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Research Article

Revolutionising Essay Writing Using Artificial Intelligence

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ABSTRACT

Introduction: With the emergence of Artificial Intelligence (AI), there is a need to integrate the latest technological tools such as generative AI in teaching essay writing. Thus, this study was carried out to examine the usefulness of Gemini AI in assisting students' essay writing.

Objectives: The Research Objectives (RO) for this study are to examine:
1. secondary school students' Perceived Usefulness (PU) of Gemini
2. secondary school students' Perceived Ease of Use (PEOU) of Gemini

Methods: The Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) of Gemini AI were analysed qualitatively through journal entries, participant observation, questionnaires and interviews.

Results: The findings show that students showed favourable responses towards the use of Gemini AI in assisting them in their essay writing. This is because Gemini AI does not only help students with generalisation of ideas and gaining new vocabulary, it also provides flexibility for them to learn at their own pace.

Conclusion: Hopefully, this study will bring useful insights to practitioners and researchers in using AI to teach essay writing to students.

Keywords: Artificial intelligence; student-centred learning; second language acquisition; essay writing

INTRODUCTION

Artificial Intelligence (AI) has started making tremendous impact in the education field since the emergence of Generative AI (Morris et al., 1999; He at al., 2016; Jen & Salam, 2024a). Generative AI refers to the generalisation of text, audio and images from the existing data into a new form of data. Studies have shown that Generative AI tools are not only able to produce immediate feedback, personalised response but they are also able to assist learners in self-directed learning (AlAfnan et al., 2023; Pavlik, 2023; Engelmann et al., 2023).

Since there are so many Generative AI tools, there are concerns about which AI tools to choose and the possible side effects of AI tools such as plagiarism, overreliance and hamper of students' critical thinking skills (Buriak et al., 2023; Alharbi, 2023). This study examines the use of Gemini AI, an AI developed by Google, one of the largest communication providers in the world. Gemini is chosen compared to other AI because of its benefits for school students are widely recognised (Jen & Salam, 2024b; Ogunleye et al., 2024). In Malaysia, Gemini is a built-in app in DELIMA. Teachers and students can access Gemini easily in DELIMA, a digital platform built by MOE for Malaysian teachers and students.

In addition, compared to other AI, Gemini is able to generate information in different forms. It has the ability to generate text, audio and images through the prompt keyed in by the users (Team et al., 2023). The variety of information produced by Gemini enables different types of learners to learn. Compared to other Generative AI, Gemini provides differentiation strategies for students' learning. Gemini produces different responses for students' prompts and queries. Students also can choose the type of responses from Gemini for the same question. Thus, Gemini enables different types of learners to learn at their own pace. For example, the advanced students can choose a more difficult text to learn while weaker learners can choose a simpler text. This enables the weak students to comprehend the text while the Higher English Proficiency (HEP) students to learn further on their own using the more difficult texts.

Although there are many studies regarding the benefits of Generative AI for students' learning, there are still lack of studies regarding students' perceptions in using Gemini AI (Ashrafimoghari et al.,2024; Devlin, 2018). Thus, this study examines secondary school students' perceptions regarding the use of Gemini AI.

OBJECTIVES

The Research Objectives (RO) for this study are to examine:

1. secondary school students' Perceived Usefulness (PU) of Gemini
2. secondary school students' Perceived Ease of Use (PEOU) of Gemini

Both Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) originated from Technology Acceptance Model (TAM) developed by Davis (1989).

METHODS

Respondents & Data Collection Instruments

This is a case study carried out on a group of 30 Form 3 students of a secondary school in Johor Bahru. They were 14 and 15 years old male and female students. The students were chosen as they were not sitting for public examination that year and there was still lack of studies carried out on this group of learners (Jen et al., 2023). In addition, Ang et al. (2020) and Mehat and Ismail (2021) asserted that 30 students were deemed necessary for research on students' essay writing. The students were given pre-assessment and their perceptions regarding the use of Gemini AI were collected through several instruments adapted from studies carried out by previous researchers (Khan, 2021; Rose, 2019). The instruments used in this study are participant observation, open-ended questionnaires, journal entries and semi-structured interviews. The data for this study was then analysed qualitatively using thematic analysis and presented under different headings.

Procedures Involved

Since Gemini AI is a newly introduced AI in Malaysian Education System, the researcher had come up with her own framework and module (Bard G) in order to assist students in learning how to write their essay using Gemini. Students were exposed to AI and Gemini AI in July 2024. Students were then given pre-assessment early September 2024. Then, they had hands-on lessons in using Gemini end of September 2024 till November 2024. A post-test was given to students to examine their improvements in essay writing using Gemini AI. However, this paper only discusses the respondents' perceptions regarding the use of Gemini AI and not only students' improvements in using Gemini AI.

Data Analysis

The data for this study was analysed using thematic analysis and the software atlas.ti was used. It was presented under two main headings: Students' Perceived Usefulness (PU) of Gemini and Students' Perceived Ease of Use (PEOU) of Gemini.

Perceived Usefulness (PU) of Gemini

Technology Acceptance Model (TAM) developed by Davis (1989) was used in this study to examine the respondents' Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) towards the use of Gemini. Students' perceptions regarding the use of Perceived Usefulness (PU) of Gemini were collected mainly through open-ended questionnaires and students' journal entries. The findings were then triangulated with findings from observation and semi-structured interviews.

Table 1 below shows the main themes identified through the research instruments.

Table 1 Themes for Perceived Usefulness (PU) of Gemini

Perceived Usefulness (PU) of Gemini (Themes Identified)	Codes
Generalisation of ideas	-Find sample of essays -Give some examples or elaborations for an idea -Search for other format of essay
Assisting students' essay writing	-Introduction: Translate the essay question into students' mother tongue -Elaborating points -Development of ideas in essays (introduction, content, ending) -Identify students' mistakes (word choice, sentence structure, grammar mistakes)
Differentiation strategies	-Draft function

	-HEP students: More professional essay -LEP students: Simpler essay
Personalised learning	-Immediate feedback -check and identify students' errors -Provide suggestions for students' mistakes -Translation (from students' mother tongue into English and vice versa)
Self-directed learning	-Writing practice -Suitable for all types of learners -Immediate response -Learn how to generate own ideas / learn own weaknesses in essay writing

Table 1 above shows Gemini has helped students in various ways such as generalisation of ideas, assisting students in their essay writing, differentiation strategies, personalised learning and self-directed learning. In addition, Gemini also assists students in different stages of essay writing.

Generalisation of Ideas

Firstly, Gemini assists students in terms of generalisation of ideas. Students used Gemini to find sample of essays by keying in the prompt taught by teacher. The ideas given by Gemini provides a starting point for students to start writing instead of giving up and start to sleep when they get the essay question.

Assisting Students' in Their Essay Writing

Apart from that, Gemini assists students in all the three stages of essay writing by giving the introduction, development of ideas and finally identifying students' mistakes such as word choice, sentence structure and grammar mistakes. The main function of Gemini used by students during pre-writing stage is for ideas generation and translating the essay question, while students mainly used Gemini for finding extra information during while writing stage. Finally, during post writing stage, students use Gemini mainly to evaluate and correct the errors in the essay. To sum up, Gemini is a great tool in assisting students in all the different stages of essay writing.

Differentiation Strategy

Moreover, the differentiation strategy feature available in Gemini enables students of different levels of proficiency to learn on their own. Figure 1 below shows different drafts produced by Gemini based on the prompt 'I am a Form 3 student. Give me an essay about A Road Accident'.

Figure 1 Drafts Produced by Gemini

Compared to other AI, Gemini generates a few drafts or different sample of responses for every question asked by the students. Thus, students can look through all the sample answers given by Gemini before deciding which one to use. This also stimulates students' critical thinking skills as they need to evaluate the different samples of responses given by Gemini before choosing the response to be used.

Moreover, students also can modify the type of responses generated in Gemini through the Modify Response function available in Gemini. Figure 2 shows the function of Modify Response available in Gemini.

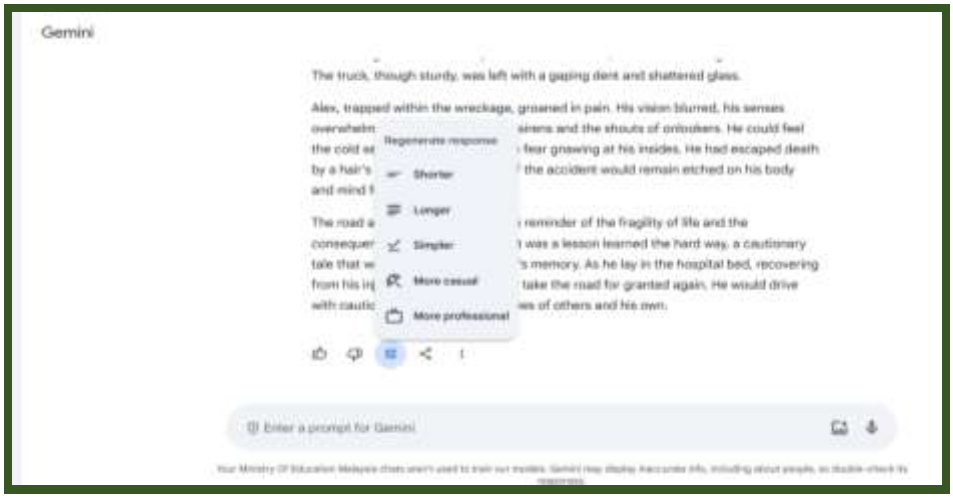

Figure 2 Modify Response Function Available in Gemini

The Modify Response function available only in Gemini enables students of different levels of proficiency to learn further on their own. The Higher English Proficiency (HEP) students can choose more professional essays while the Lower English Proficiency (LEP) students can choose the simpler essay. This feature is not available in other types of Generative AI such as ChatGPT and Copilot.

Personalised Learning

Apart from differentiation strategy, Gemini enables students to receive immediate feedback as Gemini can check and identify students' errors. It then provides suggestions for students' mistakes. It also enables the weaker students to translate from their mother's tongue into English. As found in students' journal entries, one of the main functions of Gemini during post-writing stage is its ability to evaluate students' essays and provide suggestions for students' mistakes.

Self-Directed Learning

Finally, Gemini encourages self-directed learning among students in essay writing through provision of practice for students and immediate response for students' essays. Students learn how to generate own ideas and learn their weaknesses in essay writing through the feedback given by Gemini. Figure 3 shows a sample feedback given by Gemini for students' essay.

Figure 3 Evaluation Generated by Gemini for Students' Essay

Figure 3 shows the evaluation generated by Gemini for students' essay that consists of the strengths and areas of improvement for the essay. Gemini does not only provide evaluation in terms of grammar and word choice used by students, it also provides suggestions of improvement to make the essay better. The findings from interviews revealed that most of the respondents would make a choice on the evaluations provided by Gemini. They did not do all the corrections suggested by Gemini because they wanted to include in their own ideas. Although there are many functions of Gemini in assisting students to write, this article has summarised them into four main themes as discussed above.

Perceived Ease of Use (PEOU) of Gemini

Table 2 below shows students' perceptions regarding Perceived Ease of Use (PEOU) of Gemini. The data for this research question was collected from questionnaires and further supported with findings from students' journal entries and interviews.

Table 2 Students' Perceptions on The Perceived Ease of Use (PEOU) of Gemini

Question	Easy	Difficult	Other Responses	Number of participants
How easy is it to use Gemini?	All stated easy except S8, S13, S14, S15, S16, S29	S8, S13, S14, S15, S16, S29	-A bit difficult but can do (S17) -Very easy (S22) -Gemini is easy to use (S23) -It was quite difficult in the beginning (S26)	Easy = 24 Difficult = 6
How easy is it to become skilful in using Gemini?	All stated easy except S13, S14, S15, S24	S13, S14, S15, S24	-Easy to become skillful in using Gemini (S1) -It's easy to master (S5) -Maybe (S6, S22) -Yes very skillful and my writing also improved (S17) -A bit more skillful (S18) -A bit difficult (S24)	Easy = 25 Difficult = 5
How easy is it to find information using Gemini?	All stated easy except S13, S14, S22	S13, S14, S22	-Easy because I like to use computer (S1) -Yes cause it is easy to use (S2) -Easy to find information (S4, S11) -Easy because AI has fewer sentences and easier (S6) -Find word meaning easy (S17) -Easy, because AI can give information in less than 2 seconds (S21)	Easy = 27 Difficult = 3

Generally, 80% of the students expressed that Gemini is easy to use. Only 6 students expressed that they were having difficulties in using Gemini. Although students' interviews showed that students were having difficulties in using Gemini initially but after taught by teacher the steps in using Gemini they expressed that it was easy to use Gemini. A few students in the interviews expressed that they needed to follow Bard G module and prompts created by teacher in using Gemini. Without the prompt created by teacher, they would not be able to use Gemini. This shows the importance of teachers' guidance while using AI (Jen & Salam, 2024a).

83% of the students stated that it was easy to become skillful in using Gemini. Below are the responses by respondents about the statement on how easy is it to become skillful in using Gemini.

Student 1: It's easy to become skillful in using Gemini

Student 5: It is easy to master Gemini

Student 17: Yes, very skilful and my writing also improved

Finally, 90% of the students expressed that it is very easy to find information using Gemini. Among the responses given by them are easy to use because he likes to use computer (student 1), AI has fewer sentences and easier (student 6), easy to find meaning for words (student 17) and because AI can give information in less than 2 seconds (student 21). Although majority of the students expressed that it is easy to use Gemini, students still need teachers' guidance in using Gemini. In the interviews conducted, students admitted that they would not be able to use Gemini without the prompts taught by the teacher. This is supported by Tze Pheng et al. (2021) who asserted that teachers play an important role in an online learning environment.

DISCUSSION

The findings from this study show that Gemini is indeed a great assistance for second language learners in learning essay writing (Ashrafimoghari et al., 2024; Zheng et al., 2024; Sadıkoğlu et al., 2023) It helps students in different stages of essay writing through generalisation of ideas, searching for information, essay development and errors identification. From the suggestions given by Gemini, students can further improve on their own.

CONCLUSION

In conclusion, this study provides insights for practitioners and teachers in using artificial intelligence to teach essay writing to second language learners of English. Since majority of the students had positive perceptions towards the use of Perceived Usefulness (PU) and Perceived Ease of Use of Gemini (PEOU), more initiatives should be taken by Education Ministry and teachers to introduce the use of Gemini into our education system. As highlighted by Jen et al. (2023), students nowadays are digital nomad. The use of digital tool is necessary not only to assist them in their learning, but it should also be integrated as part of their daily life.

REFERENCES

[1] AlAfnan, M. A., Dishari, S., Jovic, M., & Lomidze, K. (2023). Chatgpt as an Educational tool: Opportunities, challenges, and recommendations for communication, business writing, and composition courses. Journal of Artificial Intelligence and Technology, 3(2), 60-68. https://doi.org/10.37965/jait.2023.0184

[2] Alharbi, W. (2023). AI in the foreign language classroom: A pedagogical overview of automated writing assistance tools. Education Research International, 2023(1), 4253331.

[3] Ang, L. H., Tan, K. H., & Lye, G. Y. (2020). Error Types in Malaysian Lower Secondary School Student Writing: A Corpus-Informed Analysis of Subject-Verb Agreement and Copula be. 3L, Language, Linguistics, Literature, 26(4).

[4] Ashrafimoghari, V., Gürkan, N., & Suchow, J. W. (2024). Evaluating Large Language Models on the GMAT: Implications for the Future of Business Education. arXiv preprint arXiv:2401.02985. https://doi.org/10.48550/arXiv.2401.02985

[5] Buriak, J. M., Akinwande, D., Artzi, N., Brinker, C. J., Burrows, C., Chan, W. C., ... & Ye, J. (2023). Best practices for using AI when writing scientific manuscripts: Caution, care, and consideration: Creative science depends on it. ACS nano, 17(5), 4091-4093.

[6] Chai, A., & Hamid, A. H. A. (2023). The impact of flipped learning on students' narrative writing. International Journal of Advanced Research in Education and Society, 4(4), 159-175.

[7] Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology. MIS quarterly. https://doi.org/10.2307/249008

[8] Devlin, J. (2018). Bert: Pre-training of deep bidirectional transformers for language understanding. arXiv preprint arXiv:1810.04805.

[9] Engelmann, B., Haak, F., Kreutz, C. K., Khasmakhi, N. N., & Schaer, P. (2023). Text Simplification of Scientific Texts for Non-Expert Readers. arXiv preprint arXiv:2307.03569. https://doi.org/10.48550/arXiv.2307.03569

[10] He, K., Zhang, X., Ren, S., & Sun, J. (2016). Deep residual learning for image recognition. In Proceedings of the IEEE conference on computer vision and pattern recognition (pp. 770-778).

[11] Jen, S. L., Salam, A. R., & Ahmed, M. N. A. (2023). Perceptions of secondary school students towards the use Of Wakelet Students' Ambassador Programme. Journal of ICT in Education, 10(2), 13-28. https://doi.org/10.37134/jictie.vol10.2.2.2023

[12] Jen, S. L., & Salam, A. R. H. (2024a). Using Google Bard to Improve Secondary School Students' Essay Writing Performance. Journal of Creative Practices in Language Learning and Teaching (CPLT), 12(1). https://doi.10.24191/cplt.v12i1.24999

[13] Jen, S.L., & Salam, A. R. (2024b). Using Artificial Intelligence for Essay Writing. Arab World English Journal (AWEJ) Special Issue on ChatGPT, April 2024: 90-99. DOI: https://dx.doi.org/10.24093/awej/ChatGPT.5

[14] Khan, M.S. (2021). English Oral Communication Barriers Faced by Arab Medical Students. PhD Dissertation, Universiti Teknologi Malaysia. A: Biomedical Sciences and Medical Sciences, 54(11), M546- M553. DOI: 10.1093/gerona/54.11.m546

[15] Mehat, S. Z., & Ismail, L. (2021). Malaysian tertiary ESL Students' writing errors and their implications on english language teaching. Asian Journal of University Education, 17(3), 235-242.

[16] Morris, J. N., Fries, B. E., & Morris, S. A. (1999). Scaling ADLs within the MDS. Journals of Gerontology Series

[17] Ogunleye, B., Zakariyyah, K. I., Ajao, O., Olayinka, O., & Sharma, H. (2024). A Systematic Review of Generative AI for Teaching and Learning Practice. Education Sciences, 14(6), 636. https://doi.org/10.3390/educsci14060636

[18] Pavlik, J. V. (2023). Collaborating with ChatGPT: Considering the implications of generative artificial intelligence for journalism and media education. Journalism & mass communication educator, 78(1), 84-93. https://doi.org/10.1177/10776958221149577

[19] Rose, H. (2019). Collecting insider perspectives in second language research. The Routledge handbook of research methods in applied linguistics.

[20] Sadıkoğlu, E., Gök, M., Mıjwıl, M. M., & Kösesoy, İ. (2023). The Evolution and Impact of Large Language Model Chatbots in Social Media: A Comprehensive Review of Past, Present, and Future Applications. Veri Bilimi, 6(2), 67-76. İletişim e-posta: emre.sadikoglu@yalova.edu.tr

[21] Team, G., Anil, R., Borgeaud, S., Wu, Y., Alayrac, J. B., Yu, J., ... & Ahn, J. (2023). Gemini: a family of highly capable multimodal models. arXiv preprint arXiv:2312.11805.

[22] Tze Pheng, K., Hashim, H., & Ainil Sulaiman, N. (2021). The use of technology in teaching of writing among Malaysian ESL secondary school teachers. Arab World English Journal (AWEJ) Special Issue on CALL, (7).

[23] Zheng, L., Fan, Y., Chen, B., Huang, Z., LeiGao, & Long, M. (2024). An AI-enabled feedback-feedforward approach to promoting online collaborative learning. Education and Information Technologies, 29(9), 11385-11406. https://doi.org/10.1007/s10639-023-12292-5