Research article

Leveraging Collaborative Project-Based Learning to Encourage Speaking Proficiency in EFL classroom: A Case Study in Engineering Department

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Abstract:
The study aims to explore students' perspectives on the implementation of collaborative project-based learning (CPBL) in the Engineering Department as a means to enhance their understanding of the subject matter and develop problem-solving abilities. A quasi-experimental design was employed, and data was collected through a semi-structured questionnaire. The results indicate that CPBL has the potential to improve students' speaking and presentation skills in various aspects, including grammar, discourse competence, sociolinguistics, strategic competence, fluency, accuracy, and presentation skills. The study also recommends further investigation into computer-mediated communication within group projects and suggests incorporating controlled and energizing task speaking during comparison evaluations to foster reflective thinking among both teachers and students. In summary, this research highlights the positive impact of CPBL on language and presentation skills within the Engineering Department, emphasizing its potential benefits for student learning.

Keywords:
Collaborative
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INTRODUCTION

Despite the evidence from previous research that research on collaborative project-based learning (CPBL) has shown that it can improve students' subject knowledge and skills as well as their problem-solving abilities (Liang et al., 2021; Loes and Pascarella, 2017; Zand & Chen, 2021), (Lin, Hou, H & Chang, 2020; Tang, 2021). However, there is little research on its application in engineering departments. The current study addresses this gap and suggests that instructors should abandon traditional lecture methods in favor of a collaborative teaching strategy that involves students. (Sam, 2016).

English for Specific Purposes (ESP) is an English language instruction that focuses on teaching students the language skills required for their specific discipline, such as engineering. With the rapid growth of global technology, professional English competence is becoming a must for engineers, not just a choice (Terauchi, Noguchi, & Tajino, 2019: p. xviii). It is essential for engineers to communicate effectively both orally and in writing, using appropriate language features. In fact, the English language is often more critical to success in the global marketplace than an engineer's technical skills. To enhance students' English language proficiency, teachers employ various techniques such as debate competitions (Stockdale, 2020), role plays (Brady, 2018), simulations (Yang, 2022), and group-based project learning (Kim & Lim, 2018). Project-based learning and collaborative learning are highly compatible and interdependent approaches that can be successfully applied in university classrooms. In this approach, students from different backgrounds and academic levels work together in small groups to achieve a common goal. The social constructivist theory asserts that student collaboration promotes participation and information sharing (Nur & Butarbutar, 2022a, Salomon, 1993). The students are responsible for their own learning as well as that of their peers, which calls for group dependence as well as motivation, persistence, and adaptation (Abrami et al., 1995). Socially relevant instruction boosts student ownership of their learning processes and encourages involvement (Harrison & Stephen, 1996; Resnick, 1989).

Thornburry points out that in order to provide the ideal conditions for effective and independent language use, each speaking activity must be efficient, meaningful, engaging, demanding, safe, and authentic (2007). In view of the demands of interactive activities, the current research suggests CPBL as a strategy for motivating students to work in pairs to jointly construct a project presentation (Butarbutar, 2021).

This course served as the prerequisite for teaching ESP in the engineering program at the Musamus Merauke University in Indonesia. Its curriculum seeks to hone students' abilities in reading, writing, speaking, and listening, especially in the study of engineering. The use of the CPBL is a workaround for this course's English language instruction. In light of this, the current study's objective is to find out what the engineering department students think of CPBL.

LITERATURE REVIEW

Collaborative project-based learning

The current research's guiding principle supports constructivism as a learning theory. Constructivism promoted knowledge production as a means of engaging students in project work on an intellectual and active level. CPBL, or a comprehensive approach to teaching and learning in the classroom, strives to involve students in the investigation of real-world situations, according to (Blumenfeld et al., 1991). Interest and value are essentially two great potentials. Depending on how much interest and importance they place on the project's challenge and components, students' motivation to work on projects will vary. Student interest and perceived value are increased when tasks are varied and include novel elements, problems are genuine and have value, problems are challenging, problems have closure in the form of an artifact, tasks have choice over what and/or how work is done, and there are opportunities for collaboration (Nur & Butarbutar, 2022b).

Conceptually, CPBL projects differ greatly from conventional exercises designed to help students acquire material in the absence of a main problem. These conventional activities may relate to one another and assist students in acquiring course material in the absence of a major problem, but they cannot ensure learning in the same way as those organized for a

meaningful intellectual objective. Project-based learning proponents contend that when students conduct research and explore for solutions to problems, they acquire knowledge of fundamental theories and concepts. Project-based learning also places students in actual, contextualized problem-solving scenarios. By offering context to and illustrating the relevance of systematic inquiry to the questions and answers that arise in daily activities, projects may help students make the connection between what they learn in the classroom and what they experience in the real world. Project-based learning therefore requires persistent, active student participation. Project-based learning also fosters links between subject-matter disciplines and provides a broad rather than narrow perspective on the subject. Additionally, projects can be changed to meet different learner types and instructional contexts.

Additionally, projects need to be designed in a way that (1) marshals, (2) produces, (3) maintains, and (4) generates student motivation in order for CPBL in engineering to be successful. We might look into the most effective project layouts that will inspire the majority of students. We will look at project design factors that could (a) affect interest and value, (b) perception and attainment of competence, (c) task focus, and (d) suggest questions for further research on these factors (Blumenfeld et al., 1991).

Making presentations could be used to assess how well the engineering department is supporting EFL, CPBL, and speaking skills. To do this, students must adhere to the teacher's interventions, such as those for engineering, assessment, classroom management, and learning environment. To effectively complete the project, students needed to demonstrate speaking EFL skills as well as presentation skills (eye contact, facial expression, hand gestures, audience involvement, and subject mastery (Chase et al., 2020), grammatical, discourse, sociolinguistics, strategic, fluency, and accuracy (Bailey & Nunan, 2005).

METHOD

Research design and participants

In order to address the research topic, the present study was created as a quasi-experiment. In order to examine the efficacy and safety of various non-randomized treatments in the real world, people or groups of individuals in a prospective or retrospective study self-select into one of several different treatment groups (or have their healthcare practitioners do so on their behalf). The primary difference between quasi-experiments and randomized controlled trials is that patients in observational studies self-select into different therapies rather than being assigned to them at random. The terms "treatment" and "intervention" are used interchangeably throughout the following (Maciejewski, 2020). The students' perceptions were confirmed using ten semi-structured questions. It was given out at the conclusion of CPBL.

Techniques for gathering and analyzing data

At the first class meeting, the instructor introduces the objectives of the course curriculum and the requirements for the final class meeting. The class was then divided into four groups of four pupils each. Each group must therefore prepare a presentation that will be delivered at the end of class. It developed its project by responding to two questions: (1) What procedures must be followed when selecting a material for a specific application? What trade-offs must be made when choosing a certain material, and (2)? They are provided some pointers, as seen in Table 1, to help students feel more at ease with the assignment.

Table 1.
CPBL presentation structures

Introduction (after greeting the audience and introducing yourself or being introduced)
The theme of my presentation today is going to be...
Today, I'd like to share a new finding from our investigation into...
Today, I want to concentrate on...
Describing the presentation's structure
I'll talk about the following three elements of this:
My presentation will be structured as shown on the slide after that.
I'll start by researching... Then, significant findings in the area of... will be discussed.
The most current research will then be addressed.
adding a new part or point
After talking about..., I'll go on to...
Now let's talk about a different issue.
mentioning visual aids
As seen in the following presentation, picture, or table...

This graph depicts the relationship between... and...
The table below provides typical values for...
We displayed the data in this graph together with...
Concluding/summarizing
Finishing up
To sum up/conclude/sum up...
posing inquiries
If you have any questions, please don't hesitate to ask me to stop talking.
I appreciate you giving me your time.
I will now be pleased/happy to answer inquiries.
addressing inquiries
Right now, I'm unable to respond to your query, but I will research it and get back to you.
Perhaps by once again looking at/referring to the table, this question can be solved.

(Phrases modified from Eisenbach, 2011)

In light of data analysis, ten semi-structured surveys were analyzed after the presentation using a Four-Likert scale: 1 for "strongly disagree," 2 for "disagree," "3 for agree", and 4 for "strongly agree." Data were analyzed using statistical descriptive methods using SPSS software.

FINDINGS

Semi-structure questionnaire results

Table 2.
Statistic descriptive

Speaking components	N	Minimum	Maximum	Mean	Std. Deviation
Grammar	20	1	3	1.10	.447
Discourse competence	20	2	4	3.55	.605
Sociolinguistic	20	3	4	3.80	.410
Strategic competence	20	3	4	3.80	.410
Fluency	20	3	4	3.70	.470
Accuracy	20	2	4	3.90	.447
Presentation skills					
Eye contact	20	1	4	3.70	.923
Facial expression	20	1	4	3.85	.671
Hand gestures	20	3	4	3.85	.366
Audience involvement	20	3	4	3.70	.470
Topics mastery	20	2	4	3.50	.607
Valid N (list wise)	20				

Table 2 displays the lowest mean of 1.10 points, indicating that throughout the CPBL presentation, students' opinions of grammar components were strongly disagreed with. Contrary to popular opinion, students' views were most in line with the usage of hand gestures

when they were shown CPBL data. It was strengthened by semi-structured questionnaires given to group representatives, as follows: By completing the assignments, Group 1 states, "We will be able to share information with individuals who have diverse experiences, which is why we are interested in this joint effort."

Group 2: "In our group's opinion, we developed a project jointly, which enabled us to complete it on schedule because we worked jointly."

Group 3: "As the group leader, I believe that learning through collaborative projects is consistent with my department, engineering."

Group 4: "Absolutely, I agree with learning collaboration; we can aid one another, but at times we struggle when there is one group member who does not involve or is a passive friend when conversation is going on."

DISCUSSION

The results showed that two distinct presentation skills enabled students to successfully support presentations. It is congruent with statistical descriptive analysis. The CPBL demonstrated the students' desire to create a project for presentation. Together, each group member developed a presentation that responded to the two predetermined questions. Students' engagement and interdependence in this process are demonstrated by the exchange of ideas that results in a major solution. According to (Blummenfeld et al., 1991), project-based learning is a comprehensive approach to learning and teaching that involves students in authentic discovery through task focus. Our research adheres to this school of thought. Each group contributes labor, demonstrating teamwork, by looking up definitions, factors, compositions, and processes when using the material. In line with this, the present study is based on the constructivist learning theory, which emphasizes knowledge creation as a cognitive process. This thought process has been verified by Duffy et al (2022). They argued that the activities of analysis, synthesis, evaluation, reflection, and communication help to

foster critical thinking. Students demonstrated all facets of critical thinking as they worked together to produce project presentations (Boardman & Hovland, 2022).

Furthermore, the current study supports Vygotsky's social cognitive learning theory (1978). Because of CPBL, students get a wonderful opportunity to work together with classmates who are scaffolding. A chosen group leader functioned as the scaffolder since they recognized that he had greater knowledge and understanding of material composition procedures. In general, CPBL has the potential to boost students' enthusiasm and engagement because the presentation topic is pertinent to their genuine interest in engineering (Boardman & Hovland, 2022). Supporters of project-based learning claim that when students conduct research and look for answers to issues, they learn fundamental theories and concepts. Students are also exposed to real-world, contextualized problem-solving situations through project-based learning. Projects may assist students in drawing connections between what they learn in the classroom and what they encounter in the real world by providing context and demonstrating the relevance of systematic inquiry to the questions and answers that arise in daily activities. Thus, project-based learning necessitates sustained, engaged student participation. Additionally, project-based learning encourages links between disciplines and offers a broad rather than a focused viewpoint on the subject. Projects may also be modified to accommodate various learner types and instructional contexts.

According to the statistically descriptive data from the presented study, speaking components like discourse, strategy, sociolinguistics, fluency, and correctness all had mean scores over three points, with the exception of the grammatical component. According to the participants' experiences, it is agreed that the grammar portion was the most difficult. According to (Aleksandrzak, 2011) grammar errors are one of the major challenges in learning and teaching advanced speaking. She asserts that the area of information that has to be appropriately activated in order to be made available for use in regular speaking practice both within and outside of the classroom is grammatical knowledge. Importantly, the mental processes necessary for speaking do not differ significantly between native and target languages. Both involve combining the processes of formulating, articulating, self-monitoring,

and negotiating (Thornburry, 2007). For this reason, the research was contrasted with Thorburry's (2007) findings that academic presenting is a technique for speaking development. He underlined that academic presenting would be particularly beneficial for individuals who learn a language for academic purposes and need experience giving presentations or writing conference papers. This exercise should be preceded by a discussion of the genre's formal qualities and an examination of the distinctive linguistic patterns characteristic of each stage of an academic presentation. As a critical part of the practice, students should watch models or real presentations before they actually start crafting their speeches. Additionally, they ought to talk about how each student's presentation went afterward (audience responses, delivery style, time management).

CONCLUSION

Our findings are in line with 21st-century competencies, such as, for example, the capacity for communication and teamwork. We need to design, acquire, and maintain two abilities because I'm a freshman in the engineering program. In terms of reflection, schools should offer collaborative curriculum that is interwoven with technology because students will be returning to society after graduating from college. They must demonstrate their abilities abroad if they want to be considered competent engineers. Although students are encouraged to develop and practice their leadership, decision-making, communication, and conflict-management abilities, academic knowledge alone is insufficient. Overall, the results of this study are consistent with collaborative-based project learning, which is a significant method for improving students' speaking abilities in EFL but not their grammatical knowledge. We contend that there was a restriction nevertheless, and we also urge further research. Additionally, it is advised to look into computer-mediated communication in collaborative project-based learning. The study suggests controlled and stimulating task speaking to encourage reflective thinking in teachers and students during comparative evaluations.

CONFLICT OF INTEREST

No conflict of interest reported by the authors

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