



A Needs Analysis of English Learning for Informatics Students In The Digital Era

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Abstract

This study investigates the English learning needs of Informatics students to support their academic and professional development in the digital era. A mixed-method descriptive survey design was employed to collect data from 120 first- and second-year Informatics students at YPIB University of Majalengka. Data were gathered through questionnaires, semi-structured interviews, and document analysis. The questionnaire demonstrated high reliability, with a Cronbach's Alpha coefficient of 0.87. The findings reveal that students prioritize reading skills, particularly for understanding programming documentation, technical textbooks, and academic references. Speaking skills, especially for job interviews, workplace communication, and academic presentations, are also perceived as essential for professional readiness. In addition, students heavily rely on English in digital learning environments such as online tutorials, instructional videos, and software documentation. However, major challenges were reported, including limited technical vocabulary and low confidence in speaking English. The study concludes that existing English courses for Informatics students require redesigning to incorporate discipline-specific and digital-era ESP components. These findings not only enrich ESP needs analysis literature in technology-related disciplines but also offer practical guidance for redesigning English curricula responsive to digital-era academic and industry demands.

Keywords: ESP, Needs Analysis, Informatics Students, English for Computer Science, Digital Era

INTRODUCTION

The rapid advancement of digital technology has significantly transformed higher education, particularly in Informatics-related disciplines. Informatics students are increasingly required to access digital learning resources, academic publications, programming documentation, and professional platforms that predominantly use English. As the primary language of science, technology, and global communication, English proficiency has become an essential competence for Informatics students to achieve academic success and to prepare for future professional careers in the digital era.

Previous studies have consistently emphasized the importance of English for students in science and technology fields. Hutchinson and Waters (1987) argue that effective language instruction should be grounded in learners' specific needs rather than general language competence. Similarly, Dudley-Evans and St. John (1998) highlight that English for Specific Purposes (ESP) plays a crucial role in addressing discipline-specific

language demands. More recent research indicates that Informatics and computer science students primarily require English to comprehend technical documentation, academic texts, and specialized vocabulary, while speaking skills are increasingly needed for presentations and workplace communication in technology-driven environments (Anthony, 2018).

In the Indonesian higher education context, several studies report similar concerns. Sulistiyo (2016) and Yundayani (2018) found that English instruction for non-English majors remains largely dominated by General English content, which does not sufficiently address students' academic and professional needs. Mulyadi (2020) further notes that English courses in technology-related programs often fail to integrate language skills relevant to students' disciplinary contexts. Consequently, students frequently experience difficulties in comprehending authentic English materials and applying English effectively in academic and professional tasks.

Empirical research by Hadiyanto (2014) and Siregar (2019) also indicates that students in science and technology disciplines face challenges in mastering technical vocabulary and developing speaking confidence due to limited exposure to discipline-specific English materials. These findings suggest a mismatch between English instruction provided by higher education institutions and the actual language demands encountered by Informatics students.

Despite the growing number of studies on ESP and needs analysis, several research gaps remain. Many previous studies focus primarily on general English skills or emphasize a single language skill, particularly reading, without sufficiently considering the integration of multiple English skills required in digital academic and professional contexts. Moreover, empirical studies that specifically investigate the English learning needs of Informatics students in the digital era within Indonesian higher education remain relatively limited.

This study contributes to ESP research by providing a comprehensive needs analysis framework that integrates academic, professional, and digital learning dimensions specifically for Informatics students in Indonesian higher education. Pedagogically, the findings inform ESP curriculum development that aligns English instruction with real-world digital and workplace demands. Accordingly, this study aims to analyze the English learning needs of Informatics students by examining their necessities, lacks, and learning preferences in the digital era.

METHOD

This study employed a mixed-method descriptive survey design to examine the English learning needs of Informatics students in the digital era. The participants were 120 first- and second-year Informatics students enrolled in compulsory English courses at YPIB University of Majalengka. Convenience sampling was applied due to accessibility and the exploratory nature of needs analysis research.

Data were collected through questionnaires, semi-structured interviews, and document analysis to ensure data triangulation. The questionnaire used a four-point Likert scale ranging from strongly disagree to strongly agree and demonstrated high internal consistency (Cronbach's Alpha = 0.87). Semi-structured interviews were conducted with selected students and English lecturers to explore learning experiences, perceived challenges, and expectations toward English instruction. In addition, relevant course syllabi and instructional materials were analyzed to examine alignment between course content and students' actual English needs.

Quantitative data were analyzed using descriptive statistical techniques, including mean scores, standard deviations, and rankings. Qualitative data from interviews and document analysis were thematically coded and interpreted. Triangulation across data sources was employed to enhance the credibility and trustworthiness of the findings.

RESULTS AND DISCUSSION

This section presents the findings of the study based on descriptive statistical analysis of questionnaire data. The results are organized according to major dimensions of English learning needs among Informatics students.

Academic English Needs

Table 1 presents students' perceptions of their academic English needs.

No.	Item	Mean	SD	Rank
1	Understanding programming manuals and technical textbooks	3.52	0.48	1
2	Reading research articles in Informatics	3.41	0.55	2
3	Understanding English technical terms	3.36	0.51	3
4	Writing academic assignments in English	2.89	0.63	4

As presented in Table 1, students rated understanding programming manuals and technical textbooks as their most important academic English need ($M = 3.52$). This finding corroborates Tsai (2019), who reported that computer science students prioritize reading technical documentation over productive skills. Similar trends have also been observed in Indonesian contexts (Sulistiyono, 2016; Mulyadi, 2020), indicating a persistent emphasis on reading-oriented competencies in technology-related disciplines. The ability to read research articles and understand technical terminology further highlights the importance of receptive skills for academic success in Informatics, suggesting that ESP instruction should prioritize discipline-specific reading strategies rather than general academic texts.

Professional and Workplace English Needs

Table 2. Students' perceptions of professional and workplace-related English needs are shown in

No.	Item	Mean	SD	Rank
1	Speaking English for job interviews	3.47	0.50	1
2	Oral communication in the workplace	3.38	0.56	2
3	Delivering presentations in English	3.21	0.61	3
4	Writing professional emails and reports	2.95	0.67	4

Table 2 shows that speaking English for job interviews emerged as the highest-rated professional need ($M = 3.47$). This result supports Anthony (2018), who emphasizes the growing importance of oral communication skills in technology-driven workplaces. The prioritization of workplace communication and presentations suggests that Informatics students increasingly recognize English as a key tool for employability and professional interaction in global and digital environments. This finding implies that English instruction

for Informatics students should move beyond classroom-based communication toward workplace-oriented speaking tasks that simulate real professional interactions.

Digital-Era English Skills

Table 3 summarizes students' English needs related to digital learning environments.

No.	Item	Mean	SD	Rank
1	Understanding online tutorials and videos	3.55	0.46	1
2	Reading software documentation	3.44	0.52	2
3	Using English forums and online communities	3.29	0.58	3
4	Participating in MOOCs in English	3.02	0.65	4

As shown in Table 4, understanding online tutorials and instructional videos was perceived as the most essential digital-era English skill ($M = 3.55$). This finding reflects students' reliance on digital learning resources to develop technical competencies. Consistent with Serafini et al. (2020), the results indicate that English proficiency plays a crucial role in navigating digital texts and multimodal learning environments. This underscores the necessity of integrating authentic digital materials, such as software documentation and online tutorials, into ESP courses to reflect the realities of technology-mediated learning contexts.

Priority of English Language Skills

Table 4. Priority of English Language Skills

No.	Skill	Mean	SD	Rank
1	Reading	3.51	0.47	1
2	Speaking	3.34	0.54	2
3	Listening	3.12	0.60	3
4	Writing	2.88	0.66	4

Table 4 indicates that reading was identified as the highest-priority language skill, followed by speaking. This pattern suggests that Informatics students emphasize receptive skills for academic learning while simultaneously acknowledging the growing importance of spoken communication for professional purposes. Writing skills were perceived as less critical, possibly due to limited opportunities to produce extended academic texts in English within their study program. This pattern may indicate a transitional stage in which students begin to recognize the professional value of speaking skills alongside traditionally dominant reading competencies.

Students' Perceived Difficulties

Table 5. presents students' perceived difficulties in learning English.

No.	Item	Mean	SD	Rank
1	Limited technical vocabulary	3.48	0.49	1
2	Lack of confidence in speaking	3.39	0.53	2
3	Difficulty understanding fast spoken English	3.18	0.58	3
4	Grammar problems	2.96	0.62	4

As presented in Table 5, limited technical vocabulary emerged as the most significant challenge faced by students. This finding aligns with Nation et al. (2019), who highlight vocabulary knowledge as a key factor in successful language use in specialized domains. Low confidence in speaking further indicates the need for instructional approaches that provide greater exposure to authentic communicative practices. This finding reinforces the importance of explicit vocabulary instruction embedded within authentic Informatics-related contexts to enhance both comprehension and communicative confidence.

CONCLUSION

This study examined the English learning needs of Informatics students in the digital era using a mixed-method descriptive survey design. The findings demonstrate that English is perceived primarily as a functional tool for accessing academic knowledge, professional communication, and digital learning resources. Reading skills related to technical texts and software documentation were identified as the most essential academic needs, while speaking skills for job interviews and workplace communication were prioritized in professional contexts.

The results also indicate that students rely heavily on English in digital learning environments, such as online tutorials, instructional videos, and software documentation. However, significant challenges were reported, particularly limited technical vocabulary and low confidence in speaking English. These findings highlight the gap between students' current English proficiency and the communicative demands of academic and professional Informatics contexts.

Despite its contributions, this study is limited to a single institutional context, which may affect the generalizability of the findings. Future research may involve larger samples across multiple institutions or explore longitudinal impacts of ESP-based curriculum implementation for Informatics students in Indonesian higher education. Overall, the findings provide empirical support for redesigning English courses toward an ESP-oriented curriculum that addresses discipline-specific and digital-era demands.

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