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The Effect of E-Portfolio Combined with AI on Undergraduate Students' EFL Self-Efficacy Regarding Speaking Skills

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ABSTRACT

Speaking ability and lack of self-efficacy are common issues faced by English as a Foreign Language (EFL) learners. However, technological advancements such as artificial intelligence (AI) and e-portfolios can assist in the development of their speaking skills and self-efficacy. Currently, there has been limited research investigating the integration of e-portfolios with AI-based personal feedback facilities in the context of students' speaking abilities and self-efficacy. This study has explored the role of e-portfolios combined with AI in the cognitive development of students' speaking abilities and self-efficacy. Using a quantitative approach, this research has examined the impact of e-portfolios combined with AI on second-semester students in Indonesia. Data were collected through speaking tests and questionnaires, and were analyzed using statistical analysis, specifically descriptive statistics and one-way MANOVA. The research results have shown that e-portfolios significantly improve speaking skills through repetitive practice, self-assessment, and feedback from AI. However, in the context of self-efficacy, it has not yet shown a significant impact. This study provides insights for educators that e-portfolios combined with AI are effective tools for improving speaking skills, and the AI feedback mechanism can further enhance students' oral abilities.

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INTRODUCTION

Speaking ability is a crucial skill among the four essential abilities for foreign language learners, as communication is vital for achieving success in today's world (Rao, 2019). Speaking ability is a very important aspect for EFL students because it will support the delivery of information and communication in various ways (Sirisrimangkorn, 2021). However, EFL students face many challenges in developing their speaking performance. According to Chen et al. (2021), EFL students find it difficult to develop their speaking performance due to a lack of opportunities to use it and differences in pronunciation compared to their native language. Additionally, students must also master five components of speaking. These components are comprehension, grammar, fluency, pronunciation, and vocabulary (Harmer, 2007). In Indonesia, English is a foreign language where students will find it very difficult to develop their speaking skills due to the lack of a supportive environment to practice their English speaking abilities. Despite this, technology is now widely integrated into education, including helping with learning in the context of

speaking. Technological developments such as mobile phone applications, online learning platforms, and video and audio recording facilities provide opportunities for improving English language learning (Rofi'I & Syarifah, 2024). E-portfolios, as one of the technological developments, are an innovative step in the field of education (Al Hawamdeh et al., 2023). In the concept of education, according to Huang and Hung (2010), an electronic portfolio or e-portfolio is a multimedia environment where students can showcase their artwork and ideas. An e-portfolio refers to a digital collection of students' work, academic achievements, and professional competencies (Zheng & Barrot, 2022). Previously, paper portfolios were known for their usefulness in storing students' learning outcomes and works as a form of learning results. Now, with the times, students' work is compiled and stored in electronic and online formats that better support various file formats. Additionally, according to Huang and Liang (2021), the use of e-portfolios can help teachers easily monitor student progress, as e-portfolios contribute to observing students' abilities over time, providing insights and information related to learning, and ensuring that the communication methods used are effective. Then, e-portfolio assessment also provides feedback activities through self-assessment and peer assessment. However, traditional feedback methods have several issues, including a lack of personalization for students, which leads to very slow performance improvement, limited feedback opportunities outside the classroom, and feedback that tends to be general and therefore does not fully meet students' needs. With the rapid advancement of technology, feedback can also be provided by AI (Artificial Intelligence). The potential that AI currently possesses will certainly be very helpful in education. Currently, there are many educational technologies that incorporate AI, such as Duolingo and ELSA Speak, where users can personalize their learning, including practicing speaking skills and receiving instant feedback on their speaking abilities (Farida et al., 2024). This aligns with Indrayani et al. (2025) who stated that AI-based applications such as ELSA Speak can provide comprehensive real-time feedback with students can practice anywhere and anytime and support independent learning. This helps students refine their speaking skills even outside the classroom (Anh, 2024). This effectiveness is one of the factors supporting the success of learning, especially in English language learning as a foreign language (Kusuma et al., 2021), particularly in speaking skills.

Within the scope of EFL, a student's confidence in speaking English often faces challenges in improving their speaking ability. To overcome this, students need to be aware of the importance of developing or improving their speaking abilities. This desire to grow into something better is related to students' confidence in their abilities. A person's self-confidence or belief in their ability to complete a task is called self-efficacy (Bandura, 1997). In the academic aspect, Bandura (1997) states that self-efficacy is a student's belief in their ability to perform tasks or work related to learning. This relates to students' thoughts, emotions, and actions, where students determine what they should pursue, how much effort they put in, and their persistence in overcoming obstacles when completing a task (Almohammadi, 2023). Bandura (1997) also identified four sources of self-efficacy, explaining how a person's belief in their ability to achieve certain goals can be formed and improved. These sources are: 1) mastery experience, where individuals achieve success in solving problems, leading to an increase in their self-efficacy, and conversely, failure to solve problems results in a decrease in self-efficacy; and 2) vicarious experiences, where an individual's self-efficacy can also increase by observing others who share similar feelings. This is because the other person serves as an intermediary factor or observable 'model,' providing an example in action and demonstrating effective strategies for solving a problem. (3) Social persuasion is a situation where people receive encouragement from others about their ability to do something. This will help individuals increase their self-efficacy toward something. However, the impact of this source is limited if they do not have great trust in other people (sources) and choose to stick to their stance regarding their self-efficacy. (4) Physiological and emotional states: If a person has a weak physique or is tired, their self-efficacy will decrease, as will if their emotions are not good. Positive physical and emotional states for each person will greatly affect their self-

efficacy. Through e-portfolios, it is possible to improve all four sources of self-efficacy, as Huang and Hung (2010) found that using e-portfolios can reduce students' speaking anxiety. As we know, in an e-portfolio, students receive feedback from both peers and instructors, which allows for encouragement to improve students' self-efficacy.

Several studies have explored the use of e-portfolios on speaking ability and their use in improving self-efficacy. Zheng and Barrot (2022) investigated the effects of using the social media platform QQ as an e-portfolio on speaking ability, showing that its attractive features and high student visibility led to improvements in students' speaking skills, motivation, engagement, and confidence. Cabrera-Solano (2020) reflects similar results, stating that in addition to helping improve confidence and speaking abilities such as grammar, pronunciation, vocabulary, and fluency, e-portfolios (Google Drive) also assist instructors in monitoring student progress, and students can identify their weaknesses and strengths, as well as areas for improvement, thanks to the large storage capacity provided by e-portfolios. Ismail and Manaf (2020), in their research using vlog portfolios with non-native speaker students, also found a positive effect on improving students' speaking abilities, especially in providing feedback. Students felt comfortable with the support of their peers and experienced reduced anxiety. Additionally, similar to previous research, this study also found that student participation increased with the implementation of portfolio vlogs that focused on student independence and responsibility in learning, thus fostering learning autonomy.

Huang and Hung (2010) implemented an e-portfolio with positive results, including increased student self-efficacy, which reduced feelings of shyness and boosted student confidence. Furthermore, Kusuma and Waluyo (2023) also conducted research on this topic with students at a university in Indonesia during the COVID-19 pandemic. Beside reducing feelings of embarrassment, the results show that students' self-efficacy increased through the engaging activities found in the e-portfolio, peer comments helped them improve their abilities, and self-reflection helped students identify their strengths and weaknesses. Furthermore, in line with research by Kusuma and Waluyo, Laksana et al., (2021) also found the same thing, with the main reason for this increase in self-efficacy being the provision of feedback and opportunities to interact or communicate with friends and instructors in carrying out tasks. Additionally, another finding is that e-portfolios facilitate students' independent learning, allowing them to design their own learning processes.

However, in some studies, AI as feedback tends to be used in the context of writing. AI provides detailed feedback on clarity, coherence, grammar, and vocabulary by analyzing student texts, which also leads to deeper student engagement with the learning content (Campos, 2025). Beside writing ability, AI is also integrated into other contexts. Wei’s (2023) research found that integrating AI can improve speaking performance, reading ability, and foster motivation and self-regulated learning, which aligns with Huang et al. (2022) who stated that AI not only facilitates feedback but also provides phrase and structure suggestions that students can use, thereby enriching students' learning experiences and boosting their confidence.

With the advancement of technology, the use of technology in education is no longer something uncommon. In line with that, teachers in Indonesia have a high interest in using e-portfolios (Taufik & Cahyono, 2019; Subiana, 2022). In addition, the interest in using AI for English in Indonesia is also high (Rafida et al., 2024; Rahman, 2024). However, the literature on the integration of e-portfolios with AI remains unclear. Therefore, it is important to determine the extent to which e-portfolios and AI can facilitate students' self-efficacy in English speaking skills.

Therefore, this study aims to investigate the use of e-portfolios combined with AI in improving the self-efficacy and speaking skills of EFL students. The focus is on the use of AI in providing feedback on students' speaking video recordings. Subsequently, it seeks to answer two questions: (1) Is there any significant effect of e-portfolios combined with AI on EFL students' self-efficacy? (2) Is there any significant effect of e-portfolios combined with AI on EFL students' speaking performance? Furthermore, this study is innovative in that it combines e-portfolios with

AI and is conducted on EFL students.

METHOD

This study adopted a quantitative design using a quasi-experimental approach. The experimental design was chosen because this study involved treatment administered to research subjects with the aim of analyzing whether an activity or material could influence the participants' outcomes (Sugiyono, 2013). This design consists of a control group and an experimental group, and the researcher does not have full control over the randomization of research subjects (Campbell & Stanley, 1963). In this study, it was evaluated whether the integration of e-portfolios with artificial intelligence (AI) affects the self-efficacy and speaking skills of English as a foreign language (EFL) students. The feedback section of the e-portfolio served as the place for AI integration. Students presented their work to the AI and asked the AI to provide comments on their videos, then students reflected on their performance. The YouTube app is used in this study's e-portfolio for storing student artifacts. After that, students provided feedback to their peers using the comment box for the control group, while the experimental group used AI to provide feedback. Following that, the Google Drive platform was used to upload student reflections. The control group only received a pre-test, e-portfolio use without AI, and a post-test. Meanwhile, the experimental group received a pre-test, treatment with AI integration, and a post-test at the conclusion. Prior to hypothesis testing, the pre-test was administered to both groups as a preliminary condition.

This study was conducted on second-semester English as a Foreign Language (EFL) students at the University of Education in Indonesia. Since the students are currently enrolled in a speaking course, already have basic speaking skills in English, and are currently enrolled in the "Speaking for Social Interaction" course. The participants in this study were second-semester students aged 18–19 who had studied English for over six years. Based on initial observations, their English proficiency level is at B1 CEFR, where they are able to produce simple texts and describe events. The experimental group using AI consisted of 27 students (5 male and 22 female), while the control group without AI consisted of 26 students (6 male and 20 female). Then, the sample selection was done using intact group sampling, which involves using existing groups of participants since the researcher could not randomize the sample and only used the available classes.

Testing and surveys are used in this study. Testing was conducted using a speaking test instrument, where this study considered findings and recommendations from relevant previous research, particularly in the context of EFL speaking instruction, adopting the approach by Kusuma and Waluyo (2023). This speaking test will be in the form of a monologue where students choose one of the topics provided by the researcher and will talk about the topic for 3 minutes and their speaking performance was assessed using a scoring rubric from Brown (2004) which includes aspects of comprehension, grammar, fluency, pronunciation, and vocabulary. Next, the survey was conducted using a questionnaire instrument to measure students' self-efficacy. Researchers distributed questionnaires via Google Forms. This instrument adopts the self-efficacy questionnaire from Asakereh and Dehghannezhad (2015) with a scale of one (strongly disagree) to five (strongly agree). The questionnaire consists of 28 questions related to students' self-efficacy in speaking. The questions cover students' beliefs and confidence in their ability to improve their English speaking skills. Since both instruments have been adopted and used by many studies, researchers do not need to test their consistency and validity.

Table 1. Treatment

Meetings	Topics	Experimental Group (AI-Based Feedback)	Control Group (Peer Feedback via Comments)
1st meeting	Pre-test	Pre-test	Pre-test
2nd meeting	Family	1. Reviewing materials 2. Practicing 3. Recording video (max. 5 minutes) 4. Uploading on YouTube	1. Reviewing materials 2. Practicing 3. Recording video (max. 5 minutes) 4. Uploading on YouTube
3rd meeting	Reflection	1. Receiving feedback from AI 2. Writing self-reflection based on AI feedback	1. Reading peers' comments on YouTube 2. Writing self-reflection based on peer feedback
4th meeting	Friendship	1. Reviewing materials 2. Practicing 3. Recording video (max. 5 minutes) 4. Uploading on YouTube	1. Reviewing materials 2. Practicing 3. Recording video (max. 5 minutes) 4. Uploading on YouTube
5th meeting	Reflection	1. Receiving feedback from AI 2. Writing self-reflection based on AI feedback	1. Reading peers' comments on YouTube 2. Writing self-reflection based on peer feedback
6th meeting	Hometown	1. Reviewing materials 2. Practicing 3. Recording video (max. 5 minutes) 4. Uploading on YouTube	1. Reviewing materials 2. Practicing 3. Recording video (max. 5 minutes) 4. Uploading on YouTube
7th meeting	Reflection	1. Receiving feedback from AI 2. Writing self-reflection based on AI feedback	1. Reading peers' comments on YouTube 2. Writing self-reflection based on peer feedback
8th meeting	Celebration	1. Reviewing materials 2. Practicing 3. Recording video (max. 5 minutes) 4. Uploading on YouTube	1. Reviewing materials 2. Practicing 3. Recording video (max. 5 minutes) 4. Uploading on YouTube
9th meeting	Reflection	1. Receiving feedback from AI 2. Writing self-reflection based on AI feedback	1. Reading peers' comments on YouTube 2. Writing self-reflection based on peer feedback
10th meeting	Festival	1. Reviewing materials 2. Practicing 3. Recording video (max. 5 minutes) 4. Uploading on YouTube	1. Reviewing materials 2. Practicing 3. Recording video (max. 5 minutes) 4. Uploading on YouTube
11th meeting	Reflection	1. Receiving feedback from AI 2. Writing self-reflection based on AI feedback	1. Reading peers' comments on YouTube 2. Writing self-reflection based on peer feedback
12th meeting	Post-test	Post-test	Post-test

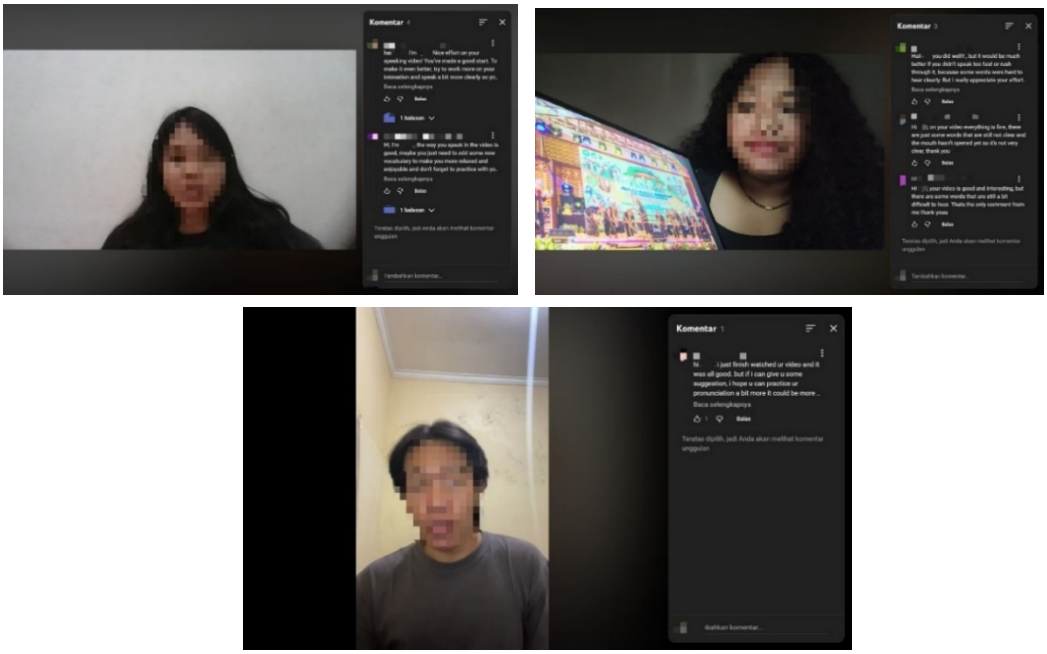

Figure 1. Participants' Videos and Comments on YouTube in the Control Group

Peer/AI Feedback	Areas for Potential Improvement (Focusing on English Language Skills): * Pronunciation Clarity: * While the conversation is understandable, some words could benefit from clearer pronunciation. This is especially important for English education students. * It is not bad, but it can be improved. * Grammatical Accuracy: * In casual conversation, minor grammatical errors are common. However, for those studying English, paying closer attention to accuracy would be beneficial. * Focusing on correct tenses, and sentence structure will be very helpful. * Vocabulary Expansion: * The vocabulary used is basic. Expanding vocabulary would enhance the richness of the conversation. * Using more descriptive words would be good. * Fluency and Pauses: * While natural pauses are fine, reducing excessive "um"s and "uh"s would improve fluency. * Practicing speaking more smoothly would be helpful.
Your opinion/comments to the feedback	I agree with the points about pronunciation clarity, grammatical accuracy, and vocabulary expansion. These are areas I will focus on for improvement. I realize that I need to work on fluency and reduce pauses. I will practice more to enhance this aspect. This feedback is very valuable to me as an English education student. I will use this advice to improve my language skills.
Improvements	Improvements Planned: * Pronunciation: * Identify unclear words and practice them using online dictionaries with audio. * Grammar: * Focus on common error areas. * Vocabulary: * Use flashcards or language apps to memorize new words. * Fluency: * Practice speaking daily, even for short periods. * Speak slower to reduce fillers ("um," "uh"). * Focus on clear, regular pronunciation. * Record and analyze speech to identify unnecessary pauses.

Figure 2. An Example of Participants' Reflections in the Experimental Group

Descriptive statistics and one-way MANOVA were used in the data analysis of this study. Descriptive analysis includes minimum and maximum values, variance, range, standard deviation, and mean. One-way MANOVA is used because this study has two dependent variables and is suitable for measuring two or more dependent variables. Then, SPSS 25 for Windows was used for quantitative analysis. Before conducting post-test analysis, assumption tests were performed, including normality tests and homogeneity tests. However, the results of the homogeneity assumption test indicate that the speaking and self-efficacy scores are not normal. Therefore, data analysis was conducted using one-way MANOVA, considering the "Pillai's Trace" line which is robust against invalid homogeneity since the homogeneity assumption for speaking and self-efficacy scores was not met. This is supported by the study by Ateş et al. (2019) who stated that the Pillai's Trace test statistic is best in cases where the homogeneity assumption is not met. Nevertheless, before analyzing the post-test and as a data reinforcement, the researchers conducted a prerequisite test using a one-way MANOVA on the pre-test scores of both groups, for both speaking and self-efficacy. This pre-test aimed to determine whether the two groups were equivalent from the beginning before the treatment was given. The results of the prerequisite test showed that the two groups did not have significant differences ($p > 0.05$) or were equivalent.

FINDINGS AND DISCUSSION

Findings

Table 2. Descriptive Statistics

Descriptive Statistics								
Groups	Scores	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Experimental	Speaking	27	7.00	77.00	84.00	80.7778	2.08167	4.333
	Self-Efficacy	27	62.00	71.00	133.00	104.8148	17.56972	308.695
Control	Speaking	27	20.00	70.00	90.00	77.5556	5.04086	25.410
	Self-Efficacy	27	102.29	50.71	153.00	98.6296	23.77799	565.393

Table 2 shows that for the speaking variable, the experimental group obtained a mean score of 80.78 with a standard deviation of 2.08, while the control group had a mean of 77.56 with a standard deviation of 5.04. For the self-efficacy variable, the experimental group obtained a mean of 104.81 with a standard deviation of 17.57, while the control group had a mean of 98.63 with a standard deviation of 23.78. Based on the descriptive statistics table, the experimental group showed a better score distribution compared to the control group, both in the speaking and self-efficacy variables. The hypothesis test in this study was conducted using a Multivariate Test and can be seen in the table below.

Table 3. Multivariate Tests

Multivariate Tests							
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.998	11883.703	2.000	51.000	.000	.998
	Wilks' Lambda	.002	11883.703	2.000	51.000	.000	.998
	Hotelling's Trace	466.028	11883.703	2.000	51.000	.000	.998
	Roy's Largest Root	466.028	11883.703	2.000	51.000	.000	.998
Group	Pillai's Trace	.171	5.261	2.000	51.000	.008	.171

Wilks' Lambda	.829	5.261	2.000	51.000	.008	.171
Hotelling's Trace	.206	5.261	2.000	51.000	.008	.171
Roy's Largest Root	.206	5.261	2.000	51.000	.008	.171

a Design: Intercept + Group

b Exact statistic

The analysis of significant values focusing on Pillai's Trace (V = 0.171, F(2, 51) = 5.26, p = 0.008, η^2p = 0.171) shows a significant effect on speaking skill and self-efficacy between the experimental group and the control group.

Table 4. Tests of Between-Subjects Effects

Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Post_SP	140.167	1	140.167	9.425	.003	.153
Post_SE	516.463	1	516.463	1.182	.282	.022

Furthermore, Table 4 shows that there is a statistically significant difference between the speaking scores of participants in the experimental and control groups with F(1) = 9.425, p < 0.003, partial η2 = 0.153. Additionally, Table 2 shows that participants in the experimental group (M = 80.7778) outperformed those in the control group (M = 77.5556) on the post-speaking test. This means that the e-portfolio significantly improved the participants' speaking scores. Table 4 shows no statistically significant difference in self-efficacy between participants in the experimental and control groups with F(1) = 1.182, p > 0.282, partial η2 = 0.022. However, as shown in Table 2, participants in the experimental group (M = 104.8148) outperformed the control group (M = 98.6296) on the post-self-efficacy test. Although the mean is higher, the difference is not statistically significant due to the large score variation.

Table 5. Paired Sample Test

	Mean	Std. Dev	t	df	Sig. (2-tailed)
Pretest Speaking – Posttest Speaking	-5.70370	1.99644	-14.845	26	.000

Following that, Table 5 shows that there is a significant improvement in the experimental group in the context of speaking skills as seen from the pre-test and post-test scores t(26) = -14.85, p < 0.001. The post-test scores are clearly substantially greater than the pre-test scores.

Discussion

This study aims to investigate the effects of e-portfolios combined with AI on the speaking ability and self-efficacy of EFL students. Statistical analysis indicates that there are differences between the control group and the experimental group, supported by mean scores. E-portfolio combined with AI has a significant influence on students' speaking abilities, consistent with previous research findings (Laksana, 2021; Gou & Li, 2024).

The cause of this improvement is due to the regular practice carried out by students through e-portfolios. This allows students to practice regularly and repeatedly, leading to the development of their skills. This result is consistent with Nazarieh and Beigzadeh (2025) who stated that the

improvement in English fluency is achieved through regular practice and engagement in an English-speaking environment. This is in line with previous research by Cabrera-Solano (2020) who found that using digital portfolios, students can practice speaking as learners 'learn by doing' by continuously recording their videos and actively seeking opportunities to improve their skills, which indirectly also helps in the development of self-confidence. Kusuma et al. (2021) also found the same thing, that the improvement in students' speaking performance can be achieved through regular practice, feedback, and self-assessment facilitated by e-portfolios.

The improvement in students' English proficiency also comes from self-assessment and self-reflection obtained through students observing the process of their abilities developing over time. Through this, students can self-evaluate by identifying their weaknesses, allowing them to seek strategies to enhance their skills. This finding aligns with Huang and Hung (2010) who stated that e-portfolios help students see their abilities by providing space for them to practice speaking and identify their weaknesses without feeling anxious. Previous research by Liping et al. (2023) found that the use of e-portfolios as an assessment helps students improve their speaking skills through self-reflection activities, which enable students to understand their errors and improve areas they feel are lacking, and the implementation of self-reflection in their learning process, which will later be related to their learning outcomes. Furthermore, self-reflection and self-assessment are obtained by students through personalized feedback from AI on their speaking videos, providing detailed explanations so that students can identify areas that need improvement. Additionally, the findings of this study are also consistent with Zou et al. (2023), who stated that AI assists in improving students' speaking abilities through personalized and immediate feedback, overcoming the shortcomings of traditional speaking training. Subsequently, AI combined with e-portfolios in the feedback section is also consistent with previous research. Ahyarudin and Jamilah (2024) in their research found that AI assists in personalizing learning, acts as a supervisor providing quick support and feedback, and supports independent and anytime learning in improving students' speaking abilities. Additionally, Ridwan (2025) also found the same in his research, and AI enabled them learn to speak more engagingly and interactively by using the various types of feedback they received from the beginning of their progress to the end of the process, and identify recurring errors in their speaking videos.

In self-efficacy, statistically, there is no significant influence. However, there is an increase when viewed from the mean value. One possible reason is that self-efficacy is a relatively stable psychological construct and does not easily change in a short period of time. Unlike speaking ability, which can improve by practice and direct experience, self-efficacy develops through repeated mastery experiences, vicarious experiences, social persuasion, and emotional regulation based on Bandura (1997). In line with what Hardy (2014) stated, which is an individual who has experienced failure in a performance will directly affect their self-efficacy, making it very vulnerable and slow to develop if rebuilt by repeated successful experiences. This statement is supported by the research of Sembiring et al. (2025), who found that students who are already accustomed to speaking tasks and are consistent will find it easier to improve their self-efficacy compared to students who are still adapting to speaking tasks. It was also found that when students see their peers succeed in completing tasks, they will be motivated to achieve success as well. From the research, students cannot directly increase their self-confidence like speaking skills because students tend to adapt more slowly, and there is a possibility of influence from their surrounding environment to cultivate self-efficacy. Aligned with Mulyanto et al. (2022) also found that 'peer modeling' is a strong strategy, with students seeing their peers confidently speaking English in various aspects such as accent, fluency, and spelling, which will encourage individuals to bravely showcase their abilities. Additionally, insufficient duration and intensity also clearly affect the development of self-efficacy. Interventions with adequate duration will help significantly improve self-efficacy and have long-lasting effects. In contrast, interventions with insufficient duration may lead to some improvement, but not significantly, and thus tend to be short-lived. In accordance with Gueroni (2023), who stated that the effectiveness of interventions

affects the strengthening of self-efficacy, the optimal duration is 8-12 weeks with weekly sessions of 45-60 minutes plus homework, promoting behavioral change through psychoeducation and practice.

CONCLUSIONS

This study highlights the influence of e-portfolios combined with AI on the speaking ability and self-efficacy of EFL students. Through the e-portfolio treatment, where students recorded their speaking videos and combined AI as a feedback facility on the students' speaking videos, students showed an improvement in their speaking ability. Based on the findings, it can be concluded that e-portfolio combined with AI is a good learning strategy to improve students' speaking skills. However, the treatment of e-portfolio combined with AI in this study has not yet proven to have a significant impact on students' self-efficacy. However, the e-portfolio combined with AI tends to have a positive influence, even though it is not statistically significant. Due to the small and limited sample size without randomization, the results of this study cannot be directly generalized to different educational contexts. Further research needs to investigate the impact of e-portfolios combined with artificial intelligence (AI) more specifically on students' self-efficacy with a more diverse range of participation numbers and education levels, as well as the possibility of implementation focusing on areas other than just speaking and self-efficacy.

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REFERENCES

Ahyarudin, D. A., & Jamilah. (2024). Enhancing students' speaking skills: The impact of AI-based instructional tasks in the genre-based approach. *Formosa Journal of Sustainable Research, 3*(9), 2019–2032. https://doi.org/10.55927/fjsr.v3i9.11506

Almohammadi, M. (2023). A decade of EFL self-efficacy research: Empirical status and future directions. *English Language Teaching, 16*(7), 91–101. https://doi.org/10.5539/elt.v16n7p91

Anh, N. H. (2024). Harnessing AI-based tools for enhancing English speaking proficiency: Impacts, challenges, and long-term engagement. *International Journal of AI in Language Education, 1*(2). https://journal.formosapublisher.org/index.php/ijal

Ateş, C., Kaymaz, Ö., Kale, H. E., & Tekindal, M. A. (2019). Comparison of test statistics of nonnormal and unbalanced samples for multivariate analysis of variance in terms of Type-I error rates. *Computational and Mathematical Methods in Medicine, 2019*, Article 2173638. https://doi.org/10.1155/2019/2173638

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191–215. https://doi.org/10.1037/0033-295X.84.2.191

Brown, H. D. (2007). *Teaching by principles: An interactive approach to language pedagogy* (3rd ed.). Pearson Longman. https://books.google.com

Cabrera-Solano, P. (2020). The use of digital portfolios to enhance English as a foreign language speaking skills in higher education. *International Journal of Emerging Technologies in Learning (iJET), 15*(24), 159–172. https://doi.org/10.3991/ijet.v15i24.15163

Duyen, N. N. T., & Vy, L. T. M. (2023). Implementing e-portfolios in English speaking assessment: Vietnamese students' perspectives. *AsiaCALL Online Journal, 14*(2), 98–117. https://asiacall.info/acoj

Farida, S., Ikram, A., & Iness, B. (2024). *Investigating the effectiveness of using artificial intelligence (AI) mobile applications, ELSA Speak, to enhance listening and speaking proficiency* [Doctoral dissertation, Université Kasdi Merbah-Ouargla]. https://dspace.univ-ouargla.dz

Gueroni, L. P. B., Pompeo, D. A., Eid, L. P., Ferreira Júnior, M. A., Sequeira, C. A. D. C., & Lourenção, L. G. (2023). Interventions for strengthening general self-efficacy beliefs in college students: An integrative review. *Revista Brasileira de Enfermagem, 77*(1). https://doi.org/10.1590/0034-7167-2022-0662

Hardy, J. H., III. (2014). Dynamics in the self-efficacy–performance relationship following failure. *Personality and Individual Differences, 71*, 151–158. https://doi.org/10.1016/j.paid.2014.07.014

Harmer, J. (2007). *The practice of English language teaching* (4th ed.). Longman. https://books.google.com

Huang, C. M., & Liang, T. H. (2021). Exploring the effects of using e-portfolios on students' learning performance and reflection. *Interactive Learning Environments, 29*(6), 882–899. https://doi.org/10.1080/10494820.2019.1636077

Huang, H. T. D., & Hung, S. T. A. (2010a). Effects of electronic portfolios on EFL oral performance. *Asian EFL Journal, 12*(2), 192–212. https://asian-efl-journal.com

Huang, H. T. D., & Hung, S. T. A. (2010b). Implementing electronic speaking portfolios: Perceptions of EFL students. *British Journal of Educational Technology, 41*(5), 84–88. https://doi.org/10.1111/j.1467-8535.2009.00996.x

Indrayani, L., Pratiwi, N. P. A., & Arthana, I. K. R. (2025). ELSA Speak as a speaking partner: A mixed methods study in an Indonesian higher education context. *Journal of Education and Teaching (JET), 6*(2). https://ejournal.undiksha.ac.id

Kusuma, I. P. I., & Waluyo, B. (2023). Enacting e-portfolios in online English-speaking courses: Speaking performance and self-efficacy. *Iranian Journal of Language Teaching Research, 11*(1), 75–95. https://doi.org/10.30466/ijltr.2023.121395

Kusuma, I. P. I., Mahayanti, S., Adnyani, L. D. S., & Budiarta, R. (2021). Incorporating e-portfolio with flipped classrooms: An in-depth analysis of students' speaking performance and learning engagement. *The JALT CALL Journal, 17*, 93–111. https://doi.org/10.29140/jaltcall.v17n1.340

Laksana, I. P. Y., Yuliantini, N. N., Suciani, N. K., Purandina, I. P. Y., & Boyce, G. P. (2021). Employing e-portfolio based learning in improving self-efficacy of student's speaking ability. *Journal of Applied Studies in Language, 5*(2), 229–236. https://doi.org/10.31940/jasl.v5i2.2290

Liping, Q., Abu Hassan, S. A., & Yiping, X. (2023). The impact of e-portfolio assessment implementation on polytechnic students' speaking proficiency and self-reflection on learning business English. *Tell: Teaching of English Language and Literature Journal, 11*(2). https://doi.org/10.30651/tell.v11i2.15084

Manca, S. (2020). Snapping, pinning, liking or texting: Investigating social media in higher education beyond Facebook. *The Internet and Higher Education, 44*. https://doi.org/10.1016/j.iheduc.2019.100707

Mulyanto, H., Azizam, E. S. H. B., & Jusoh, J. (2022). Self-efficacy of Indonesian EFL learners in speaking English. *International Journal of English and Applied Linguistics, 2*(3). https://doi.org/10.47709/ijeal.v2i3.1820

Nazarieh, M., & Beigzadeh, A. (2025). Strategies deployed by EFL learners to improve their speaking fluency: An overview. *International Journal of Language and Linguistics, 13*(1), 7–10. https://doi.org/10.11648/j.ijll.20251301.12

Rafida, T., Suwandi, S., & Ananda, R. (2024). EFL students' perception in Indonesia and Taiwan on using artificial intelligence to enhance writing skills. *Jurnal Ilmiah Peuradeun, 12*(3), 987. https://doi.org/10.26811/peuradeun.v12i3.1100

Rahman, M. A. (2024). Exploring the integration of artificial intelligence in English as a foreign language education in Indonesia. *Pedagogy: Journal of English Language Teaching, 12*(2). https://doi.org/10.32332/joelt.v12i2.8501

Rao, P. S. (2019). The importance of speaking skills in English classrooms. *Alford Council of International English & Literature Journal (ACIELJ), 2*(2). https://www.acielj.com

Ridwan, S. C. (2025). Pemanfaatan AI dalam pembelajaran speaking bahasa Inggris: Upaya meningkatkan kepercayaan diri dan konsistensi belajar mahasiswa. *Karimah Tauhid, 4*(9). https://ojs.unida.ac.id

Sembiring, B. D. B., Kusuma, I. P. I., & Indrayani, L. (2025). Exploring cognitive development through speaking: How do e-portfolios strengthen speaking skills? *Journal of Psychology and Instruction, 9*(1), 1–8. https://ejournal.undiksha.ac.id

Sirisrimangkorn, L. (2021). Improving EFL undergraduate learners' speaking skills through project-based learning using presentation. *Advances in Language and Literary Studies, 12*(3). https://doi.org/10.7575/aiac.alls.v.12n.3p.65

Subiana, I. P., Sukyadi, D., & Purnawarman, P. (2022). Using Flipgrid as electronic portfolio in speaking assessment. *POLYGLOT: Jurnal Ilmiah, 18*(2), 187–202. https://doi.org/10.19166/pji.v18i2.4517

Sugiyono. (2013). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Alfabeta. https://books.google.com

Taufik, M., & Cahyono, B. (2020). Developing EFL students' writing skill through self-assessment integrated with e-portfolio. *Indonesian Journal of English Education (IJEE), 7*(2), 171–186. https://doi.org/10.15408/ijee.v7i2.17759

Wei, L. (2023). Artificial intelligence in language instruction: Impact on English learning achievement, L2 motivation, and self-regulated learning. *Frontiers in Psychology, 14*. https://doi.org/10.3389/fpsyg.2023.1144903

Zheng, Y., & Barrot, J. S. (2022). Social media as an e-portfolio platform: Effects on L2 learners' speaking performance. *Language Learning & Technology, 26*(1), 1–19. https://doi.org/10.10125/73474