A Comparative Study Of Traditional And Blended Learning Approaches To Teaching English For Specific Purposes (Esp) To Engineering Students

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Abstract

The present study investigates the relative efficacy of conventional and blended learning methodologies in the instruction of English for Specific Purposes (ESP) to students pursuing engineering degrees. In light of the significant importance of English language proficiency in technical domains, particularly for individuals who are not native speakers, the objective of this study is to ascertain the most effective approach for improving language proficiency and content understanding. The study employed a mixed-methods methodology, incorporating pre- and post-tests, surveys, including interviews to gather data from a sample of 120 engineering students. The participants were divided into two groups: one group received instruction using traditional methods, while the other group was exposed to a blended learning model. The results of the study indicate that the group that received blended learning shown more significant enhancements in language proficiency, comprehension of content, and level of engagement. The findings of this study indicate that the incorporation of digital resources into traditional classroom teaching methods can offer ESP students a learning experience that is both adaptable and academically successful. This study underscores an opportunity of blended learning in addressing the changing demands of engineering education within a globalised framework.
Keywords: Blended Learning, Engineering Education, English for Specific Purpose, English Language Teaching, Traditional Learning,

Introduction

In the contemporary era of globalisation, the acquisition of English language competence has emerged as a crucial competency for individuals in diverse professional domains, with engineering being particularly prominent. English for Specific Purposes (ESP) is a specialised field of language education designed to address the specific linguistic requirements of learners in particular academic fields or occupations [1]. English for Specific Purposes (ESP) is a course designed to provide engineering students with the essential language skills required to proficiently communicate in technical and professional settings. These competencies encompass the comprehension of technical documentation, active participation in global collaboration, and the effective communication of intricate concepts in a clear and succinct manner. Due to the inherently technical character of engineering, English for Specific Purposes (ESP) plays a pivotal role in facilitating the connection between mainstream English competency and the specialised linguistic demands of the engineering field.

The efficacy of ESP programs relies heavily on the implementation of effective teaching approaches. Conventional pedagogical approaches, commonly distinguished by teacher-led instructional sessions, have historically served as the prevailing norm in the field of education. However, the emergence of digital technology and the growing need for adaptable learning environments have led to the widespread use of blended learning methodologies. [2] Blended learning is an educational approach that integrates conventional in-person teaching methods with digital materials and interactive tools, hence providing a more flexible and dynamic learning environment. This methodology is especially pertinent in the

field of English for Specific Purposes (ESP), because the pragmatic utilisation of linguistic abilities holds equal significance to theoretical understanding.

This study aims to assess and contrast the efficacy of conventional and blended learning methodologies in instructing English for Specific Purposes (ESP) to engineering students. The objective of this study is to assess the efficacy of several instructional approaches in meeting the educational requirements of engineering students, with a specific focus on language competency, topic comprehension, and student engagement. The importance of this study resides in its capacity to provide insights for educational practices in English for Specific Purposes (ESP), specifically within the realm of engineering education, where proficient communication abilities are crucial for achieving professional accomplishments. The results of this study have the potential to offer significant contributions to educators and institutions aiming to improve their English for Specific Purposes (ESP) programs and effectively equip students with the necessary skills for the global engineering workplace.

Blended learning refers to a structured educational approach that integrates both online and in-person instructional methods [3]. It is a mode of education wherein students are provided with in-person instruction, and the curriculum is disseminated through both physical campus locations and online platforms. Blended learning is a method of teaching that integrates conventional face-to-face teaching with contemporary Internet or online instruction. It is widely regarded as the most suitable platform for the 21st century due to its ability to foster innovation, effective communication, critical thinking, problem-solving skills, collaborative abilities, and technology proficiency among students. Based on scholarly sources, blended learning is an instructional approach that integrates traditional in-person classroom teaching with online learning. This methodology can manifest in several formats, encompassing predominantly online courses that incorporate certain face-to-face elements, as well as programs that largely involve in-person instruction but supplement learning with resources available online. This pedagogical approach offers students the advantages of adaptability, customisation, and engagement, and has demonstrated notable enhancements in their scholastic achievements.

Since 2020, blended instruction has become the prevailing approach on a global scale. This pedagogical approach integrates two teaching methodologies by employing efficient instructional design and technology. Furthermore, this approach leverages the advantages offered by both instructional modes, including the flexibility of learning time and space, convenient access to and sharing of resources, and enhanced interaction. There is a perspective among scholars that mixed learning holds significance as an instructional approach that addresses the limitations associated with both conventional classroom settings and purely online learning.

Blended instruction is an innovative approach aimed at improving pedagogy, enabling educators to critically analyse and adapt their instructional strategies. Both offline and online learning are advantageous, since they allow students the flexibility to select their preferred study time and location. The use of interactive internet components serves to enhance participation and foster engagement. The implementation of blended education enables students to engage in independent study of subjects while receiving guidance from instructors. Moreover, the implementation and design of this approach may vary across many educational settings. The efficacy of blended instruction in enhancing student learning and cultivating 21st-century abilities has been the subject of scholarly investigation.

Based on existing research, blended learning has been found to offer advantages to both students and teachers through the facilitation of personalised learning experiences. Online components provide students the opportunity to tailor their learning experiences according to their own requirements and preferences, and online tools and resources equip students with a wider array of learning materials and opportunities compared to those available in a conventional classroom setting. The implementation of blended learning has been found to enhance student engagement and performance, while also promoting student involvement and academic progress. Online assessments and exercises have the potential to aid students in the identification of areas of weakness and facilitate the adjustment of their learning strategies. A blended learning approach offers students enhanced flexibility by enabling them to conveniently access course materials through online platforms at their convenience and engage in self-directed study as required. In addition, blended learning affords students increased autonomy and ample opportunity to get constructive feedback.

The concept of academic motivation encompasses a student's ability to attain both long-term and short-term academic objectives. Furthermore, it is evident in the form of enthusiasm and a favourable disposition towards the process of acquiring knowledge. Motivated students exhibit a higher propensity to complete their assignments and acquire advanced competencies. The concept of "academic motivation" pertains to the disposition, inclination, and aptitude of a student towards academic subjects. Furthermore, it influences behaviours associated with academic achievement, including students' level of effort, management of workload, engagement in activities, and persistence.

Literature Review

The adoption of blended learning has gained significant traction in the realm of higher education owing to its perceived capacity to enhance students' academic enthusiasm for learning achievements. Academic research has been conducted to examine the consequences of blended learning on student learning and motivation. For instance, an investigation was undertaken to assess the impact of blended learning on the academic performance and motivation of students in higher education. Based on the findings of their research, it was observed that the implementation of blended learning significantly enhanced both student academic achievement and motivation in comparison to conventional in-person teaching methods. Furthermore, it has been demonstrated that the implementation of blended learning has a positive impact on academic achievement, critical thinking skills, and problem-solving capabilities. Furthermore, it augmented student engagement and participation in the learning process. Moreover, an assessment was conducted to determine the influence of blended learning on students' academic motivation. The findings revealed that blended learning did indeed enhance students' intrinsic motivation, self-efficacy, as well as fascination in the subject matter of the course [3]. A thorough examination of 77 scholarly research pertaining to blended learning has demonstrated its potential to promote student accomplishment, engagement, and satisfaction, particularly when online activities are meticulously designed to supplement and augment traditional in-person instruction. Furthermore, the review revealed that blended learning has the potential to yield advantages for students from diverse backgrounds and with varying learning needs due to its capacity for differentiation, individualisation, and self-paced learning [4]. In light of the research findings, it is evident that blended learning has a significant impact on the academic achievement and overall satisfaction levels of college students. The research findings revealed a notable enhancement in engagement and fulfilment among learners inside online courses that implemented blended learning strategies [5]. An investigation on the influence of blended learning on the scholastic achievement of university students pursuing a business statistics curriculum revealed that students who engaged in the blended learning approach exhibited significantly superior performance compared to their counterparts who solely received conventional in-person instruction [6].

A prior investigation explored the effectiveness of blended learning in fostering academic achievement among Korean university students. The study found that the implementation of the blended learning technique effectively motivated and regulated pupils, resulting in increased academic performance. Analysis revealed that flipped classrooms had a significant impact on the academic motivation of Korean college students [7], [8]. The implementation of blended learning has been found to have a positive impact on the academic performance of Chinese college students. This approach has been shown to enhance students' self-esteem, drive to engage in autonomous learning, and overall perception of their learning experience.

Furthermore, a number of additional studies have shown evidence that blended learning has a favourable impact on learners' learning attitudes [9]. These effects include the enhancement of learners' motivation to learn, the promotion of their adaptability and self-assurance, and the improvement of their work-group skills and attitudes. Hence, the implementation of blended learning strategies has been shown to promote student engagement and improve their overall learning experience. Blended learning contributes to the empowerment of students through the enhancement of their communication skills, critical thinking abilities, problem-solving aptitude, and technological literacy credentials.

Based on the findings of the study, it can be inferred that blended learning exhibits promise as a viable strategy for fostering student motivation. Furthermore, it is plausible that this approach could facilitate the development of students' self-motivation, self-control, and self-confidence, hence potentially enhancing their academic performance. By integrating the advantages of traditional in-person instruction with the adaptability and customisation offered by online learning, it has the potential to significantly enhance students' academic motivation and performance [10]. Moreover, this approach facilitates a more profound engagement with the subject matter, ultimately leading to exceptional levels of achievement. However, the effects of combined instruction on academic motivation to learn outcomes remain incompletely understood, thereby necessitating further investigation in this domain. An empirical investigation revealed that the implementation of blended learning in higher education had a favourable impact on students' academic motivation [11]. However, it was found that the extent of this effect was dependent on the degree of interaction between learners as well as educators. The findings of the study indicate that the integration of conventional and online instructional methods in blended learning can yield significant and streamlined enhancements in students' scholastic performance. However, it is imperative to guarantee that the development and execution and blended learning are based on sound pedagogical principles and take into account the distinct context and requirements of the learners.

Research Methodology
The present study used a mixed-methods research design to investigate the relative efficacy of traditional and blended learning methodologies in the instruction of English for Specific Purposes (ESP) to engineering students. The application of a mixed-methods strategy involves the integration of quantitative and qualitative data, so facilitating a full

comprehension of the effects of each instructional method overall students' language competency, topic comprehension, and engagement.

Research Questions and Hypotheses

Research Question 1: To what extent does the use of a blended learning strategy yield superior improvements in language competence among engineering students compared to conventional instructional methods?

Proposed Hypothesis 1: The implementation of a blended learning approach in engineering education is expected to yield a notable enhancement in language competency among students, as compared to those who receive instruction through conventional means.

Research Question 2: What is the impact of the blended learning strategy on engagement and fulfilment among students in comparison to conventional learning methods?

Proposed Hypothesis 2: Participants in the mixed learning cohort are expected to exhibit greater levels of satisfaction and engagement with their educational encounter in comparison to their counterparts in the traditional learning cohort.

Participants and Participation Environment

A research investigation was carried out at a reputable engineering college, encompassing a sample size of 120 undergraduate students. The participants were evenly distributed into two groups, each consisting of 60 pupils. Study Group A was subjected to conventional instructional techniques, whereas Study Group B engaged in a blended learning methodology. A purposeful sampling technique was employed to guarantee an equal representation of participants in terms of their academic performance, gender, and past exposure to ESP courses

Methods of Instruction

In the traditional learning group, Group A participated in regular in-class sessions where the instructor imparted knowledge through lectures, interactive discussions, and textbook-based assignments that emphasised the acquisition of technical vocabulary and the development of reading comprehension skills. Group B, also known as the blended learning group, was provided with a blend of traditional in-class instruction and integrated online learning modules. The online components encompassed interactive exercises, multimedia information, and forums, so affording students the opportunity to actively participate in the topic at their preferred speed beyond the confines of the classroom

Electronic Data Collection Instruments

The collection of data was conducted through a comprehensive approach that incorporated pre- and post-tests, surveys, as well as interviews [12]. Pre-tests and post-tests were administered to assess the language ability and topic comprehension of students prior to and following the educational period. The assessments encompassed a variety of question formats, such as multiple-choice questions, short-answer questions, and writing activities pertinent to English for Specific Purposes (ESP) situations. Questionnaires were distributed in order to assess the level of student engagement, motivation, & satisfaction with the instructional approaches employed. Furthermore, a series of semi-structured interviews were undertaken with a selected group of students from each cohort in order to obtain more profound understandings of their respective experiences.

Methods for Data Analysis

The quantitative data obtained from the pre- and post-tests were subjected to analysis using paired sample t-tests in order to ascertain the statistical significance of improvements within each group. Additionally, independent sample t-tests were employed to compare the performance comparing the two groups. Descriptive statistics were employed to analyse the survey responses in order to evaluate the overarching patterns in participation and satisfaction. Thematic analysis was employed to analyse the qualitative data obtained from interviews. This method entailed the coding of replies and the identification of significant themes pertaining to students' perspectives of each instructional method. This integrated methodology offered a comprehensive structure for assessing the comparative efficacy of conventional and blended learning in English for Specific Purposes (ESP) instruction.

Results

The findings of this research offer a comprehensive analysis of the efficacy of conventional and blended learning methodologies in instructing engineering students in English for Specific Purposes (ESP). This study presents its findings in two distinct sections: quantitative data obtained from pre- and post-test scores, and qualitative data collected through student questionnaires and interviews.

Quantitative Data: Academic Performance Outcomes

An examination of test scores indicated notable disparities in the linguistic aptitude and understanding of subject matter among students in the conventional learning cohort (Group A) in contrast to those in the blended learning cohort (Group B).

Proficiency in Language

As shown in Table 1, the pre-test scores revealed that both groups exhibited similar levels of English ability prior to the implementation of the intervention. The mean pre-test score for Group A was 62%, but Group B exhibited an average score of 63%, indicating a lack of statistically significant distinction (p > 0.05). Nevertheless, the post-test scores exhibited a significant enhancement in both cohorts, as seen by Group A attaining an average score of 75% and Group B earning an average score of 85%. The statistical analysis revealed a substantial improvement in both groups (p < 0.01). However, it was observed that Group B exhibited a more pronounced increase, indicating that the integrated learning strategy had a more pronounced effect on boosting language proficiency.

Table 1: Language Proficiency Scores (Pre-Test and Post Test)

Group	Pre-Test Mean Score	Post-Test Mesan Score	Improvement	p-Value
Group A (Traditional)	62%	75%	13%	<0.01
Group B (Blended)	63%	85%	22%	<0.01

Comprehension of Content

Comparable patterns were noted in the analysis of content comprehension scores. Table 2 shows the Content Comprehension Scores. The mean content comprehension score of Group A exhibited a significant improvement, rising from 60% throughout the pre-test to 72% in the post-test. In contrast, the scores of Group B exhibited an improvement, rising from 61% to 82%. The statistical analysis revealed a significant difference in the level of progress between the two groups (p < 0.01), suggesting that students in the blended learning group had a superior comprehension of technical knowledge pertaining to their engineering studies.

Table 2: Content Comprehension Scores (Pre-Test and Post-Test)

Group	Pre-Test Mean Score	Post-Test Mesan Score	Improvement	p-Value
Group A (Traditional)	60%	72%	12%	<0.01
Group B (Blended)	61%	82%	21%	<0.01

Qualitative Data: Analysis of Survey and Interview Feedback

The inclusion of qualitative data obtained from student surveys and interviews has yielded further perspectives on the efficacy of the two instructional methodologies, with a specific emphasis on student engagement, satisfaction, and perceived advantages.

Enhancing Student Engagement

The findings of the survey indicated that students belonging to Group B exhibited greater levels of involvement in comparison to those in Group A. Around 85% of students belonging to Group B expressed that the implementation of a blended learning strategy resulted in increased levels of engagement during the learning process. This was attributed to the diverse range of online resources available and the ability to learn at a self-determined pace, which were identified as significant considerations. In contrast, a mere 60% of students in Group A reported experiencing comparable levels of engagement, with a significant number indicating a preference for learning resources that are more interactive and diversified in nature.

Satisfaction

Furthermore, the blended learning strategy was shown to have achieved greater levels of satisfaction ratings. The survey results indicate that almost 80% of students in Group B expressed satisfaction with the course organisation and material delivery, in contrast to 65% of students in Group A. One of the primary benefits emphasised by students in Group B was the capacity to revisit online resources and engage in interactive forums. In contrast, students belonging to Group A highlighted the constraints associated with conventional approaches, including the absence of personalised instruction and restricted avenues for engaging in interactive educational experiences.

Perceived Advantages

The findings from the interviews indicated that students belonging to Group B had a higher level of preparedness in terms of practically applying English language skills within engineering settings. The blended learning approach was valued by the participants for its ability to offer practical language skills through the utilisation of online simulations and case studies that directly reflected real-life professional situations. The students belonging to Group A, although recognising the significance of conventional approaches in establishing a strong basis, articulated a preference for additional pragmatic implementations and digital resources to augment their educational progression.

A Comparative Analysis of Groups

The comparative analysis of the traditional and blended learning groups reveals that the blended learning approach exhibited greater efficacy in enhancing language competency, material comprehension, and student engagement [13]. The analysis of the quantitative data revealed significant enhancements in test scores among the participants who engaged in blended learning. Additionally, the qualitative feedback highlighted the elevated levels of engagement and satisfaction that were linked to the implementation of the blended method. The results of this study indicate that the integration of conventional teaching methods with digital resources presents a more efficient and captivating educational encounter for English for Specific Purposes (ESP) students in the field of engineering. This approach enhances their ability to acquire the necessary competencies for their prospective professional endeavours.

Conclusion

This study provides evidence that the use of blended learning methodologies has a substantial positive impact on the teaching of English for Specific Purposes (ESP) to engineering students, in comparison to conventional instructional approaches. The research findings underscore the efficacy of blended learning, a pedagogical approach that integrates traditional face-to-face instruction with digital resources, in fostering significant enhancements in language proficiency, topic comprehension, and student engagement. Individuals that were exposed to a mixed learning approach demonstrated improved performance on post-test assessments and displayed a heightened comprehension of technical subject matter. Additionally, they displayed increased levels of engagement and pleasure. The incorporation of digital elements, such as interactive exercises highly multimedia resources, has afforded students a learning environment that is both adaptable and captivating, thereby harmonising with the changing requirements of contemporary classroom instruction. The aforementioned findings highlight the capacity of blended learning to cater to the distinct linguistic requirements of engineering students, presenting a more flexible and efficient method for instructing English for Specific Purposes (ESP). This research study provides significant contributions to educators and institutions seeking to enhance English for Specific Purposes (ESP) programs. It proposes that a blended learning approach, which integrates traditional and digital learning approaches, can effectively prepare students for success in global engineering contexts.

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