EDUVELOP
JOURNAL OF ENGLISH EDUCATION AND DEVELOPMENT
Nationally Accredited Journal Decree No. 10/C/C3/DT.05.00/E5/2025 (Sinta 2)

Volume 9, No. 1, March 2026 • **Page: 320 - 328**
DOI: https://doi.org/v9i1.6130
ISSN 2597-713X (print)
ISSN 2597-7148 (online)

OPEN ACCESS: Research Article

English Needs Analysis for Technology Students at a Technopreneurship-Based University

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Received : 2025-12-29	**Accepted** : 2026-01-13
Revision : 2026-02-21	**Published** : 2026-03-31

Abstract

In the context of rapid digital transformation, English proficiency has become a strategic competency for students in technopreneurship-oriented information technology programs. However, discrepancies remain between students' current competence and the communicative demands of startup ecosystems. This study aims to identify the specific English language needs of technopreneurship-based IT students using Dudley-Evans and St. John's (1998) Needs Analysis framework. A descriptive mixed-method design was employed, involving 38 respondents (students, alumni, and industry practitioners). The questionnaire demonstrated strong content validity (S-CVI/Ave=0.98) and acceptable internal consistency across core dimensions. Quantitative findings indicate a substantial gap between Target Situation demands (M=9.16) and Present Situation competence (M=5.08), confirming substantial professional communication "lacks." Qualitative thematic analysis using NVivo further highlights the prioritization of productive skills, particularly digital content writing and professional complaint handling, as key industry necessities. By systematically mapping findings into the domains of necessities, lacks, and wants, this study contributes to contemporary ESP discussions in digitally mediated and entrepreneurial contexts. The study recommends a hybrid pedagogical model integrating task-based learning and communicative language teaching to enhance authentic task performance and sociolinguistic competence in technology-driven higher education.

Keywords: *English for Specific Purposes; Needs Analysis; Technopreneurship; Task-Based Learning; Communicative Language Teaching*

DOI: https://doi.org/v9i1.6130

1. Introduction

The rapid expansion of digital technologies and startup ecosystems has significantly transformed professional communication practices, particularly within Information Technology (IT) and technopreneurship-oriented environments. In this context, English proficiency functions not merely as an academic requirement but as a strategic professional competency that enables graduates to engage in global collaboration, interpret technical documentation, participate in virtual meetings, and produce digital content. Previous studies emphasize that English proficiency contributes substantially to employability and career mobility in globalized workplaces (Klimava, 2022; Nghia et al., 2024; Tushar & Sooraksa, 2023). In Indonesia, however, national data indicate that overall English proficiency remains relatively low (Education First, 2024) while industry reports suggest that many graduates demonstrate limited communicative competence despite completing higher education (Talentics, 2023).

These conditions raise an important pedagogical question: to what extent does university English instruction align with the communicative demands of digital and startup-based industries? While general English courses may provide foundational linguistic knowledge, they often lack contextual relevance to professional tasks such as product pitching, digital content writing, client negotiation, or complaint handling. In startup ecosystems, communication is increasingly digital, interactive, and multimodal, requiring not only grammatical accuracy but also rhetorical awareness, audience adaptation, and sociolinguistic sensitivity (Laadem & Mallahi, 2019). Therefore, English instruction in technopreneurship-based institutions must respond to evolving professional communication patterns.

Within the framework of English for Specific Purposes (ESP), Needs Analysis (NA) constitutes the foundation of curriculum development. Hutchinson and Waters (Hutchinson & Waters, 1987) conceptualized needs in terms of target needs and learning needs, while Dudley-Evans and St. John (Dudley-Evans & St John, 1998) refined the framework by distinguishing among necessities (objective demands of the target situation), lacks (the gap between learners' current competence and required competence), and wants (learners' subjective preferences and expectations). Although these constructs are widely cited in ESP research, they are often presented descriptively rather than operationalized analytically. Recent ESP scholarship highlights the importance of systematically mapping empirical findings into NA domains to ensure theoretical coherence and pedagogical relevance in digitally mediated contexts (Anthony, 2018; Xia, 2020).

Previous research in engineering-oriented ESP contexts has frequently emphasized reading comprehension due to the prevalence of technical documentation (Basturkmen, 2022; Pogatsnik & Kendrovics, 2020). Similarly, studies in Indonesian vocational and technical settings report discrepancies between academic English instruction and industry expectations (Natsir et al., 2022; Nurhasanah & Kurniawan, 2023; Prasetya,

DOI: https://doi.org/v9i1.6130
2021). However, most of these studies rely primarily on student perceptions and rarely triangulate findings with alumni and industry practitioners (Nguyen & Nguyen, 2017). Moreover, limited attention has been given to technopreneurship-based universities, where the integration of technology and entrepreneurship generates hybrid communicative demands that extend beyond technical literacy toward persuasive, interactive, and digitally mediated communication. This gap suggests the need for a context-specific and stakeholder-informed needs analysis in technopreneurial higher education.

In startup environments, professionals are expected to create persuasive digital content, conduct online presentations, manage cross-border stakeholder communication, and respond professionally to customer feedback. These evolving communicative practices indicate that English needs in technopreneurial contexts may differ from traditional engineering settings, where reading comprehension has historically been prioritized.

This study therefore moves beyond merely describing the Needs Analysis framework and instead operationalizes the domains of necessities, lacks, and wants as analytical categories. Quantitative data are interpreted to identify measurable lacks by comparing Present Situation competence with Target Situation demands, while qualitative findings capture articulated necessities from industry stakeholders and expressed wants from learners. By integrating these data strands within the NA framework, the study ensures conceptual alignment between theoretical constructs and empirical evidence.

The novelty of this research lies in three key aspects. First, it situates ESP needs analysis within a technopreneurship-based IT program, a context that remains underexplored in Indonesian ESP scholarship. Second, it integrates perspectives from students, alumni, and industry practitioners to enhance ecological validity and reduce reliance on single-source perception data. Third, it translates empirical findings into a tangible pedagogical application. Based on the identified necessities—particularly digital content generation and professional complaint handling—the study proposes a brief prototype module outline integrating Task-Based Learning (TBL) to ensure task authenticity and Communicative Language Teaching (CLT) to foster sociolinguistic competence within a technopreneurship ESP course.

Accordingly, this study aims to identify the specific English language needs of IT students in a technopreneurship-based university and to analyze the gap between their current competence and professional communication demands through the analytical domains of necessities, lacks, and wants. The findings are expected to provide an evidence-based foundation and a practical curricular roadmap for developing an industry-responsive ESP curriculum aligned with the communicative realities of startup ecosystems.

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2. Methods

2.1 Research Design

This study employed a descriptive mixed-methods design to conduct a comprehensive Needs Analysis (NA) within a technopreneurship-based Information Technology (IT) program. The mixed-method approach facilitated the integration of quantitative and qualitative data to enhance analytical depth and triangulation. Participants included students, alumni, and industry practitioners to strengthen ecological validity and ensure that identified needs reflect both academic and professional perspectives.

2.2 Instrument Development and Validation

The questionnaire was developed based on Dudley-Evans and St. John's (1998) Needs Analysis framework. To ensure content validity, five expert validators evaluated the instrument using the Content Validity Index (CVI) method. The Scale-level Content Validity Index (S-CVI/Ave) reached 0.98 for relevance and 0.91 for clarity, indicating strong representation of the targeted constructs.

Internal consistency reliability was assessed using Cronbach's Alpha (α) in SPSS. The overall reliability coefficient for the 14-item instrument was $\alpha = 0.611$. Reliability was also analyzed per dimension to account for the multidimensional nature of NA constructs. The Target Situation construct demonstrated good reliability ($\alpha = 0.759$), while the Lacks construct showed acceptable consistency ($\alpha = 0.698$). Given the exploratory and descriptive nature of the study and the triangulation with qualitative data, these reliability levels were deemed acceptable.

2.3 Scoring and Data Computation

The questionnaire employed a 4-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree). Items within each domain were aggregated into composite scores. For domains with three items (e.g., Target Situation), the theoretical score range was 3–12 (3×1 to 3×4). For domains with two items (e.g., Lacks and Present Situation), the theoretical range was 2–8 (2×1 to 2×4). The values presented in Table 1 represent observed composite scores derived from the responses of the N = 38 participants.

2.4 Data Analysis Procedures

Quantitative data were processed using SPSS to compute descriptive statistics, including mean (M), standard deviation (SD), frequency distribution, and percentage. A comparative analysis between Target Situation demands and Present Situation competence was conducted to identify measurable "lacks" within the NA framework.

Qualitative interview data were analyzed using thematic analysis supported by NVivo software. The coding process involved open coding followed by categorization into the domains of necessities, lacks, and wants. Coding consistency was enhanced through iterative review and peer debriefing to minimize interpretative bias and ensure alignment between identified themes and research objectives.

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3. Results and Discussion

3.1 Quantitative Mapping of the Proficiency Gap ("Lacks")

Descriptive statistical analysis reveals a notable discrepancy between Target Situation demands and Present Situation competence. As presented in Table 1, the Target Situation domain yielded a high mean score (M = 9.16, SD = 2.284), whereas Present Situation competence was considerably lower (M = 5.08, SD = 1.171). The 4.08-point difference represents the domain of "lacks" within Dudley-Evans and St. John's (1998) Needs Analysis framework, indicating that students' current communicative readiness does not fully align with professional expectations in technopreneurship-oriented environments.

This discrepancy reflects a contextual gap rather than a general linguistic deficiency. In startup ecosystems, communication functions strategically: to pitch ideas, negotiate solutions, manage clients, and promote products. The magnitude of the gap therefore suggests that existing instructional practices may not sufficiently address the complex communicative demands of digitally mediated professional contexts. Such demands increasingly require integration of language proficiency with digital competence and interactional adaptability (van Laar et al., 2017).

The minimum and maximum values in Table 1 represent empirical composite scores derived from participant responses rather than theoretical score limits. Thus, the discrepancy reflects actual response distribution among the N = 38 participants and reinforces the validity of the identified "lacks."

Table 1. Descriptive Statistics of Needs Analysis Components

Descriptive Statistics					
	N	Min.	Max.	Mean	Std. Deviation
Target Situation & Professional Communication	38	3	12	9.16	2.284
Personal Information	38	7	12	10.87	1.212
Present Situation	38	3	7	5.08	1.171
Lacks	38	2	8	5.11	1.607
Learning Needs	38	5	8	7.34	.909
Means Analysis	38	2	8	5.95	1.374
Valid N (listwise)	38				

3.2 Thematic Analysis: Articulated "Necessities" in Multimodal Communication

Qualitative findings further illuminate the nature of communicative expectations in technopreneurship environments. NVivo word frequency analysis identified high occurrences of oral-interactive terms, including *"berbicara"* (42), *"komunikasi"* (41), *"presentasi"* (24), and *"meeting"* (23). These thematic counts indicate that real-time interaction and professional speaking are central communicative practices in startup contexts.

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Table 2. NVivo Word Frequency Results (Excerpt)

Word	Count
berbicara	42
komunikasi	41
presentasi	24
meeting	23
digital	48
profesional	32

Interview data further identified digital content creation and professional complaint handling as dominant themes. Within the NA framework, these themes represent articulated "necessities," reflecting objective demands expressed by industry practitioners. In startup ecosystems characterized by flat organizational structures and rapid innovation cycles, employees are often required to combine technical expertise with persuasive and relational communication. Communication thus becomes multifunctional—simultaneously technical, promotional, and managerial.

Compared with traditional engineering-oriented ESP research that has emphasized reading technical documentation (Basturkmen, 2022; Pogatsnik & Kendrovics, 2020), the present findings suggest a contextual recalibration of communicative priorities. However, this study does not negate the importance of receptive skills. Reading remains foundational in technical startup roles such as backend development and data analysis, where professionals must interpret API documentation, technical manuals, and system specifications (Laadem & Mallahi, 2019).

Therefore, the observed urgency of productive skills reflects a multimodal rebalancing of communicative competence rather than a complete displacement of receptive abilities. This interpretation aligns with contemporary perspectives on 21st-century professional skills, which emphasize the integration of digital literacy, communication, and adaptability in workplace performance (van Laar et al., 2017).

3.3 Convergence between "Wants" and Industry "Necessities"

The Learning Needs domain yielded a relatively high mean score (M = 7.34, SD = 0.909), indicating strong student agreement regarding the importance of practice-oriented and authentic learning experiences. Students expressed preference for pitching simulations, digital branding tasks, and role-play activities involving client interaction.

These responses represent the "wants" domain within Dudley-Evans and St. John's (1998) framework. Notably, there is convergence between student-identified "wants" and industry-articulated "necessities." This convergence enhances the validity of the proposed curriculum direction, as it demonstrates coherence between learner expectations and workplace demands. Prior research has shown that alignment between instructional tasks and real-world professional practices positively influences graduate

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employability and skill transferability (Succi & Canovi, 2020).

3.4 Pedagogical Implications: Prototype TBL–CLT Module

To translate these empirical findings into instructional design, this study proposes a prototype module integrating Task-Based Learning (TBL) and Communicative Language Teaching (CLT). The model directly responds to identified "lacks," "necessities," and "wants" within the Needs Analysis framework.

TBL is particularly appropriate for tasks requiring authentic output, such as digital branding and investor pitching, as it emphasizes goal-oriented task completion. The integration of technology-mediated tasks within TBL has been shown to enhance relevance and engagement in ESP contexts (González-Lloret, 2016). CLT complements this approach by foregrounding sociolinguistic appropriateness, negotiation strategies, and interactional competence in high-stakes scenarios such as complaint management.

Table 3. Prototype Module for Technopreneurship ESP

Module Focus	NA Domain	Pedagogical Approach	Sample Task
Digital Branding & Content Creation	Necessities	TBL (Authentic Task)	Develop an SEO-optimized LinkedIn product launch post with justification of language strategy
Professional Complaint Handling	Necessities	CLT (Interactive Communication)	Role-play a Zoom meeting responding to a dissatisfied client using appropriate tone and mitigation strategies
Investor Pitching Simulation	Lacks & Wants	TBL + CLT	Deliver a 3-minute startup pitch followed by structured Q&A session

By systematically mapping Needs Analysis domains into pedagogical design, the proposed model ensures coherence between empirical findings and curriculum implementation. Rather than offering abstract instructional suggestions, this prototype demonstrates how communicative priorities in technopreneurship contexts can be operationalized into structured, industry-responsive learning experiences.

4. Conclusion

This study identifies a measurable proficiency gap (M = 5.08 vs M = 9.16) among IT students, revealing critical communicative "lacks" in technopreneurship-oriented contexts. The findings indicate a contextual shift in communicative priorities, where productive and interactional skills—particularly digital content creation and professional complaint handling—gain prominence alongside technical literacy. Theoretically, the study advances Needs Analysis by operationalizing the domains of necessities, lacks, and wants within digitally mediated professional settings. Practically, it proposes a TBL–CLT prototype module that translates empirical findings into an industry-responsive instructional model. Although methodological rigor was maintained through validation and triangulation, the relatively small sample size (N = 38) from a single institution limits

broader generalization. Future research should conduct longitudinal evaluations and comparative studies across technopreneurship programs to further refine ESP curriculum development in technology-driven higher education environments.

Acknowledgement

The authors would like to express their sincere gratitude to Primakara University for the support and facilities provided to conduct this research. Special appreciation is extended to the Directorate of Career Development and Alumni Primakara University for their assistance in providing essential graduate data. We are deeply grateful for Dr. Kadek Sintya Dewi, S.PD.,M.Pd, from Universitas Pendidikan Ganesha, I Wayan Eka Dian Rahmanu, S.Pd, M.Pd, PhD (cand) from Politeknik Negeri Bali/University of Szeged, Hungary, and Dr. Anak Agung Putri Maharani, S.Pd., M.Pd. and Dr. I Ketut Wardana, S.Pd., M.Hum., from Universitas Mahasaraswati for their constructive validation research instruments, as well as the practitioner lecturers at Primakara University for their professional insights. Finally, our heartfelt thanks go to the Primakara alumni, final year-students, and industry partners who willingly participated as respondents and contributors in this study.

Conflicts of Interest

The author declares no conflict of interest related to this research.

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