Using the Buana Online Course web-based mobile application to improve English for specific purpose engineering courses

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ABSTRACT

This study investigates the effectiveness of the Buana Online Course (BOC) web-based mobile application in enhancing English for specific purposes (ESP) skills among engineering students and explores their perceptions of the course's effectiveness in improving their language proficiency and comprehension of technical texts. The BOC is a learning management system developed by Universitas Buana Perjuangan Karawang Indonesia, and the study involved 49 industrial engineering students from the university. A quantitative research design was employed, with data collected via questionnaires and analyzed descriptively to assess the responses. The findings indicate that the BOC is effective in teaching ESP, with a 49% improvement in reading skills, a 38.80% improvement in writing skills, a 38.80% improvement in communication skills, a 40.80% improvement in applying language skills in an engineering context, and a 38.80% improvement in communication skills. A total of 40.80% of the students showed that the BOC learning management system could be one of the learning media that increases understanding of the cross-cultural aspects among engineering students. The implications of this study suggest that online courses and web-based applications can play a significant role in facilitating ESP learning in engineering contexts and provides valuable insights for educators and institutions aiming to enhance language education through technological integration.

Contribution/Originality: This research is original in its evaluation of the effectiveness of a mobile-based web application specifically for ESP courses among engineering students, using quantitative methods to measure specific language skill improvements. Few existing studies have combined this approach in the context of engineering and ESP.

1. INTRODUCTION

1.1. Background

As a result of globalization, it is crucial to master English in various professional contexts (Mohamed, 2024). English has become a fundamental part of the *lingua franca* in diverse contexts such as business, technology, finance,

and health (Rajeswaran, 2018). English has a different role in the world of education. Almost all texts at many universities use English as the intermediate language (Machmud, 2018). Currently, learning English not only focuses on general aspects but also considers the specific needs of individuals in the context of their work or career (Putro, Damio, Sukarno, & Purnawan, 2022). Learning English without specific objectives is not enough to meet the needs of students to obtain an education because, in some fields, exact terms can only be understood by certain groups (Pushmina, 2021).

For this reason, English for specific purposes (ESP) is a learning method that can adapt the learning of English to the specific needs of students (Hidayati & Meisani, 2023). With the ESP method, students are expected to be able to improve their speaking skills, describe procedures, and demonstrate a formal process according to the field in which they excel (Iswati & Triastuti, 2021). Developing a learning curriculum that supports the use of English is crucial in the era of globalization (Govindarajan & Christuraj, 2023). The teacher has more of a role in developing an effective learning syllabus so that students can apply English in their field (Megat-Abdul-Rahim, Idris, Rahman, Shaq, & Nasir, 2021).

The various research results regarding the effectiveness of online courses in ESP learning leaves an exciting gap for further research (Alkhaldi, Ozdemir, & Alhasan, 2022). In several studies, online courses have been considered effective for improving students' ability to learn ESP (Caciora, Sturza, & Supuran, 2021). However, other studies state that learning ESP using online media is less effective than teaching ESP face-to-face (Cheng, 2006). The variety of online learning platforms and their different features are also factors that can influence the differences in the results of previous studies. In addition to the research gap, the absence of literature discussing the effectiveness of using the BOC in ESP learning in the Department of Engineering requires urgent research (Mohamed, 2024).

In response to the lack of knowledge regarding the English for specific purposes skills needed by industrial engineering students and stakeholders, previous research findings (Hakiki, et al., 2024) indicate that ESP in industrial engineering is effectively used in teaching and learning activities (Alkhaldi et al., 2022). This research focuses on how the Buana Online Course as a learning management system is used to carry out English lessons for engineering and how effective the web-based mobile app is in presenting features and lessons to the students of industrial engineering programs.

1.2. Significance of the Study

The topic of this study is on the effectiveness of ESP in facilitating students to learn English according to the needs of their respective fields. Research conducted by Alsalameen, Almazaydeh, Alqudah, and Elleithy (2023) states that students feel satisfied with using a learning management system (LMS) in forming a chatbot because chatbots can provide fast answers to questions. However, chatbots also have drawbacks which include a lack of in-depth explanations and a human element. Learning English online gives a positive impression to students because they feel that this learning method is different from conventional methods (Sakulwichitsintu, 2023). The combination of media, Moodle, and Team Learning Discords also form a valuable digital learning environment that can encourage knowledge exchange and learning (Berkeshchuk, Shcherbak, Shkvorchenko, Masytska, & Chornyi, 2020). ESP learning by using learning videos as a medium has also proven effective in increasing students' ability to understand English (Astutik, Setiawan, Anam, & Suhartono, 2022). Another study states that the application of blended learning is more effective than full online-based learning because the blended learning model supports the practicality of sharing material, independent classes, and saves time and money in the learning process (Hakiki et al., 2023). Some students also stated that they prefer to study on-site rather than online (Rachman, Margana, & Priyanto, 2022). They assume that direct interaction greatly influences understanding in the learning process. However, some students still believe that online learning can be managed to create effective learning (Ma, Chutiyami, Zhang, & Nicoll, 2021). A study conducted by Savchuk, Sichkar, Khlystun, Shuliak, and Avramenko

(2019) states that even though online learning has limitations, WhatsApp can be designed to support the ESP learning process.

2. LITERATURE REVIEW

2.1. Buana Online Course

The Buana Online Course (BOC) is a web-based learning application created by Universitas Buana Perjuangan Karawang, Indonesia. It has some great features that provide teaching and learning activities. It also has a mobile version integrated with the Moodle app. The students can access it from the official website https://elearning.ubpkarawang.ac.id/. Both students and teachers of engineering courses can log in to this website to join and follow the course. The BOC provides various learning tools and management systems such as attendance, assignments, certificates, chat, forums, discussions, quizzes, surveys, files and labels. All of these features can be integrated into YouTube or other social media platforms by accessing https://elearning.ubpkarawang.ac.id. Buana Online Course can automatically generate and integrate with YouTube or other social media platforms; it can play audio or video linked to social media platforms and can automatically play the video and audio file.

2.2. ESP in Engineering Study

English for specific purposes is a new approach to learning and using English for specific fields (Rachman et al., 2022). ESP cannot be considered a separate part of English language teaching but as an area where courses focus more on narrower objectives and topics (Marcu, 2020). In this case, ESP in engineering study can be interpreted as a learning approach to the English language tailored to the needs of engineering students or technicians to support their work. Understanding instructions, answering questions about techniques, reading textbooks related to the field, and note-taking skills in lectures are emphasized in ESP classes (Li, 2018).

The ESP English for Engineering module in the BOC provides specific features for ESP engineering students. For ESP in engineering to run effectively, an analysis of learning conditions, student needs and learning objectives is needed (Almadhun, Toycan, & Adalier, 2019). The ESP method in engineering also requires an assessment that aligns with the learning objectives. By implementing appropriate review forms, teachers and students can identify their weaknesses in learning English. These weaknesses can serve as a source of reflection for teachers and students to enhance the subsequent teaching and learning process. The material in ESP learning must be well prepared to facilitate students' understanding of English concepts appropriate to their field (Iftanti, Imelda, & Yunita, 2023). Thus, when students read source texts and information about techniques, they can understand and implement this information in areas relevant to their goals (Tahang, Manuputty, & Uluelang, 2021).

2.3. Online Courses and Language Learning

As with face-to-face learning, online learning allows students to communicate with each other and collaborate as a team on specific projects. Online learning also enables students to study independently (Upton & Adams, 2006). One type of online course is a learning management system (LMS), which integrates various online functions such as online meetings, chatbots and virtual classrooms into one platform (Essel, Vlachopoulos, Tachie-Menson, Johnson, & Baah, 2022). The learning model within the LMS allows the teacher to serve as a learning advisor or facilitator, while students acquire knowledge through discussions, completing assignments and engaging in collaborative cooperation (Bahri, Idris, Muis, Arifuddin, & Fikri, 2020). The Buana Online Course is an LMS used by students at Universitas Buana Perjuangan Karawang, Indonesia. It has features that take attendance and allow students to send assignments and conduct discussions online.

Learning English at an advanced level emphasizes speaking and writing skills and comprehension, enabling students to actively participate in class (Alagha & Jones, 2021). In tertiary institutions, the emphasis on learning

English also lies in the ability to comprehend complex academic texts. For the English learning process to be effective, linguistic support is necessary to make the material more accessible (Guillén-Gámez, Lugones, & Mayorga-Fernández, 2019).

2.4. Effectiveness of Online Courses in ESP

Several studies are being conducted to test the effectiveness of online learning, including research conducted by Ulla and Perales (2021) on the significance of online courses in Vietnam. The study states that online courses prove effective in increasing the diversity of educational activities, collaboration between colleagues, knowledge transmission, and interactive communication between lecturers and students, as well as providing a variety of approaches for teachers to evaluate student learning (Tai & Chen, 2020). Other research found that online courses in ESP received positive responses from students in universities in Ukraine. Online learning shows significant progress in understanding ESP. However, it also presents challenges for students, many of whom feel technically and communicatively hampered (Cheung, Kwok, Phusavat, & Yang, 2021).

Online learning has been proven effective in improving students' cognitive ESP abilities and behavior but may not enhance their emotional intelligence (Tsou & Chen, 2014). The effectiveness of online ESP learning is also affected by other factors such as students' basic English skills, their affordability for online learning and teaching, interpersonal factors, teacher presence in the learning process, and learning assignments (Udu, 2021). On the other hand, in some research, online ESP learning is not always as effective as learning in the classroom because digital learning heavily relies on student initiative and motivation (Spence & Liu, 2013).

2.5. Research Objective

Some previous research show the effectiveness of learning English using a learning management system for students. Studies have shown that the use of technology, such as an LMS, can improve the English skills of pharmacy students at several universities in Indonesia. Students also stated that learning using the LMS positively impacted them because the method differed from face-to-face classes. Teacher performance in using technology as a learning medium also correlates with ESP learning outcomes for students (Karttunen & Juusola, 2019). Utilizing online learning methods integrated with project-based learning is effective in enhancing students' English comprehension and fostering teamwork skills. In another study, the writer concluded that online learning methods cannot facilitate all teaching materials that must be taught to students, so face-to-face interaction between teachers and students is necessary for the effectiveness of learning English (Safia & Ghania, 2020). The learning management system model can be said to be effective and facilitate the learning process if the learning is supported by face-to-face meetings (Hakiki, et al., 2024).

2.6. Research Question

Learning English for specific purposes using online media, such as a learning management system, brings challenges for ESP teachers (Tahang et al., 2021). Research shows that, on average, students in non-English majors have low writing skills (Alkhanani, 2022). They do not understand the schemes and linguistic features of argumentative writing in their handbooks (Junaidia, Hamuddinb, Simangunsongc, Rahmand, & Derine, 2020). Some students also have limitations in critical thinking that hinder them in the specific learning process in their field (Schenck, 2020). Various learning features are one of the factors that can influence the effectiveness of English for specific purposes using an LMS. One of the learning management systems used as a medium for learning English for specific purposes is the Buana Online Course, which is used by students in Universitas Buana Perjuangan Karawang, Indonesia (Suhardiman & Yulianti, 2022). Therefore, this study aims to gather the opinions of students who use the Buana Online Course to study English for specific purposes. To achieve this, the two formulations are:

(1) Is learning through the Buana Online Course web-based application effective in improving the English language skills of engineering students?

(2) Can ESP learning facilitate the understanding of engineering programs?

This research is original in evaluating the effectiveness of a mobile-based web application specifically for ESP courses among engineering students using quantitative methods that measure specific language skill improvements.

3. METHODOLOGY

3.1. Research Design

A quantitative approach was used for this research, which uses numbers and statistical calculations to analyze the variables being studied (Sardana, Shekoohi, Cornett, & Kaye, 2023). Because this research is used only to assess the effectiveness of a method, quantitative research is the most appropriate method. The sole aim of the study is to determine the extent of the efficacy of using the BOC in ESP learning for industrial engineering students.

3.2. Participants

This study involved 49 male and female students in the second semester of industrial engineering at Universitas Buana Perjuangan Karawang, Indonesia. The students' ages were mostly in the range of 17 to 22, and they are regarded as suitable research respondents because they receive the most ESP learning online. No specific criteria were used in this study because the researcher wants to explore the extent to which BOC media is used to improve the English skills of engineering students. The research was conducted by distributing online questionnaires in Google Forms to students majoring in industrial engineering at Universitas Buana Perjuangan Karawang, Indonesia.

3.3. Instrumentation

The study used a questionnaire with a 5-point Likert scale. The questionnaire consisted of 10-question instruments which included questions about the effectiveness of BOC in ESP learning, student satisfaction in using BOC as an ESP learning media, students' self-confidence after learning ESP using BOC media, and students' willingness to recommend BOC as an ESP learning media.

3.4. Data Collection Procedure

Data collection was carried out online through Google Forms because this medium is considered effective in collecting participant answers for quantitative research.

3.5. Data Analysis

A descriptive analysis was conducted to determine the percentage of participants for each instrument. The data is presented in the form of a pie chart to make it easy for readers to understand the research results.

4. RESULTS AND DISCUSSION

4.1. Participants' Demographic Characteristics

Determining the characteristics of the participants is based on the consideration that the second-semester students in the Engineering Department at the Universitas Buana Perjuangan Karawang are students who use the Buana Online Course facility as their learning media to study ESP to improve their understanding of engineering terminology.

4.2. Perceived Effectiveness of the Buana Online Course in Improving ESP Skills

The study found that 30.60% of students stated that Buana Online Courses were quite important in improving their ESP skills. This result can be affected by various factors, including the variety of methods provided by ESP Engineering teachers in online learning media and the role of the teacher in facilitating student learning. The results of this study are supported by research conducted by Synekop, Lytovchenko, Lavrysh, and Lukianenko (2024) on engineering students, which stated that the use of the Moodle LMS with the application could improve students' reading and speaking skills.

Figure 1 illustrates the levels of satisfaction with the Buana Online Course.
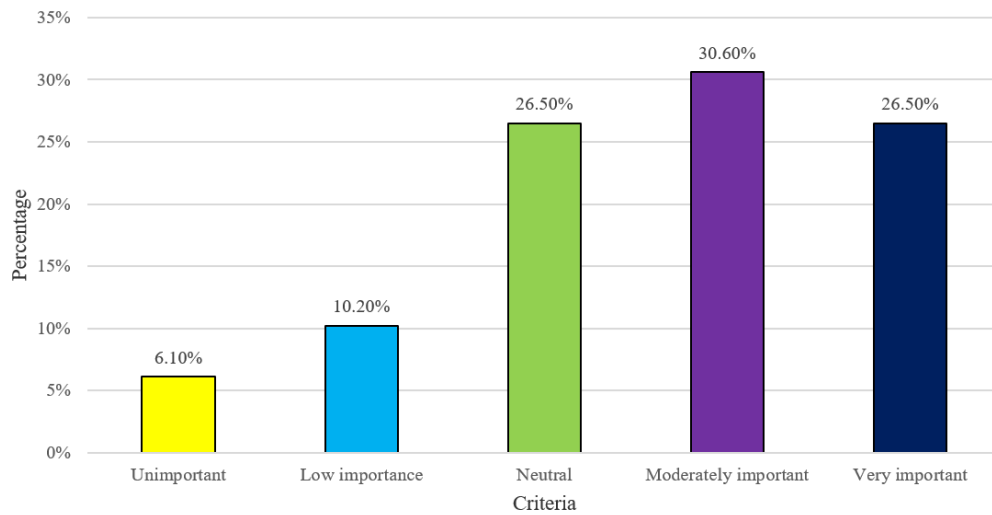
Figure 1. Perceived effectiveness of the Buana Online Course.

4.3. Satisfaction with the Buana Online Course Content

Regarding the content satisfaction of the BOC, 36.70% of the students were very satisfied with the content provided by BOC to support ESP learning, 34.70% were neutral, 14.30% were extremely satisfied, 10.20% were slightly satisfied, and 4.10% were not satisfied at all. The content provided by BOC includes learning videos, learning modules, writing practice, and vocabulary pronunciation. A variety of learning methods can facilitate various improvements of ESP skills to support student satisfaction with BOC learning content. This is in line with research conducted by Arnó-Macià, Aguilar-Pérez, and Tatzl (2020) regarding the effectiveness of using various methods in ESP learning, who showed that engineers require both technical and business English skills to build customer loyalty and networks in the competitive high-tech industry.

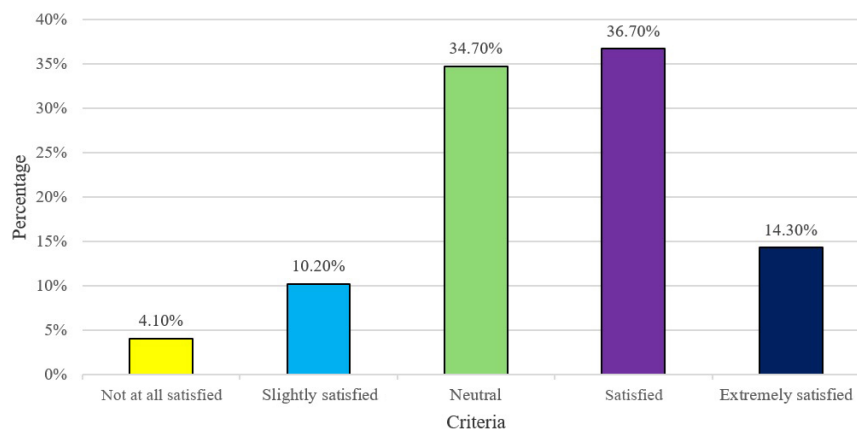Figure 2 illustrates the improvement in understanding and using engineering terminology.

Figure 2. Satisfaction with Buana online course content.

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4.4. Improvement in Understanding and Using Engineering Terminology

The research showed that 34.70% of students who felt their English skills had increased and students who felt neutral toward improving their English skills showed an identical figure. Enhanced understanding of English in a technical context is also affected by students' fundamental ability to understand English in general. Features in Buana online courses that have accomplishments do not adjust to differences in capabilities and needs that influence students' understanding of ESP learning materials. The results of this study are supported by research conducted by Kang (2022), who stated that English programs must be designed using a video and learning management system.

Figure 3 explains the improvement in understanding and using engineering terminology.
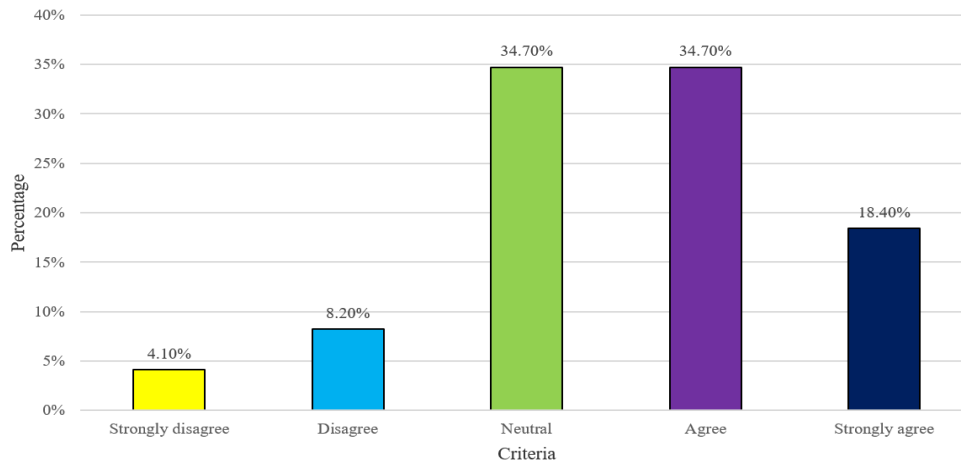
Figure 3. Improvement in understanding and using engineering terminology.

4.5. Confidence in Applying Language Skills in an Engineering Context

Most students stated that they are not confident enough to apply their English skills in a technical context. The survey results showed that as many as 40.80% of the students were not confident using English in the context of learning engineering. ESP learning practices for engineering students should be a priority for teachers in developing a learning syllabus. The Digital Videos Feature Project is an effective method for encouraging students to be more confident in writing reports in the context of ESP, to be more skilled at becoming speakers on related topics, to increase their knowledge regarding ESP, and to strengthen their social relationships by communicating in technical contexts (Chan, 2024).

Figure 4 shows the results related to the students' confidence applying language skills in an engineering context.
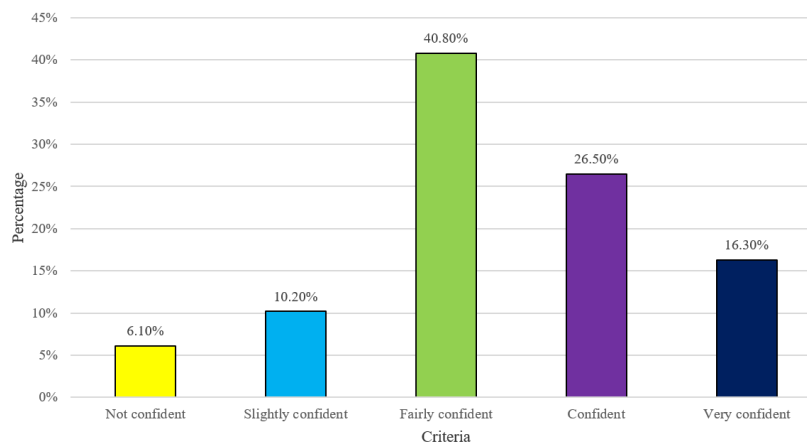

Figure 4. Confidence in applying language skills in an engineering context.

4.6. Enhancement in Reading Comprehension of Engineering-Specific Texts

Most students showed that improving reading skills were crucial in the process of learning English for specific purposes in engineering studies. This opinion is evidenced by 46.90% of students who feel that reading comprehension needs to be involved in BOC learning media. The literature review method is a solution that teachers can use to hone special English reading skills for engineering students.

Figure 5 illustrates the enhancement in reading comprehension of engineering-specific texts.
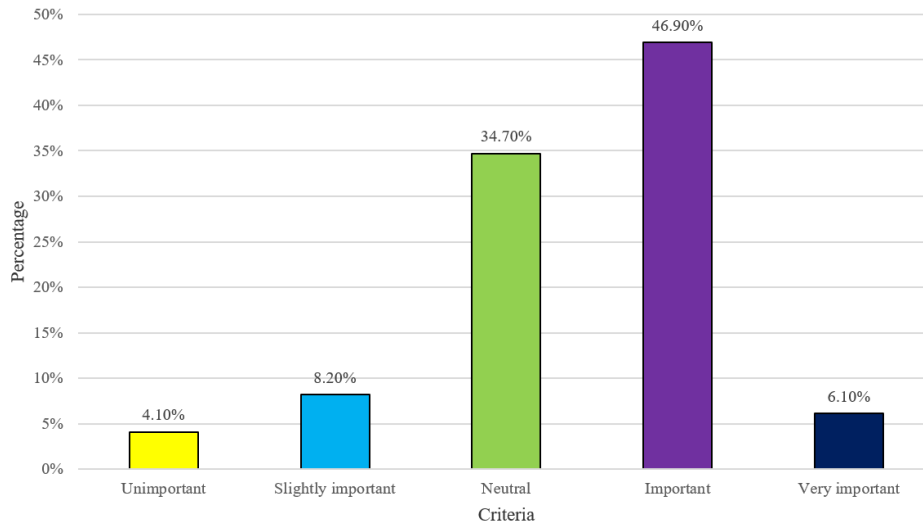
Figure 5. Enhancement in reading comprehension of engineering-specific texts.

4.7. Development of Writing Skills for Technical Reports and Research Papers

As many as 38.80% of the students stated that using BOC media in studying ESP increased their writing skills effectively in industrial engineering. Students who study ESP at the university consider the learning management system to be the most appropriate media to improve their academic writing skills because the tasks given by the teacher require more writing (García-Pinar, 2022).

Figure 6 illustrates the development of writing skills for technical reports and research papers.
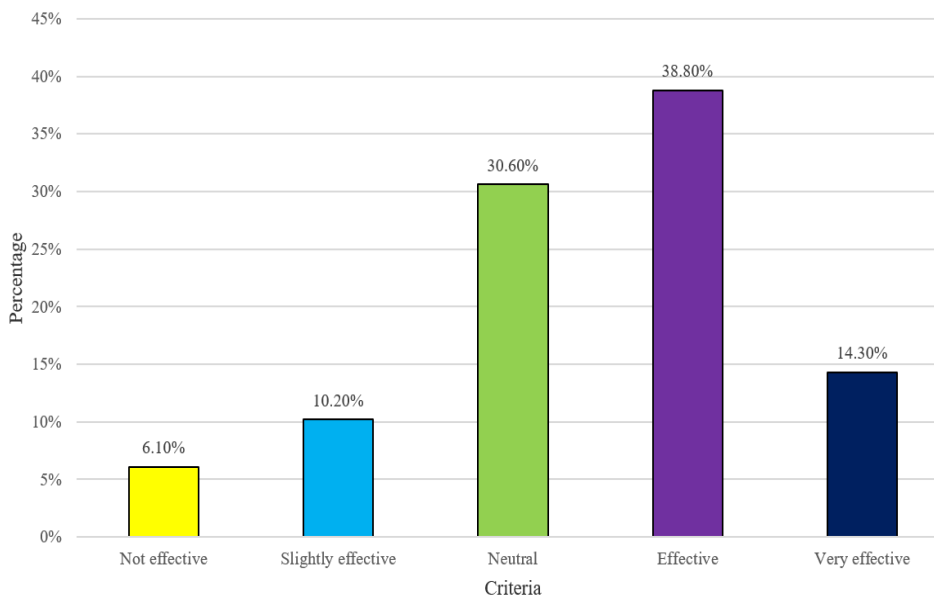

Figure 6. Development of writing skills for technical reports and research papers.

4.8. Improvement in Oral Communication Skills for Engineering-Related Discourse

Improving English language skills is considered important by ESP learning on BOC media. As many as 38.80% of students agree that the development of oral communication is something that needs to be further developed in BOC. Marden and Herrington (2022) state that in online learning a project is needed that allows students to be able to interact with each other and develop oral communication skills.

Figure 7 illustrates the results regarding improvement in oral communication skills for engineering-related discourse.
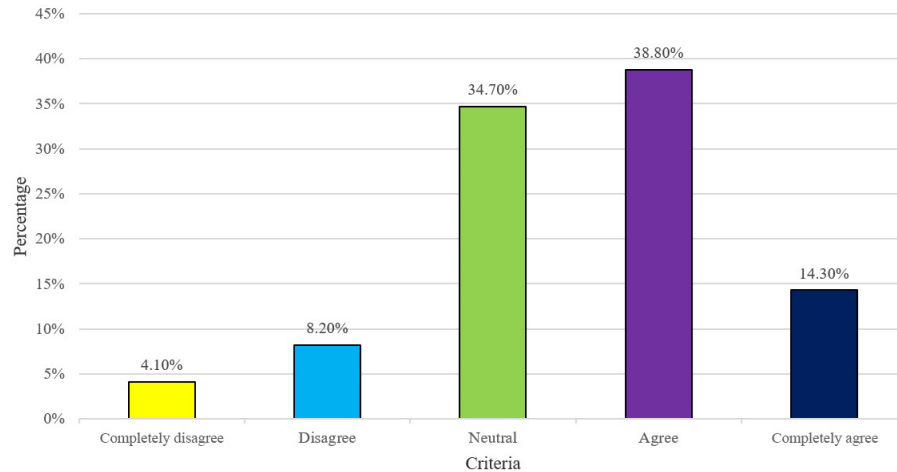
Figure 7. Improvement in oral communication skills for engineering-related discourse.

4.9. Value of Feedback and Assessments in the Buana Online Course

As many as 40.80% of the students stated that they needed to provide feedback on ESP learning using BOC media. Feedback and assessment on learning management systems are needed so that teachers can develop a framework concept that focuses on the needs of students from online courses and adequate facilities that can support the ESP learning process in engineering studies (Suswanto, 2020).

Figure 8 shows the results regarding the value of feedback and assessment in the Buana online mobile course.
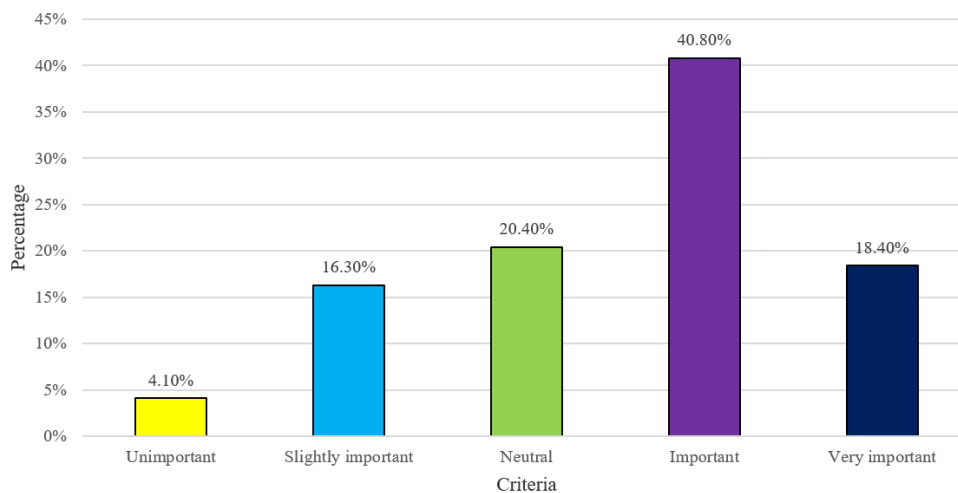

Figure 8. Value of feedback and assessment in the Buana online mobile course.

4.10. Understanding of Cross-Cultural Communication Aspects in Engineering

As many as 40.80% of the students showed that the BOC online learning management system may be one of the learning media that can increase understanding of the cross-cultural aspects among engineering students. The cross-cultural concept needs to be considered in the ESP learning process because it will benefit engineering

students to apply their abilities in the workplace. Understanding cross-cultural communication will guide students in communicating with their colleagues (Parlindungan & Rodgers, 2022).

Figure 9 illustrates the understanding of cross-cultural communication aspects in engineering.
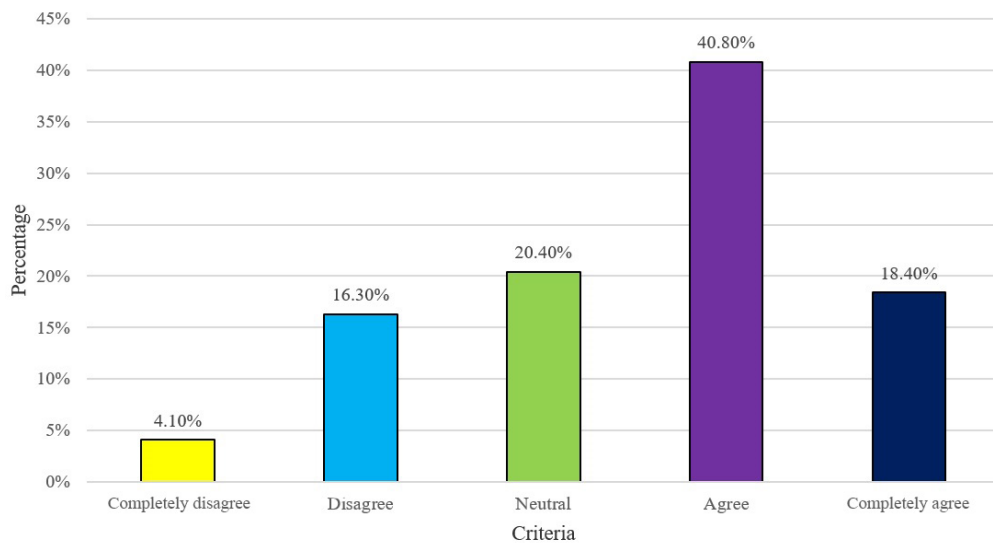

Figure 9. Understanding of cross-cultural communication aspects in engineering.

4.11. Recommendations and the Likelihood of Recommending the Buana Online Course

The results of this study indicate that 42.90% of the students chose to be neutral in terms of recommending the BOC to other students studying ESP via the BOC.

Figure 10 illustrates the recommendations and likelihood of recommending the Buana online course.
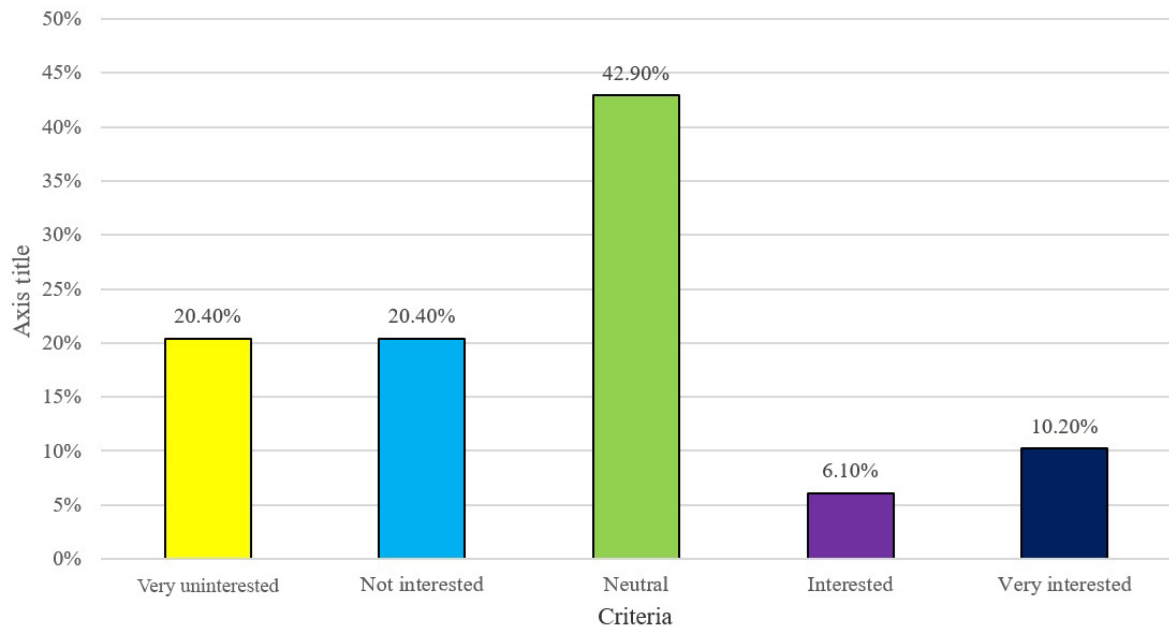

Figure 10. Recommendations and likelihood of recommending the Buana online course.

5. CONCLUSION

5.1. Summary of Findings

This study found that implementing the Buana Online Course web-based mobile application in teaching ESP (English for specific purposes) engineering courses proved to be effective in improving English language skills that support the learning process of engineering students, such as reading, writing, and oral communication. Although it

is considered practical, the percentage of effectiveness in using online courses is still below 50%, indicating that using BOC in ESP learning still needs further improvement to have a more effective impact on the English skills of engineering students at Universitas Buana Perjuangan Karawang, Indonesia. The findings also indicate that the use of BOC has not been able to increase students' confidence in independently using English in the context of learning in the industrial engineering department and that the lack of self-confidence among students due to learning courses in the form of LMS such as BOC usually only facilitate one-way communication and does not adequately facilitate interaction between students and teachers or among students.

5.2. Implications of the Study

This research is expected to serve as a reference to developing the BOC in ESP learning at Universitas Buana Perjuangan Karawang, Indonesia. Furthermore, this research can also serve as a guide for teachers when designing ESP in engineering syllabuses to meets students' needs.

5.3. Limitations

This study did not explore qualitative data from each research instrument, which limited the scope of this research to assessing only the effectiveness of using the BOC in learning ESP for engineering. Qualitative data that describes students' perspectives on their experiences using the BOC in learning ESP will provide further information for richer research results.

5.4. Recommendations

Future research should consider demographic factors, respondents' education level, different universities and different engineering programs such as machine engineering, automotive engineering, chemical engineering, or other programs, with a specific focus on students' basic English skills and knowledge. Furthermore, exploring other factors that affect students' perception of the effectiveness of using the BOC in ESP for engineering would be beneficial for future research and can use mixed methods to obtain more comprehensive data to enrich the results.

Hopefully, these findings will make an important contribution to developing Buana web-based courses and learning on mobile devices. It is hoped that the result of this study can guide educators, ESP researchers, stakeholders, Universitas Buana Perjuangan Karawang, Indonesia, and teachers of ESP for engineering to create more effective and engaging learning experiences for engineering students.

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APPENDICES

Survey Questions
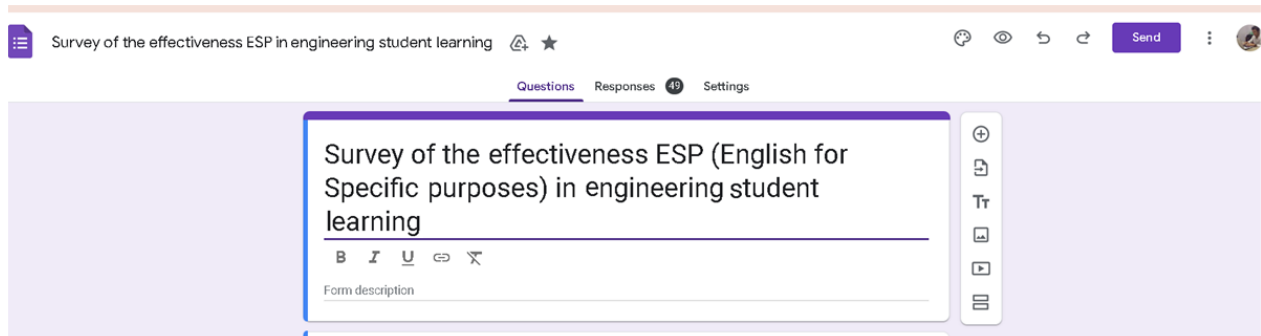
Questions:

1. To what extent do engineering students perceive the Buana Online Courses as effective in improving their English language skills for specific engineering purposes?

2. How satisfied are engineering students with the content provided in the Buana Online Course for ESP (English for specific purposes) in engineering study?

3. To what extent do engineering students agree that the ESP (English for specific purposes) enhances their ability to understand and use English terminology relevant to their field?

4. How confident do engineering students feel in applying the language skills acquired through the ESP (English for specific purposes) learning to communicate effectively in engineering-related contexts?

5. To what extent do engineering students believe that the Buana Online Course improves their reading comprehension skills for engineering-specific texts?

6. How effective is the Buana Online Course in developing engineering students' writing skills for technical reports, research papers, and other engineering-related documents?

7. To what extent do engineering students agree that the ESP (English for specific purposes) learning helps them improve their oral communication skills in engineering-related discussions and presentations?

8. How valuable do engineering students consider the feedback and assessments provided in the Buana Online Course learning for their language development in engineering study?

9. To what extent do engineering students agree that the Buana Online Course facilitates their understanding of cross-cultural communication aspects relevant to the engineering field?

10. How likely are engineering students to recommend Buana Online Courses to their peers pursuing ESP (English for specific purposes) in engineering study?

Source Link: https://docs.google.com/forms/d/e/1FAIpQLSfSU9-WzCLSoNbcuJPWFt_I3Q6Ok7Ew8L-wXvlq6EMxgL-yWg/viewform?vc=0&c=0&w=1&flr=0