo, Grammarly, Babbel, and ELSA Speak. These applications offer learners interactive practice in pronunciation, grammar, and writing by simulating aspects of a human tutor. Their rule-governed nature allows consistent feedback and performance tracking, making them increasingly popular among students for autonomous learning. The worldwide market for artificial intelligence in education, which was estimated to be worth around $2.5 billion in 2022, is anticipated to expand to $6 billion by 2025. This growth is largely fueled by increasing demand for tailored learning solutions and enhanced teaching effectiveness. By 2024, the market value had already escalated to $5.88 billion, with estimates showing a strong compound annual growth rate (CAGR) of 31.2% from 2025 to 2030..

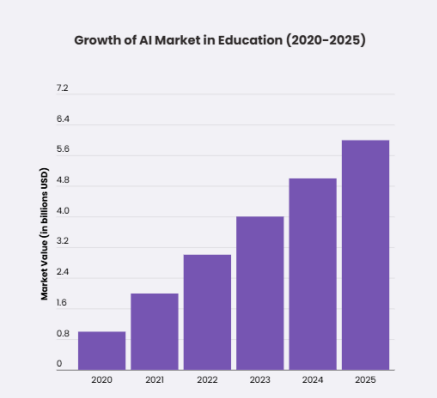

Figure 2. Growth of AI Market in Education (2020-2025)

Sources Data:https://www.allaboutai.com/resources/ai-statistics/education/

Figure 2, *"Growth of AI Market in Education (2020–2025)"*, reflects this expansion, particularly in Asia-Pacific regions including Thailand, where education reforms and digital infrastructure accelerate the adoption of educational technologies. In fact, nearly 60% of teachers now report integrating AI tools into daily instruction.

However, despite these trends, **empirical studies on AI's specific influence on English language acquisition in Southeast Asia remain scarce.** According to Kundu and Bej (2025), there are still some significant gaps in understanding the impact of artificial intelligence (AI) on specific language skills, including writing, speaking, and grammar, especially among those who use English as a second language.

Within the context of Thailand, although students increasingly engage with AI-driven applications informally, their incorporation into formal educational curricula remains limited and insufficiently examined. Previous studies have largely overlooked how students themselves perceive and benefit from AI applications in real-world learning contexts.

The present study aims to fill that void by investigating how artificial intelligence (AI) apps affect the English competency of Thai secondary school students. We pay careful consideration to how these instruments impact their abilities in communicating through writing, speaking, and understanding grammar. In order to provide a more complete picture of how governed by rules AI tools might aid language acquisition in a technologically advanced but academically conservative culture, this study intends to examine not only the quantitative effects of AI use but also students' actual perspectives and first-hand knowledge.

ISSN 2338-4778 (Print)
ISSN 2548-4192 (Online)

Method

To investigate in depth the impact of rule-based artificial intelligence (AI) applications such as Duolingo, Grammarly, Babbel, and ELSA Speak on the English language skills of high school students in Thailand, this study applied a combined iterative method that integrated quantitative and qualitative data. A sequential explanatory design was chosen over a concurrent approach so that the results of the quantitative phase could influence the qualitative phase. This approach allows for a deeper understanding of statistical trends as well as a more detailed exploration of students' personal experiences with AI tools, providing richer insights into how and why these applications support language development.

First, we conducted in-depth interviews with students to understand how they use this AI tool in learning English. Next, we administered a structured survey to measure the extent of students' progress in five different aspects related to language proficiency: speaking, listening, reading, writing, and grammar. Using a 1–5 Likert scale that includes specific indicators such as pronunciation, paragraph structure, comprehension, and grammar accuracy, this evaluation adopts analytical criteria directly taken from the TOEFL exam.

The study was carried out in multiple public and private senior high schools in Thailand during **October 2024**, with data collection lasting approximately **four weeks**. A total of **32 students** were selected using purposive sampling. The selection criteria included: (1) students enrolled in grades 10 to 12, (2) aged between 15 and 18 years, (3) had used at least one rule-based AI application for a minimum of three months prior to the study, and (4) used the application at least three times a week. The students came from diverse socioeconomic backgrounds, as indicated by school profiles and self-reported data, including children of civil servants, private employees, and informal workers. English proficiency levels varied, ranging from basic to intermediate, as estimated through self-reports and confirmed through placement levels at school.

Primary data was obtained directly from students, while secondary data included scientific journals, books, and relevant research reports to support the analysis. The qualitative component involved semi-structured interviews with selected participants representing various levels of involvement with AI. Each interview lasted between 30 and 45 minutes and followed a guide covering themes such as motivation for using AI, preferred features, challenges faced, and outcomes of its use. Responses from the interviews were recorded, transcribed, and analyzed thematically using coding procedures adapted from the Braun & Clarke framework, so that different patterns and perspectives could be identified systematically.

Data analysis was conducted through a systematic procedure encompassing data reduction, presentation, and conclusion-drawing, as described by Sugiyono (2017), supplemented by descriptive statistical analysis to summarize variable characteristics. The results of Cronbach's Alpha indicate reliability and item-total correlation confirming the validity of the instrument, with values above 0.6,

indicating adequate consistency (Arsi, 2021). The data were deemed suitable for further analysis after assessing conventional assumptions, such as the Kolmogorov-Smirnov test for normality and homogeneity (Mardiatmoko, 2024). A simple linear regression model was used to test the hypothesis regarding the correlation between AI use and language competence. Explanatory power was measured using the coefficient of determination (R^2). The data collection method combines purposive sampling, thematic analysis of interview transcripts, and Likert scale questionnaires, enabling strong triangulation of findings (Afshar & Hafez, 2021). This integrated methodology ensures a comprehensive understanding of how AI applications influence English language learning outcomes among high school students in Thailand.

Results

Respondent Characteristics

A total of 30 students participated in this study, consisting of 16 male and 14 female respondents. This near-equal gender distribution ensures that the data collected reflect a balanced perspective regarding the use of AI applications in English language learning. The diversity of gender representation also contributes to the validity of the findings by avoiding potential bias linked to gender-related language acquisition patterns

Table 1. Respondent Characteristics

Gender	**Amount**
Man	16
Woman	14
Total	30

According to Table 1, a total of 30 participants, consisting of 16 men and 14 women, were involved in this study.

Descriptive Statistical Test Results

Table 2. Results of Descriptive Statistical Tests

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Total-Y	30	5	25	15.93	6.486
Total-X	30	13.00	22.00	18.8000	2.04096
Valid N (listwise)	30				

ISSN 2338-4778 (Print)
ISSN 2548-4192 (Online)

The descriptive statistical analysis of 30 respondents revealed that the mean score for students' English language proficiency (Y) was 15.93, accompanied by a standard deviation of 6.486, suggesting considerable variability in their abilities. In contrast, the average utilization of AI technology (X) was 18.80 with a standard deviation of 2.04, reflecting a generally high and consistent level of usage among the participants.

Validity Test Results for the Variable of AI Usage (X)

Table 3. Results of Validity Test of Variable X

Item No.	R-xy	R-table (5%)	Information
1	0.665	0.361	Valid
2	0.698	0.361	Valid
3	0.611	0.361	Valid
4	0.656	0.361	Valid
5	0.568	0.361	Valid

The validity test results for variable X, as shown in the table above, indicate that the computed R-values for all instrument items surpass the required R-value of 0.361. Consequently, all elements inside variable X are deemed legitimate. This finding is likewise relevant to the variable assessing students' English-speaking proficiency (Y).

Validity Test Results for the Variable of students' English-speaking ability (Y).

Table 4. Results of the Validity Test of Variable Y

Item No.	R_{xy}	R-table (5%)	Information
1	0.651	0.361	Valid
2	0.559	0.361	Valid
3	0.621	0.361	Valid
4	0.650	0.361	Valid
5	0.533	0.361	Valid
6	0.645	0.361	Valid
7	0.611	0.361	Valid
8	0.643	0.361	Valid
9	0.607	0.361	Valid
10	0.621	0.361	Valid
11	0.577	0.361	Valid
12	0.631	0.361	Valid
13	0.529	0.361	Valid
14	0.527	0.361	Valid
15	0.547	0.361	Valid
16	0.700	0.361	Valid
17	0.642	0.361	Valid
18	0.632	0.361	Valid
19	0.631	0.361	Valid
20	0.594	0.361	Valid
21	0.649	0.361	Valid
22	0.552	0.361	Valid
23	0.590	0.361	Valid
24	0.560	0.361	Valid
25	0.670	0.361	Valid

ISSN 2338-4778 (Print)
ISSN 2548-4192 (Online)

Reliability Analysis for Variable of AI Usage (X)

Table 5. Results of Reliability Test of Variable X

Reliability Statistics	
Cronbach's Alpha	N of Items
.633	5

The Cronbach's Alpha reliability test, as seen in the graphic previously, produced a coefficient of 0.633. averaging this amount is above the criterion of 0.60, it may be inferred that Variable X exhibits satisfactory dependability.

Reliability Analysis for Variable of students' English-speaking ability (Y).

Table 6. Results of Reliability Test of Variable Y

Reliability Statistics	
Cronbach's Alpha	N of Items
.929	25

Based on the data presented in the table above, the Cronbach's Alpha coefficient for Variable Y was calculated to be 0.929. The outcomes provided demonstrate a reliability value significantly higher than the 0.60 threshold, it can be concluded that the measurement tool for Variable Y shows excellent internal consistency and is highly reliable for use in this study.

Classical Assumption Test: Normality Test

Table 7. Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		30
Normal Parameters [a,b]	Mean	.0000000
	Std. Deviation	7.33309008
Most Extreme Differences	Absolute	.154
	Positive	.124
	Negative	-.154
Test Statistics		.154
Asymp. Sig. (2-tailed)		.067 [c]

The significant value of 0.067, found using the aforementioned Kolmogorov-Smirnov normalcy test, is higher than the commonly used alpha threshold of 0.05. The data in this research satisfy the normalcy assumptions needed for later parametric analysis, since the derived value for importance surpasses the threshold (Nurhaswinda et al., 2022).

Classical Assumption Test: Homogeneity Test

Table 8. Homogeneity Test Results

Test of Homogeneity of Variances					
		Levene Statistics	df1	df2	Sig.
Variable (Y)	Based on Mean	.864	6	19	.539
	Based on Median	.435	6	19	.846
	Based on Median and with adjusted df	.435	6	14,419	.844
	Based on trimmed mean	.794	6	19	.586

The computed homogeneity value was 0.586, which is significantly more than the declared significance threshold of 0.05, according to the findings of the sign homogeneity test given above. This finding provides additional evidence that the data is homogeneous, as there appears to be no significant variation among the data values in these variables. In terms of homogeneity, this is a critical consideration in all statistical analyses, ensuring that the variability within groups is consistent and that subsequent inferential tests yield valid and reliable results (Sitopu et al., 2021).

Hypothesis Testing: Simple Linear Regression Test

Table 9. Simple Linear Regression Test Results

ANOVA [a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	212,763	1	212,763	4.319	.047 [b]
	Residual	1329.995	27	49,259		
	Total	1542.759	28			

ISSN 2338-4778 (Print)
ISSN 2548-4192 (Online)

The F-value for the basic linear regression calculation is 4.319, and the Sig. level is 0.047, according to the findings. The logistic regression approach connecting the independent variable—AI use—and the dependent variable—students' the English-speaking ability—is considered significant as this significance value is lower than the alpha criterion of 0.05. This discovery suggests that students' skills in speaking English are significantly impacted by the employment of AI technology. There is evidence that the linear association between AI use and English competency may help explain some aspects of the observable variance in students' speaking skills.

Hypothesis Testing: Coefficient of Determination Test

Table 10. Results of the Determination Coefficient Test

Model Summary [b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.371 [a]	.138	.106	7.01848

Findings from the R-squared analysis, indicate that AI usage has a substantial impact on students' competency in English. But with an average coefficient of determination of 0.138 (13.8%), AI is able to clarify a small fraction of the variation in students fluent in English capabilities.

This suggests that while AI contributes significantly to students' language skills, 86.2% of the variation is caused by other external factors not covered in this model. Therefore, it is important to consider additional variables beyond AI utilization to fully understand and predict students' English-speaking performance. Here, the R^2 number indicates how well the regression model fits the data; it shows that the model explains some of the result but leaves a lot of variability unexplained, which highlights how complicated the elements are that impact language learning.

Discussion

Respondent Overview and Descriptive Results

This survey involved thirty respondents consisting of 16 men and 14 women, so that this composition reflects a comprehensive view of the use of AI technology in English as a foreign language (ESL) training by involving the perspectives of both genders. Descriptive statistical analysis showed a reference value of 6.486 compared to a reference average of 15.93, indicating significant variation in students' English proficiency levels. The average AI usage score was

18.8 with an average difference of 2.04, indicating that AI usage among respondents was relatively consistent.

With the calculated R value exceeding the r-table threshold of 0.361, the validity test confirmed the validity of each item assessing AI usage and English proficiency. This indicates that the tool used to measure the desired variables has good accuracy. Reliability analysis also supports these findings, showing strong internal consistency, particularly for the English-speaking skill variable, which has a Cronbach's Alpha value of 0.929, and 0.633 for AI usage. This indicates that respondents' interactions with AI are fairly stable.

The Kolmogorov normal distribution test yielded a statistically significant value of 0.067, exceeding the 0.05 criterion. This indicates that the residual probability distribution is symmetric and meets the basic standards for regression analysis. The homogeneity test also showed a significance level of 0.586, indicating that the differences in variance between categories are not statistically significant.

The results of the basic linear regression model show a strong correlation ($p < 0.05$) between AI usage and students' English language skills. This indicates that artificial intelligence (AI) has a positive impact on students' verbal communication skills. However, AI use only explains 13.8% of the variation in English language skills, with a coefficient of determination (R^2) of 0.138. These results indicate that although AI plays a role in language competence, there are other variables that explain most of the variation not covered in this study.

These outcomes are in line with earlier research. The research by Abimanto and Mahendro (2023) is one study on the significance of incorporating artificial intelligence (AI) into language learning courses. AI has been shown to dramatically enhance kids' speaking, listening, reading, and writing abilities. According to a research by Songsiengchai (2025), Chat GPT also makes interactive and real-time learning experiences possible, which speed up language acquisition. They warn that in order to fully benefit from AI in the classroom, it must complement traditional teaching techniques rather than try to operate independently.

To back up these claims, a literature analysis by (Arbi, 2024) looked at AI apps including Perplexity, Chat GPT, and ELSA Speak, and found that AI improves customization, learning efficiency, and interaction. The report highlights how AI is playing a growing role in addressing the needs of online learning. In addition, (Thanarak Santhuenkaew, 2024) highlighted the function of Chat GPT in enhancing writing abilities, pointing out that, along with Grammarly's emphasis on grammar errors, Chat GPT helps produce and polish material, leading to higher-quality writing overall.

Additionally, technological access limitations and associated costs pose significant barriers to widespread AI adoption. Artificial intelligence (AI) technology promises to continue improving English language learning. Its integration must be carefully balanced with traditional teaching methods to address the multifaceted nature of language learning and ensure equitable access

ISSN 2338-4778 (Print)
ISSN 2548-4192 (Online)

for all learners.

Additionally, the results indicate that language acquisition is multifaceted. Peer contact, exposure to real-world language use, sociocultural support, the quality of classroom instruction, and students' intrinsic drive are all likely to have a major impact on English competence. The dynamic, feedback-rich environment of human conversation is crucial for speaking growth, and while AI systems offer easily accessible and customized input, they frequently fall short in this regard.

Artificial intelligence (AI) technology offers promising support for improving English language learning. However, its integration must be done wisely alongside traditional teaching methods to address the complexity of the language learning process and ensure equitable access for all students. Teachers must be trained not only in the use of AI tools but also in helping students understand and apply AI-generated feedback in a meaningful way. For policymakers, investments should focus on developing infrastructure, digital resources, and inclusive AI integration.

Although this research provides useful information, there are several points to consider. First, the research results may not be generalizable to a larger population due to the very small sample size of only 30 students. The deliberate sampling strategy, which focused on students already using AI technology, may introduce bias, as students unwilling or unable to use such technology are not represented. Reliance on personal data also increases the risk that accuracy may be influenced by social desirability bias. Additionally, the short data collection window and cross-sectional techniques limit the ability to track language development over a longer timeframe.

For future research, it may be necessary to consider a broader and more representative sample of schools in both rural and urban areas of Thailand. To gain deeper insights into the long-term impact of AI use on competencies, longitudinal studies need to be conducted. Furthermore, comparative research between rule-based AI systems and generative AI systems could reveal differences in pedagogical effectiveness. Investigations into teachers' perspectives and classroom integration models could also provide practical guidance for implementation.

Conclusion of Discussion

Overall, this study demonstrates that while rule-based AI tools provide valuable support, particularly in grammar and pronunciation aspects, their impact is limited. The development of quantitative and qualitative phases indicates that AI tools function as effective complements, not replacements, for human-led instruction. This provides a balanced foundation for the informed, culturally relevant, and pedagogically appropriate implementation of AI in English language education in Thailand.

Conclusion

According to data analysis, AI technology has a minor influence on students' English competence (p = 0.047), accounting for 13.8% of the variation. The data satisfied regression assumptions, and instruments were valid and trustworthy. These findings support earlier research that highlighted AI's potential to deliver individualized and interactive learning. Still, there are obstacles to overcome, such as the necessity to combine AI with conventional instruction and the lack of human engagement. Therefore, in addition to traditional teaching techniques, instructors are advised to use AI technologies such as Chat GPT, Grammarly, and ELSA Speak to improve learning. Additionally, students must to use these tools on their own initiative. In order to get deeper insights, future research should increase sample sizes, variables, and mixed approaches. Meanwhile, AI developers could enhance contextual relevance to better accommodate learning demands.

Based on the results and limitations of the present study, several recommendations can be made for future research. First, **larger and more representative samples** including students from various regions and school types should be considered to enhance the generalizability of the findings. Second, researchers are encouraged to adopt **longitudinal designs** to assess the sustained impact of AI usage on language skill development over time.

Practically, educators should be trained not only to use AI applications but also to guide students in interpreting AI-generated feedback meaningfully. Policymakers and school administrators are advised to invest in **infrastructure, digital access**, and **curriculum alignment** to ensure that AI technology can be used equitably and effectively in support of language learning goals.

References

Abimanto, D., & Mahendro, I. (2023). Efektivitas Penggunaan Teknologi AI Dalam Pembelajaran Bahasa Inggris. Sinar Dunia: Jurnal Riset Sosial Humaniora Dan Ilmu Pendidikan, 2(2), 256–266. https://doi.org/10.58192/sidu.v2i2.844

Afshar, H. S., & Hafez, F. (2021). A mixed-methods investigation of TEFL graduate students' perspectives of qualitative research: Challenges and solutions in the spotlight. Qualitative Report, 26(5), 1444–1475. https://doi.org/10.46743/2160-3715/2021.4614

Arbi, A. P. (2024). The Role of ChatGPT in Writing Performance: A Review of Recent Studies. Asian Journal of Multidisciplinary Research, 1(1), 29–41. https://jujurnal.com/index.php/ajmr

Arsi, A. (2021). Langkah-Langkah Uji Validitas dan Reliabilitas Instrumen dengan Menggunakan SPSS. Sekolah Tinggi Agama Islam (STAI) Darul Dakwah Wal-Irsyad, 1–8. https://osf.io/preprints/osf/m3qxs

Eriana, E. S., & Zein, D. A. (2023). Artificial Intelligence. Angewandte Chemie International Edition, 6(11), 1.

ISSN 2338-4778 (Print)
ISSN 2548-4192 (Online)

Ghosh, M., & Arunachalam, T. (2023). Introduction to artificial intelligence. Toward Artificial General Intelligence: Deep Learning, Neural Networks, Generative AI, March 1–20. https://doi.org/10.1515/9783111323749-001

Jeensuk, S., & Sukying, A. (2021). An investigation of high school EFL learners' knowledge of English collocations. Journal of Applied Linguistics and Language Research, 8(1), 90-106.

Husnaini, H. (2022). Development of Self-Esteem-Oriented Micro-Teaching Materials for IAIN Palopo English Education Students. IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature, 10(1), 538-560.

Husnaini, H., Yahya, A., & Putri, N. I. W. (2023). The Efficacy of the Presentation, Practice, and Production (PPP) Method on the Speaking Skill of the English Learners Community (ELC) Students. EDULANGUE, 6(1), 45-61.

Iksan, M., Husnaini, H., & Masruddin, M. (2022). Implementation of a weekly English program with a fun learning method for Pesantren students. Ethical Lingua: Journal of Language Teaching and Literature, 9(2), 872-879.

Lee, T. Y., Ho, Y. C., & Chen, C. H. (2023). Integrating intercultural communicative competence into an online EFL classroom: an empirical study of a secondary school in Thailand. Asian-Pacific Journal of Second and Foreign Language Education, 8(1), 1–25. https://doi.org/10.1186/s40862-022-00174-1

Leyi, W. (2020). World Englishes (WE) and English as a Lingua Franca (ELF): Implications for English Teaching and Learning. International Journal of Information and Education Technology, 10(5), 389–393. https://doi.org/10.18178/ijiet.2020.10.5.1395

Mardiatmoko, G. (2024). The Application of the Classical Assumption Test in Multiple Linear Regression Analysis (a Case Study of the Preparation of the Allometric Equations of Young Makila). JTAM (Jurnal Teori Dan Aplikasi Matematika), 8(3), 724–739.

Masruddin, M., & Munawir, A. (2021). The Efficacy of Treasure Hunt Game With Luwu Local Culture Based on Teaching English Vocabulary and Introducing Cultural Heritages of Luwu at SMPIT Al Hafidz Kota Palopo. Kongres Internasional Masyarakat Linguistik Indonesia, 204-208.

Nurhaswinda, Maulina, S. R., Azzahra, Jannah, F., Jannah, N., Fadila, N. A., Harza, Z. J., & Putra, N. H. (2022). Penyajian Data. MIRACLE Journal, 2(1), 30–48.

Sitopu, J. W., Purba, I. R., & Sipayung, T. (2021). Pelatihan Pengolahan Data Statistik Dengan Menggunakan Aplikasi SPSS. Dedikasi Sains Dan Teknologi, 1(2), 82–87. https://doi.org/10.47709/dst.v1i2.1068

Songsiengchai, S. (2025). Implementation of Artificial Intelligence (AI): Chat GPT) for Effective English Language Learning among Thai Students in Higher Education. c, 302–312.

Sugiyono. (2017). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Alfabeta. http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-

Eng-8ene.pdf?sequence=12&isAllowed=y%0A
http://dx.doi.org/10.1016/j.regsciurbeco.2008.06.005%0A
https://www.researchgate.net/publication/305320484_SISTEM_PEMBETUNGAN_TERPUSAT_STRATEGI_MELESTARI

Sumartini, N. L. P. U., & Suardana, I. K. (2024). Pengaruh Penggunaan Kamus AI pada Mata Kuliah Bahasa Inggris bagi Mahasiswa Kampus Politeknik Nasional Denpasar. Proceedings of Seminar Nasional Riset Linguistik Dan Pengajaran Bahasa, September, 122–130.

Szymkowiak, A., Melović, B., Dabić, M., Jeganathan, K., & Kundi, G. S. (2021). Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. Technology in Society, 65 (January). https://doi.org/10.1016/j.techsoc.2021.101565

Syarani, N. (2024). TRILINGUAL FOLKSONGS BOOK: TRANSLATING TANA LUWU FOLKSONGS INTO AN ENGLISH-INDONESIAN SONGBOOK. English Language Teaching Methodology, 4(3), 428-441.

Thanarak Santhuenkaew. (2024). Internet of Things (IoT) Technology for a Creative, Intelligent, Interactive Classroom. RICE Journal of Creative Entrepreneurship and Management, 5(3), 70–76. https://doi.org/10.14456/rjcm.2024.18

Wei, L. (2023). Artificial intelligence in language instruction: impact on English learning achievement, L2 motivation, and self-regulated learning. Frontiers in Psychology, 14(November), 1–14. https://doi.org/10.3389/fpsyg.2023.1261955

Zhang, W. (2022). The Role of Technology-Based Education and Teacher Professional Development in English as a Foreign Language Classes. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.910315

Ziyad, M. (2021). Artificial intelligence definition, ethics, and standards. Artificial Intelligence Definition, Ethics, and Standards, 1–11.