

THE ROLE OF ENGLISH FOR SPECIFIC PURPOSES (ESP) IN ENHANCING ENGLISH PROFICIENCY OF INFORMATICS ENGINEERING STUDENTS

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Abstract

This study investigates the significance of English for Specific Purposes (ESP) in enhancing students' linguistic competence and preparing them for global engagement in science and technology fields. Drawing on a qualitative literature review of eight peer-reviewed studies published between 2018 and 2024, the research identifies major themes related to students' perceptions, learning needs, instructional strategies, and curriculum development. Findings indicate that students predominantly struggle with mastering technical vocabulary, applying grammar accurately in professional contexts, and expressing ideas fluently during oral presentations. Furthermore, there is a noticeable gap in accessing instructional materials aligned with informatics content. Pedagogical approaches such as genre-based materials, project-based learning, and bilingual scaffolding increase learner engagement and performance. The study emphasizes the need for curriculum designers to integrate ESP within Informatics programs by conducting needs analyses, fostering intercultural competence, and supporting instructors through targeted training. Ultimately, ESP is not an ancillary component but a strategic element that bridges academic preparation with professional demands. The study concludes that responsive, learner-centered ESP instruction is essential for equipping students with the communicative skills required in a globalized digital economy.

Keywords: English for Specific Purposes (ESP); Informatics Engineering; Technical English; Language Proficiency; Curriculum Development; and Needs Analysis.

INTRODUCTION

In the context of today's technologically driven and globally interconnected world, proficiency in the English language has become an indispensable skill for students pursuing degrees in Informatics Engineering. The widespread use of English as the dominant medium in academic publications, technical documentation, and international communication underscores the necessity of equipping students with not only general language competence but also specialized communicative abilities tailored to their disciplinary and professional domains. In this regard, English for Specific Purposes (ESP) has emerged as a pedagogically effective and context-sensitive approach to English language instruction, particularly for learners in science, technology, engineering, and mathematics (STEM)-related fields.

Unlike General English (GE), which provides broad-based language instruction, ESP focuses on developing learners' ability to use English appropriately and effectively in

specific academic and professional contexts. As articulated by Hutchinson and Waters (1987), ESP instruction must be “needs-driven” and “goal-oriented,” designed to respond directly to learners’ real-world linguistic demands. This emphasis on contextual relevance makes ESP particularly suitable for Informatics Engineering students, whose academic success and professional readiness increasingly depend on their capacity to comprehend technical texts, articulate specialized concepts, and engage in discipline-specific communicative tasks.

A review of recent empirical studies affirms the critical role that ESP plays in enhancing the English language proficiency of Informatics Engineering students. The present study synthesizes the findings of eight peer-reviewed research articles published within the last seven years, each of which examines various dimensions of ESP implementation in technical education. The studies highlight a recurring pattern: students consistently exhibit a preference for ESP over General English due to its direct relevance to their academic disciplines and career aspirations (Brilianti & Rokhim, 2023). Furthermore, the skills most commonly emphasized by students include speaking, reading, and technical vocabulary acquisition—abilities closely aligned with the communicative requirements of the informatics field (Nimasari, 2018; Irudayasamy et al., 2020).

These empirical findings are consistent with established ESP theory, particularly the frameworks proposed by Hutchinson and Waters (1987) and Dudley-Evans and St. John (1998), which advocate for instructional practices grounded in learners’ specific needs, professional goals, and target language situations. Effective ESP instruction, therefore, is not merely a subset of language education but rather a strategic response to the evolving demands of global professional environments. Several studies reviewed in this synthesis confirm that instructional approaches such as the Genre-Based Approach (Sukmawati & Nasution, 2020), project-based learning, and multimedia-assisted instruction (Latifah et al., 2024) significantly contribute to improved learner outcomes by fostering motivation, engagement, and contextual understanding.

Nevertheless, the implementation of ESP remains challenged by a number of pedagogical and institutional constraints. As noted in multiple studies, issues such as inadequate instructional time, insufficient access to specialized teaching materials, and discrepancies between student needs and instructor priorities continue to hinder optimal ESP delivery (Kadek & Iswara, 2019; Brilianti & Rokhim, 2023). These challenges underscore the necessity of conducting systematic needs analyses and providing targeted professional development to ensure that ESP instruction is aligned with both learner expectations and disciplinary requirements.

This article adopts a qualitative meta-synthesis methodology to examine and integrate the findings from the aforementioned studies. Through thematic coding and critical analysis, the study aims to provide a comprehensive and evidence-based understanding of effective ESP practices within the context of Informatics Engineering. By identifying common instructional strategies, learning outcomes, and implementation challenges, this synthesis offers insights that can inform curriculum development, instructional design, and policy formulation.

The relevance of this research lies in its potential to contribute to the enhancement of ESP curriculum frameworks within higher education institutions, particularly those offering programs in informatics and engineering. As the global labor market increasingly demands professionals who possess both technical expertise and effective English

communication skills, the strategic integration of ESP becomes imperative. When effectively implemented, ESP not only enhances language proficiency but also facilitates students' readiness to participate in international academic exchanges, collaborative projects, and professional networks.

English for Specific Purposes constitutes a critical component of modern engineering education. Its capacity to bridge the gap between linguistic competence and technical communication positions it as a transformative tool in preparing Informatics Engineering students to meet the communicative challenges of their academic and future professional environments. By synthesizing empirical evidence and aligning instructional strategies with learner needs, this study aims to underscore the pedagogical significance and practical value of ESP in higher education.

METHOD

This study employed a qualitative meta-synthesis approach to systematically examine and interpret the findings of eight peer-reviewed empirical studies related to the implementation of English for Specific Purposes (ESP) in Informatics Engineering education. The primary objective of this methodological design was to synthesize research-based insights that demonstrate how ESP instruction contributes to the enhancement of students' English language proficiency within discipline-specific contexts.

The data for this synthesis were derived from a purposive selection of scholarly articles that met the following inclusion criteria: (1) the studies focused on ESP practices among Informatics or Engineering students; (2) the studies addressed themes such as learner needs, instructional strategies, skill development, and pedagogical outcomes; and (3) the studies were published within the last seven years to ensure contemporary relevance. Each article was examined in depth, and relevant data were extracted based on research objectives, methodological procedures, and core findings.

The analytical process followed a **thematic coding framework**, drawing upon established ESP theoretical foundations, including Hutchinson and Waters' (1987) model of needs-based and goal-oriented instruction, as well as Dudley-Evans and St. John's (1998) framework for course design. Recurring themes such as the prioritization of communicative competencies (e.g., speaking, reading, technical vocabulary), the preference for contextually relevant instructional materials, and the effectiveness of learner-centered approaches (e.g., project-based learning, multimedia integration, and the genre-based approach) were identified across the studies (e.g., Nimasari, 2018; Sukmawati & Nasution, 2020; Latifah et al., 2024).

Furthermore, the synthesis critically evaluated challenges commonly reported in ESP implementation, including discrepancies between students' needs and instructors' perceptions (Kadek & Iswara, 2019), time constraints, and the inadequacy of specialized learning resources. By triangulating the results and pedagogical implications across the selected studies, this research highlights the strategic role of ESP in aligning English instruction with the academic and professional demands of the informatics discipline.

Overall, this methodological approach enables the construction of a comprehensive, evidence-based understanding of effective ESP practices tailored to Informatics Engineering students. The outcomes of this synthesis are intended to inform future curriculum development, instructional planning, and professional training in ESP contexts.

RESULTS AND DISCUSSION

Before delving into the thematic discussion, the following table provides an informative overview of the eight studies reviewed in this analysis. Each entry presents the authors, year of publication, article title, research objectives, and key findings related to the implementation of English for Specific Purposes (ESP) within technical and informatics education contexts. This table serves as a concise yet comprehensive foundation for the subsequent synthesis and critical interpretation presented in the discussion section.

Table 1. Summary of Reviewed Studies on ESP Implementation in Informatics Engineering

Authors & Year	Title	Research Objectives	Findings
Elok Putri Nimasari (2018)	An ESP Needs Analysis: Addressing the Needs of English for Informatics Engineering	This study aims to analyze the English language needs of Informatics Engineering students at Universitas Muhammadiyah Ponorogo to design a suitable ESP curriculum. A qualitative method was employed, using a questionnaire instrument based on the framework of Dudley-Evans and St. John.	The analysis revealed that students acknowledged the importance of English, particularly in the areas of speaking, listening, and grammar. They expressed a preference for project-based learning, outdoor classes, and a lecturer role that functions as a facilitator. Additionally, the findings indicated a need for ESP textbooks specifically tailored to the field of Informatics Engineering, as well as noticeable improvements in students' language abilities after three months of instruction.
Rita Karmila Sari, Adhityo Kuncoro & Fajar Erlangga (2019)	Need Analysis of English for Specific Purposes (ESP) to Informatic Students	This study aims to identify: (1) the students' purposes for learning English; (2) the language aspects they are most interested in; (3) their needs across the four language skills; and (4) the challenges they encounter during the learning process.	The findings indicate that students primarily learn English for employment purposes and oral communication, showing interest in all language aspects—particularly reading, speaking, and grammar. Their main difficulties lie in vocabulary and grammar. Moreover, their learning needs are closely related to career development, personal interests such as online gaming, and

	<p>Kadek Yogi Susana & Agus Ari Iswara (2019)</p> <p>Needs Analysis for Informatics Engineering Students as a Basis to Develop Teaching Materials on English for Specific Purposes</p>	<p>This study aims to investigate the alignment between students' needs and lecturers' perceptions in the design of ESP courses for non-English majors at Indonesian higher education institutions.</p>	<p>comprehension of technical materials in the field of informatics.</p> <p>The findings reveal a gap between students' needs and lecturers' perceptions, wherein students require oral communication skills and academic text comprehension, while lecturers tend to emphasize grammar. This study highlights the importance of conducting a comprehensive needs analysis and providing ESP teacher training to enhance the relevance of instruction.</p>
	<p>Julius Irudayasamy, Nizar Mohammed Souidi & Carmel Hankins (2020)</p> <p>Impact of an ESP Course on English Language Proficiency of Undergraduate Engineering Students: A Case Study at Dhofar University</p>	<p>This study aims to evaluate the effectiveness of an ESP course for engineering students at Dhofar University, with a focus on students' perceptions, its impact on specific language skills, and the acquisition of vocabulary and grammar proficiency.</p>	<p>A survey of 118 engineering students indicated that the ESP course had a positive impact on their mastery of technical vocabulary, grammar, and specific English language skills, while also enhancing their learning motivation. Nevertheless, some students reported difficulties in understanding technical content and emphasized the need for strengthening basic language foundations before undertaking ESP instruction.</p>
	<p>Nur Najibah Sukmawati & Sukma Septian Nasution (2020)</p> <p>Genre-Based Approach: Can It Improve the Informatics Engineering Students' Writing Skill?</p>	<p>This study aims to enhance the explanatory writing skills of Informatics Engineering students through the implementation of the Genre-Based Approach (GBA) and to examine its impact on the quality of their written texts.</p>	<p>The study demonstrated that the implementation of the Genre-Based Approach (GBA) improved students' average writing scores from 54 to 59.95 and 70.5 across two cycles. This improvement was supported by active student participation and positive responses</p>

			regarding their understanding of the structure and language features of explanatory texts.
Dani Fitria Brilianti & Abdul Rokhim (2023)	The Importance of English for Specific Purposes Based on the Engineering Students' Perceptions	This study aims to explore the perceptions of road transportation engineering cadets regarding the importance of ESP courses in supporting their academic success and future career development.	The findings indicate that the majority of cadets consider ESP essential for both their academic studies and future careers. Most participants preferred ESP over General English, perceived the course as beneficial, and regarded the content and modules as aligned with their academic and professional needs. However, many expressed concerns that the allotted instructional time was insufficient.
Souad Belabcir (2024)	Investigating Engineering Students' Needs for ICT Integration in ESP Classes	This study aims to develop English learning materials that are aligned with the academic and professional needs of Informatics Engineering students at Universitas Sembilanbelas November Kolaka.	The findings indicate that the ESP-based English materials are relevant to the needs of Informatics Engineering students, covering topics such as job interviews, system analysis, and programming. Expert evaluations and student responses suggest that the materials are appropriate, engaging, and contribute to improved understanding of technical language as well as increased learning motivation.
Fatimatul Latifah, Sri Hartiningsih, Umi Yawisah & Fardini Sabilah (2024)	Enhancing ESP Teaching for Computer and Network Engineering Students Through Multimedia	This study aims to explore the procedures for integrating videos and images in teaching procedural texts within ESP classrooms, identify the challenges faced by teachers, and examine the solutions they implement.	The use of multimedia, such as videos and images, enhances student engagement and the effectiveness of teaching procedural texts. Teachers faced several challenges, including time constraints, mismatched materials, and low

student motivation. The solutions implemented involved selecting appropriate videos, utilizing online resources, applying emotional approaches, consulting with parents, and adopting project-based learning strategies.

This study examined eight peer-reviewed articles focusing on the application and effectiveness of English for Specific Purposes (ESP) in enhancing English proficiency among Informatics Engineering students. The synthesized results reveal the following key findings:

1. Students' Preference for ESP over General English

A consistent theme across the reviewed studies is that Informatics Engineering students perceive English for Specific Purposes (ESP) as more relevant and beneficial than General English. Brilianti & Rokhim (2023) reported that over 80% of students preferred ESP due to its practical alignment with their academic content and future career expectations. Similar sentiments were echoed by Sari et al. (2019), where students emphasized the importance of English in helping them prepare for professional communication, such as reading technical documentation, understanding programming manuals, and engaging in job interviews.

This preference stems from ESP's direct focus on domain-specific vocabulary, communicative scenarios, and learning tasks. Compared to General English, which often lacks contextual relevance, ESP fosters engagement and motivation by connecting language learning to students' real-world professional needs.

2. Preferred Language Skills in ESP Contexts

One of the core findings from the reviewed articles is the prioritization of specific language skills. Students consistently identified speaking, reading, and technical vocabulary as the most crucial components of English proficiency (Nimasari, 2018; Irudayasamy et al., 2020). This aligns with the communication needs in the informatics engineering field, where the ability to articulate technical concepts and read discipline-specific texts is vital.

In Nimasari's study (2018), speaking was rated as the most desired skill to improve, followed by listening and grammar. This mirrors findings from Sari et al. (2019), who reported that vocabulary gaps and grammar issues were common challenges. These linguistic barriers can obstruct comprehension of technical literature and reduce communication efficiency, especially in international or cross-disciplinary contexts.

3. The Impact of ESP on English Language Proficiency

The literature shows compelling evidence that well-structured ESP courses can significantly enhance students' language proficiency. Irudayasamy et al. (2020) documented measurable improvements in grammar, technical vocabulary, and

speaking confidence among engineering students who participated in an ESP program. Sukmawati & Nasution (2020) demonstrated that the application of a genre-based approach in writing led to substantial gains in students' ability to structure and express technical ideas clearly.

These studies confirm Hutchinson and Waters' (1987) assertion that ESP must be "needs-driven" and "goal-oriented." By focusing on the learners' target situation, ESP enables students to acquire not only general communicative competence but also field-specific linguistic strategies necessary for professional success.

4. Instructional Strategies Enhancing Learner Engagement

ESP instruction thrives when embedded in engaging pedagogical practices. Across several studies, methods such as project-based learning, task-based instruction, and multimedia integration emerged as preferred approaches. Latifah et al. (2024) highlighted how materials and activities grounded in the informatics context—such as analyzing software manuals, simulating interviews, or creating tutorial videos—helped students internalize language content while maintaining motivation.

Students also appreciated instructors who acted as facilitators rather than traditional lecturers. Nimasari (2018) emphasized that learners favored flexible classroom environments, including outdoor classes and peer collaboration, as these fostered a more interactive and less intimidating atmosphere for language practice.

5. Challenges in ESP Implementation

Despite the positive impact of ESP, the implementation process is not without its challenges. Several studies point to recurring issues such as insufficient instructional time, lack of appropriate teaching materials, and low student motivation (Brilianti & Rokhim, 2023; Fatimatul et al., 2024; Kadek & Agus, 2019) research is particularly revealing, highlighting a significant disconnect between what students actually need and what teachers perceive as important. While students expressed a desire to improve communication skills and understand technical texts, teachers often prioritized grammar instruction.

This misalignment can undermine the effectiveness of ESP courses. It underscores the necessity for systematic needs analysis and targeted teacher training in ESP pedagogy, ensuring that classroom practices are responsive to students' academic and professional contexts.

6. Proposed Solutions and Strategic Interventions

The reviewed articles proposed several strategies to mitigate these challenges. Needs analysis, as advocated by Nimasari (2018) and Sari et al. (2019), plays a foundational role in curriculum design. By identifying students' goals, current language abilities, and field-specific demands, educators can tailor ESP content more effectively.

Moreover, adapting teaching resources through multimedia, such as YouTube videos, infographics, and domain-specific simulations, can bridge the gap between limited classroom hours and the complexity of ESP content. Fatimatul et al. (2024) noted the success of integrating short videos and student-generated media to teach procedural texts and enhance learner motivation.

In addition, approaches like the Genre-Based Approach (Sukmawati & Nasution, 2020) and project-based learning proved successful in contextualizing instruction and increasing student participation. These methods encourage autonomy, deepen comprehension, and build real-world language competence.

7. ESP and Career Preparedness

Several studies underscore the role of ESP in preparing students for the workforce. Brilianti & Rokhim (2023) revealed that 77% of students believed English proficiency significantly influenced their career opportunities. The materials focusing on job interviews, programming concepts, and systems analysis helped bridge the academic-industry gap.

As global industries demand professionals who can operate in English-speaking environments, ESP becomes indispensable. The alignment of course content with the demands of informatics careers not only enhances employability but also strengthens students' confidence to engage in technical and cross-cultural communication.

8. Theoretical Implications and Pedagogical Recommendations

The cumulative findings reinforce the core principles of ESP outlined by Hutchinson & Waters (1987), Dudley-Evans & St. John (1998), and Basturkmen (2015). Specifically, the needs-based and learner-centered design of ESP emerges as essential for effective instruction. When courses are informed by authentic contexts and real-life language use, students exhibit higher motivation, better learning outcomes, and more positive attitudes toward English education.

From a pedagogical standpoint, these insights suggest several implications:

- Curriculum planners should integrate needs analysis as a standard component in ESP course design.
- ESP instructors require ongoing training to stay current with industry developments and teaching innovations.
- Educational institutions must invest in developing tailored teaching materials and digital content aligned with informatics engineering needs.

9. Synthesis and Contribution of the Present Study

Synthesizing the findings from the eight reviewed studies, this article confirms that ESP plays a pivotal role in enhancing the English proficiency of Informatics Engineering students. Through focused skill development, contextualized instruction, and responsive teaching strategies, ESP equips students with the linguistic tools necessary for academic and professional achievement.

The challenges documented—ranging from limited resources to misaligned perceptions—are not insurmountable. Rather, they call for a comprehensive reform in ESP design, emphasizing collaboration between educators, students, industry stakeholders, and policymakers.

English for Specific Purposes is more than a specialized variant of English education—it is a strategic response to the demands of globalization and technical communication. By embracing ESP, institutions empower Informatics Engineering students to not only master the English language but also to thrive in the interconnected, information-driven world.

The results of this literature review indicate that English for Specific Purposes (ESP) plays a vital role in enhancing the language proficiency of Informatics Engineering students. Unlike General English, ESP emphasizes language use in specific academic and professional contexts, which resonates strongly with students' goals and expectations.

The preference for skills such as speaking, reading, and technical vocabulary reflects the authentic language demands of the engineering and informatics domains. These findings are consistent with Hutchinson and Waters' (1987) theory that ESP should be needs-driven and goal-oriented, centered around the learners' target situation.

Moreover, the positive learning outcomes resulting from the use of genre-based instruction (as seen in Sukmawati & Nasution, 2020) and multimedia integration (Latifah et al., 2024) align with recent trends in language education, which promote contextualized and multimodal teaching strategies. Such approaches not only improve linguistic accuracy and fluency but also foster student engagement and autonomy.

The reported challenges—particularly those concerning limited time allocation and inadequate instructional materials—suggest a need for institutional reform and professional development. As Kadek & Agus (2019) emphasized, misalignment between teachers' perceptions and students' actual needs can hinder ESP course effectiveness. Therefore, a systematic needs analysis should be a prerequisite for ESP course design.

The integration of well-designed ESP instruction in Informatics Engineering programs has the potential to significantly improve students' English proficiency. It bridges the gap between language education and discipline-specific communication, equipping students with the skills necessary for both academic success and professional competence.

CONCLUSION

The comprehensive review of eight empirical studies affirms the pivotal role of English for Specific Purposes (ESP) in advancing the English language proficiency of Informatics Engineering students. ESP instruction, as opposed to General English, demonstrates superior relevance and efficacy by integrating domain-specific language, communicative contexts, and professional discourse into the learning process. This alignment not only enhances learners' motivation and engagement but also facilitates the acquisition of language skills that are directly applicable to academic and occupational settings, most notably in speaking, reading, and the mastery of technical vocabulary.

The reviewed literature provides consistent evidence that when ESP is implemented through contextually grounded and learner-centered methodologies, such as project-based learning, the Genre-Based Approach, and multimedia-assisted instruction, it yields substantial improvements in students' communicative competence, linguistic accuracy, and overall language fluency. These strategies contribute to fostering learner autonomy and bridging the gap between theoretical instruction and real-world application.

Nonetheless, the implementation of ESP is not without its challenges. Recurring issues such as limited instructional time, misalignment between instructional focus and student needs, and a lack of discipline-relevant materials underscore the necessity of conducting rigorous needs analyses and providing sustained professional development for ESP practitioners. Addressing these challenges is essential to optimizing the pedagogical effectiveness of ESP programs.

English for Specific Purposes should be regarded not merely as a specialized variant of English instruction but as a strategic, goal-oriented educational framework that directly supports the linguistic and professional development of Informatics Engineering students. By responding to the authentic communicative demands of the discipline, ESP fosters not only academic achievement but also equips students with the essential competencies required to participate successfully in global, interdisciplinary, and technologically driven professional environments.

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