

AI-Integrated Project-Based Learning for Speaking Skill Development in ESP Communication Classes Among Information System Students

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Abstract: The integration of artificial intelligence (AI) in language learning has gained increasing attention, particularly in English for Specific Purposes (ESP) classrooms. This study explored Information Systems students' perceptions and experiences of AI-assisted Project-Based Learning (PBL) in ESP speaking activities. A qualitative descriptive design was employed involving 45 second-semester Information Systems students at Universitas Bina Sarana Informatika. Data were collected through open-ended questionnaires and analyzed using thematic analysis adapted from Braun and Clarke (2006). The findings revealed that students perceived AI tools, including ChatGPT, Google Gemini, and ELSA Speak, as helpful learning assistants for supporting idea development, script organization, vocabulary enrichment, grammar revision, pronunciation practice, and presentation preparation. Students also reported that AI-assisted PBL provided opportunities for speaking practice and confidence building. Additionally, participants demonstrated awareness of responsible AI use. The findings suggest that AI-assisted PBL can support a more interactive and student-centered ESP speaking environment in higher education.

Keywords: *Artificial Intelligence, Project-Based Learning, English for Specific Purposes, Speaking Skills, Student Perceptions.*

INTRODUCTION

English for Specific Purposes (ESP) plays an important role in preparing students to communicate effectively within their academic disciplines and future professional fields. For Information Systems students, English is particularly important because they are expected to understand technical concepts, communicate digital information, and present project outcomes in international and professional contexts. Hutchinson and Waters (1987) explained that ESP is designed to address learners' specific needs based on their academic fields and career requirements. Therefore, ESP learning for Information Systems students should focus not only on general language skills but also on discipline-specific communication, including technical terminology, explanations of concepts, and professional presentations.

At Universitas Bina Sarana Informatika, the English 2 course for Information Systems students incorporates ESP materials related to Information Systems, including technical vocabulary and communication practices. Unlike general English courses that primarily emphasize basic grammar and everyday communication, ESP requires students to engage with language that is relevant to their academic and professional fields. Through ESP learning, students are expected to develop the ability to understand, explain, and communicate Information Systems concepts using appropriate English expressions.

Speaking Challenges in ESP Communication Classes

Although ESP provides opportunities for students to develop discipline-specific communication skills, many Information Systems students still experience difficulties in speaking activities. Classroom observations indicate that students often face challenges in understanding technical terminology, pronouncing Information Systems-related terms, organizing presentation content, and expressing ideas confidently in English. These difficulties may reduce students' participation and engagement during classroom communication activities.

The challenges indicate the need for learning approaches that provide students with more opportunities to practice speaking in meaningful contexts. Tai and Chen (2023) emphasized that interactive learning activities can support students' communication skills, confidence, and engagement in ESP environments. Therefore, innovative approaches that combine communication practice, authentic tasks, and technological support are needed to help students participate more actively in ESP speaking activities.

Project-Based Learning as a Student-Centered Approach

Project-Based Learning (PBL) is considered an effective approach for creating meaningful and student-centered learning experiences. Through project activities, students are encouraged to apply knowledge, collaborate with peers, solve problems, and communicate their ideas through authentic tasks. Kessler (2021) stated that technology-supported collaborative learning activities can enhance students' interaction, engagement, and participation by providing opportunities for meaningful communication.

In ESP contexts, PBL allows students to practice English while working on discipline-related projects. For Information Systems students, project presentations can provide opportunities to use technical vocabulary, organize professional explanations, and communicate technology-related ideas in English. However, students may still require additional support in preparing content, improving language accuracy, and developing confidence before presenting their projects.

AI-Assisted Language Learning

The development of Artificial Intelligence (AI) technologies provides new opportunities to support language learning activities. AI tools such as ChatGPT, Google Gemini, and ELSA Speak can assist students in generating ideas, reviewing grammar, practicing pronunciation, and preparing presentation materials. In ESP learning contexts, AI can function as a learning assistant that supports students during communication practices and project preparation.

Previous studies have reported positive perceptions regarding AI integration in English learning. Erito (2023) found that AI-assisted learning supported students' motivation, confidence, and autonomy in completing English-related tasks. Similarly, AI-supported activities can provide students with additional opportunities to practice language use and receive feedback during the learning process. However, responsible AI use remains important because students need to maintain independent thinking and avoid excessive dependence on AI-generated content.

Research Gap and Research Questions

Previous studies have explored the benefits of Project-Based Learning and Artificial Intelligence in English language learning contexts. Nandiana et al. (2022) found that PBL activities contributed to students' confidence, participation, and speaking engagement through collaborative presentation tasks. Meanwhile, Erito (2023) highlighted that AI integration in ESP learning supported students' motivation and learning autonomy.

However, limited studies have examined the implementation of AI-assisted Project-Based Learning in ESP communication classes among Information Systems students, particularly in speaking activities related to discipline-specific terminology. Rafiq et al. (2021) highlighted that technology-supported learning in ESP can enhance accessibility, learner autonomy, and contextualized language practice, particularly in developing specific vocabulary and language competencies required in different academic and professional fields. Doukkali et al. (2023) found that blended learning in ESP enhances student engagement, flexibility, and access to learning resources through the integration of technology-supported activities. Their study highlighted that technology integration promotes more learner-centered and contextualized language learning experiences. Previous research has mainly focused on general English learning outcomes, while less attention has been

given to how students perceive AI-supported project activities in preparing and communicating Information Systems concepts in ESP.

Therefore, this study aims to explore Information Systems students' perceptions and experiences of AI-assisted Project-Based Learning in ESP speaking activities. The study focuses on how AI tools support students' project preparation, speaking practices, and communication of Information Systems concepts rather than measuring direct improvement in speaking proficiency.

The research questions of this study are:

1. How do Information Systems students perceive the use of AI tools in project-based ESP speaking activities?
2. How do AI tools support students' preparation for ESP speaking projects?
3. What challenges or concerns do students experience when using AI in project-based speaking activities?

METHOD

Research Design

This study employed a qualitative descriptive research design to explore Information Systems students' perceptions and experiences of AI-assisted Project-Based Learning (PBL) in ESP speaking activities at Universitas Bina Sarana Informatika. A qualitative descriptive approach was selected because it enables researchers to understand participants' experiences, perspectives, and interpretations of educational phenomena within their natural learning context. Creswell (2014) stated that qualitative research focuses on exploring the meanings individuals or groups assign to social and educational experiences.

Research Context and Participants

The study was conducted in the English 2 course for Information Systems students at Universitas Bina Sarana Informatika during the 2024/2025 academic year. The course was designed as an English for Specific Purposes (ESP) class that focused on English communication related to Information Systems, including technical terminology, academic presentations, and professional communication practices.

The participants consisted of 45 second-semester Information Systems students who were selected through purposive sampling. The participants were chosen because they had direct experience participating in AI-assisted project-based speaking activities during the ESP course. The participants were approximately 22–25 years old and had beginner-level English proficiency based on their previous English learning experiences.

The AI-assisted PBL activities were implemented over four meetings within one month. During the learning activities, students completed an individual project involving the creation of an AI-related presentation in English. Throughout the project process, students utilized AI tools, including ChatGPT, Google Gemini, and ELSA Speak, to support idea development, vocabulary exploration, pronunciation practice, grammar revision, and presentation preparation. The project activities were designed to provide students with opportunities to practice communicating Information Systems-related ideas using English in an academic context.

Research Instrument

The primary instrument used in this study was an open-ended questionnaire. The questionnaire was developed to explore students' perceptions and experiences regarding the implementation of AI-assisted PBL in ESP speaking activities. The questions focused on several aspects, including students' perceptions of AI tools, the

role of AI in preparing speaking projects, the contribution of AI to language practice, and challenges or concerns experienced during AI use.

The open-ended format allowed participants to provide detailed responses based on their personal experiences during the learning process. This instrument was considered appropriate because it enabled the researcher to identify various perspectives and explore students' experiences with AI-supported speaking activities.

Data Collection Procedure

Data collection was conducted after students completed the AI-assisted project-based speaking activities. The researcher distributed the open-ended questionnaire to the 45 participants and explained the purpose of the study, the procedures for completing the questionnaire, and the importance of providing honest responses based on their experiences.

Students were given adequate time to answer the questions individually. After collection, all responses were organized and prepared for qualitative analysis. The students' responses were anonymized to protect participants' privacy and ensure confidentiality throughout the research process.

Data Analysis

The collected data were analyzed using thematic analysis adapted from Braun and Clarke (2006). The analysis process involved several stages, including data familiarization, generating initial codes, identifying potential themes, reviewing and refining themes, and interpreting the findings. Through this process, recurring patterns related to students' perceptions of AI tools, AI support in project preparation, speaking practices, and challenges in AI-assisted project-based learning were identified.

Thematic analysis was selected because it provides a systematic method for analyzing qualitative responses and identifying meaningful themes related to participants' experiences and perspectives.

Ethical Considerations

Ethical procedures were considered throughout the research process. Before data collection, participants were informed about the purpose of the study, the voluntary nature of participation, and their right to refuse participation without any academic consequences. Informed consent was obtained from all participants before collecting their responses.

The confidentiality and anonymity of participants were maintained by removing personal identifiers from the collected data. The participants' responses were used only for academic research purposes, and permission was obtained to analyze and report their responses in this study.

RESULTS AND DISCUSSION

1. AI as a Support Tool for Presentation Preparation

The first major theme identified from students' responses was the role of AI as a support tool for preparing ESP speaking projects. Most participants perceived AI tools as useful assistants during the preparation stage, particularly for developing ideas, organizing presentation content, preparing speaking scripts, improving grammar, and selecting appropriate vocabulary.

Students explained that AI helped them transform their initial ideas into more structured presentation materials. For example, one participant stated:

"ChatGPT helped me generate project ideas, develop speaking dialogues, improve grammar, and provide pronunciation examples and vocabulary suitable for ESP materials." (Student 23, open-ended questionnaire)

Another student explained:

"AI in PBL made it easier to prepare presentations because it helped me organize ideas, create scripts, and find better words to use in English." (Student 22, open-ended questionnaire)

These responses indicate that students perceived AI as a supportive tool that reduced difficulties during presentation preparation. For beginner-level ESP learners, preparing English presentations requires not only language knowledge but also the ability to organize technical information into understandable explanations. AI tools appeared to support this process by providing examples, language suggestions, and organizational assistance.

This finding suggests that AI functions as a cognitive support tool within ESP learning. Rather than replacing students' thinking, AI helps students manage linguistic challenges and focus on communicating Information Systems concepts more effectively. This finding is consistent with previous research showing that AI-assisted learning can support idea generation, language revision, and learner autonomy in English learning contexts (Erito, 2023; Syarifah et al., 2024).

2. AI as a Practice Partner for Pronunciation and Speaking Confidence

The second theme relates to students' perceptions of AI as a practice partner for speaking preparation. Students reported that AI tools provided opportunities to practice pronunciation, review sentences, and rehearse speaking before delivering presentations.

One participant stated:

"AI in PBL helped me improve my pronunciation, vocabulary, and sentence structure. I also became more confident because I could practice speaking and check my mistakes first before presenting." (Student 7, open-ended questionnaire)

Another student mentioned:

"AI integrated project-based learning pushed me to practice speaking anytime using AI tools such as ChatGPT voice or ELSA Speak." (Student 33, open-ended questionnaire)

These findings indicate that students perceived AI as creating a comfortable practice environment. Because students could practice repeatedly without fear of immediate judgment, they felt more prepared and confident before classroom presentations. This aspect is particularly relevant for beginner English learners who may experience anxiety when speaking in front of others.

However, these findings represent students' perceptions of AI support rather than direct evidence of speaking improvement. Therefore, the results suggest that AI-assisted activities helped students prepare and practice speaking more effectively, rather than proving measurable improvement in speaking proficiency.

Although students generally expressed positive perceptions toward AI, another important finding was their awareness of responsible AI use. Several participants recognized that AI-generated responses should be reviewed and that students should maintain independent thinking during learning activities.

One participant stated:

"AI works best as a practice partner, not a replacement for my own thinking." (Student 32, open-ended questionnaire)

Students also mentioned that AI outputs required verification because some information or language suggestions might not always match their intended meaning. This finding demonstrates that students did not simply depend on AI but developed awareness regarding its limitations.

The findings highlight the importance of AI literacy in ESP learning, the finding support studies from Han (2025), Indrapuri et al., (2025), Hsiao et. Al., (2023) showed that AI can provide valuable support, students need guidance on evaluating AI-generated information, maintaining creativity, and using AI ethically during academic activities in ESP classroom.

3. Challenges and Concerns Experienced by Students When Using AI in Project-Based Speaking Activities.

The third theme identified from students' responses concerns the challenges and concerns experienced when using AI tools during project-based ESP speaking activities. Although most students perceived AI as a helpful learning assistant, several participants also reported difficulties related to AI reliability, dependency, language accuracy, and the need for critical evaluation of AI-generated responses.

One of the main concerns expressed by students was that AI-generated information and language suggestions could not always be accepted directly without checking. Students recognized that AI sometimes provided responses that required revision to match their intended meaning, project context, or level of English proficiency. One participant stated:

"Sometimes AI gives answers that are not completely suitable for my topic, so I need to check and adjust the information before using it in my presentation." (Student 15, open-ended questionnaire)

Another student explained:

"AI helps me a lot, but I still need to correct some sentences because the language generated by AI is sometimes too difficult for my English level." (Student 21, open-ended questionnaire)

Students also expressed concerns about becoming too dependent on AI tools during the learning process. Some participants acknowledged that excessive reliance on AI might reduce their effort in developing their own ideas and practicing English independently.

One participant mentioned:

"AI is useful for helping my work, but I think students should not depend on it completely because we still need to develop our own ideas and abilities." (Student 32, open-ended questionnaire)

Another student similarly stated:

"Using AI makes preparation easier, but I still need to practice by myself because AI cannot replace real speaking practice." (Student 35, open-ended questionnaire)

In addition, some students experienced challenges related to using AI effectively. Students needed appropriate prompts and strategies to obtain relevant responses from AI tools. Without clear instructions, AI-generated outputs were sometimes considered too general or unrelated to their specific ESP context.

One participant explained:

"Sometimes I do not get the answer I need because my questions are not specific enough. I need to learn how to give better instructions to AI." (Student 40, open-ended questionnaire)

These findings indicate that while AI provided valuable support in project-based ESP speaking activities, students also needed digital literacy skills to use AI effectively. The challenges reported by students highlight that AI should function as a supportive learning tool rather than a replacement for students' creativity, critical thinking, and communication practice.

This finding has important implications for ESP pedagogy. Lecturer should not only introduce AI tools as learning assistants but also guide students in evaluating AI-generated information, developing effective prompts, and maintaining active engagement in the learning process. Responsible AI integration requires a balance between technological support and students' independent language development.

Additionally, the findings align with studies discussing AI integration in project-based learning environments. Citra et. al (2025) reported that AI-supported project-based learning promotes interactive learning, creativity, learning efficiency, and autonomous learning experiences. Students in the present study also perceived AI as helpful for brainstorming ideas, organizing presentations, correcting grammar, and improving speaking fluency during ESP project activities. Overall, the findings strengthen previous research indicating that AI-integrated project-based learning creates a more supportive, interactive, and confidence-building environment for ESP students.

Based on the findings, three main themes were identified regarding the role of AI-assisted Project-Based Learning in ESP speaking activities:

1) AI tools as supportive assistants for ESP speaking preparation and presentation readiness

Students perceived AI tools as valuable learning assistants that supported their preparation for ESP speaking activities. AI was reported to assist students in practicing pronunciation, reviewing grammar, enriching vocabulary, organizing speaking content, and preparing presentations. Students also highlighted that AI provided quick responses and immediate support when they encountered difficulties during the learning process. Instead of relying only on classroom explanations, students could independently access language support and receive suggestions during project preparation. This immediate assistance was perceived to make the learning process more efficient and reduce difficulties when students worked on their speaking projects.

2) AI-assisted Project-Based Learning supported independent practice and speaking confidence

The findings indicate that students perceived AI-assisted PBL as providing opportunities for independent learning and speaking practice. AI tools allowed students to rehearse their presentations, review their language use, and practice before performing in front of the class. For some students, this process helped reduce speaking anxiety because they could practice in a less stressful environment without fear of immediate judgment. However, students also recognized that AI should function as a learning support tool rather than replace their own speaking practice, creativity, and critical thinking.

3) AI supported idea development, script preparation, and presentation organization

One of the most frequently mentioned benefits of AI integration was its support in developing presentation materials. Students perceived AI as helpful in generating ideas, creating presentation scripts, organizing information logically, structuring sentences, revising grammar, and selecting appropriate vocabulary for their ESP projects. Many students reported that having better-organized scripts and clearer presentation structures

increased their readiness and reduced uncertainty before speaking activities. These findings suggest that AI-assisted PBL can support students in managing the linguistic and organizational challenges involved in preparing English presentations related to Information Systems topics.

The findings of this study are also consistent with previous research conducted by Syarifah et.al (2024) published in Journal of English Language Learning, which revealed that students positively perceived the use of AI tools such as ChatGPT, Grammarly, and QuillBot in supporting English Learning. Their study found that AI assisted students in grammar checking, idea generation, and receiving feedback. Similarly, the present study found that AI-supported project-based speaking activities help students improve pronunciation, grammar, vocabulary, confidence, and presentation presentation in ESP classes.

4. Implications, Limitations, and Suggestions for Future Research

1) Implications of the Findings

The findings suggest several implications for ESP pedagogy. AI-assisted Project-Based Learning can provide students with additional support during speaking preparation by assisting with idea development, language revision, pronunciation practice, and presentation organization. Educators may consider integrating AI tools as supportive learning assistants within meaningful project activities rather than replacing traditional communication practices.

Furthermore, the combination of AI and PBL can create more student-centered learning environments where learners actively prepare, practice, and communicate discipline-related content. However, educators should also emphasize responsible AI use by encouraging students to evaluate AI-generated information and maintain independent thinking.

2) Limitations of the Study

This study has several limitations. First, the participants were limited to 45 Information Systems students from one study program at a single institution, which may restrict the transferability of the findings to other educational contexts.

Second, the study relied on students' self-reported perceptions collected through open-ended questionnaires. Therefore, the findings represent students' experiences and perceived benefits rather than objective evidence of speaking improvement.

Third, this study did not include direct measurement of students' speaking performance, such as speaking tests, assessment rubrics, or comparisons before and after AI-assisted learning activities. Therefore, future studies should include objective assessments to examine whether AI-assisted PBL contributes to measurable changes in speaking ability.

3) Suggestions for Future Research

Future research is recommended to involve larger and more diverse participants from different educational contexts. Experimental, mixed-method, or longitudinal research designs may provide deeper understanding regarding the actual impact of AI-assisted PBL on students' speaking performance.

Further studies may also investigate specific AI tools and compare their effectiveness in supporting different language skills. Additionally, future research can explore how students develop AI literacy, critical thinking, and responsible AI usage practices in technology-enhanced ESP learning environments.

CONCLUSION

This study concludes that Information Systems students perceived AI-assisted Project-Based Learning as a helpful approach for supporting ESP speaking activities. Based on students' responses, AI tools were perceived as useful learning assistants that supported idea development, script organization, vocabulary enrichment, grammar correction, pronunciation practice, and presentation preparation. Students also reported that AI-assisted project activities provided additional opportunities to practice speaking, prepare presentations, and build confidence before classroom performances.

The findings further indicate that the integration of AI and Project-Based Learning created a more interactive, flexible, and student-centered learning environment. Through project activities and AI-supported practice, students experienced greater opportunities for independent learning and communication practice in meaningful ESP contexts. Furthermore, several students demonstrated critical awareness of responsible AI use by recognizing that AI should support rather than replace their own ideas, creativity, and critical thinking.

Therefore, AI-assisted Project-Based Learning may serve as a supportive instructional approach in ESP speaking classes, particularly for helping Information Systems students prepare and practice English communication related to their field. However, further research using objective speaking assessments is needed to examine the actual impact of AI-assisted PBL on students' speaking performance.

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