



Developing a Self-Study E-Module for English Medical Terminology: A Need Analysis of Health Science Students

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Abstract

Mastery in English medical terminology is crucial for health science students to engage with academic material, comprehend clinical information, and communicate successfully in professional settings. Many learners have ongoing challenges due to the lack of specialized, self-directed learning tools designed for their specific discipline and contextual requirements. This study performed the needs analysis phase of the ADDIE instructional design paradigm to examine the unique requirements for a self-learning e-module in English medical terminology. Data were gathered from 64 students participating in nursing, midwifery, and medical programs via a validated online questionnaire and semi-structured interviews with two faculty lecturers. The analysis investigated three dimensions: learners' needs, existing shortcomings, and favored learning modalities. The findings indicated that students necessitate terminology proficiency mainly for comprehending lectures, interpreting medical literature, and fulfilling academic tasks; encounter significant difficulties in contextual understanding, precise application, and pronunciation; and favor multimedia learning incorporating visual aids, interactive activities, and self-evaluation components. Instructors verified the absence of digital resources tailored to various disciplines that facilitate independent study. The results encourage the development of a mobile-compatible, multimedia-enhanced e-module to connect passive recognition with active application of medical terminology, promoting vocabulary proficiency and learner autonomy in English for Medical Purposes.

Keywords: Autonomous learning; English for medical purposes; English medical terminology; Needs analysis

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INTRODUCTION

The globalization of healthcare and the prevalence of English as the lingua franca in medical science have rendered proficiency in English medical terminology essential for health science students (Hutchinson & Waters, 1987; Kohnke et al., 2019). Proficiency in English medical terminology is essential for accessing academic research, analyzing clinical paperwork, and participating in international partnerships (Syakur et al., 2020). Students in nursing, midwifery, and medicine sometimes encounter difficulties with English medical terminology owing to an absence of self-directed, visually oriented learning resources specific to their fields (Hariyanto et al., 2022; Rinawati et al., 2022). Studies demonstrate that visual learning tools, such as diagrams, illustrated glossaries, and interactive e-modules, substantially improve terminology retention and understanding, especially in technical disciplines (Ratminingsih et al., 2021; Wulandari et al., 2021). Despite this data, current English medical terminology resources

in Indonesia are predominantly text-centric, overlooking students' pronounced inclination towards visual learning modalities, as evidenced in analogous ESP scenarios (Ginusti & Ariebowo, 2023; Ratminingsih et al., 2021).

In Indonesia, the necessity for English medical terminology proficiency is heightened by government policies such as *Merdeka Belajar-Kampus Merdeka* (Kemdikbud, 2020), which prioritize competency-based curriculum and global competitiveness. Nonetheless, English for Specific Purposes (ESP) training in Indonesian health sciences frequently depends on antiquated, generalist resources that do not cater to the specific lexical requirements of the discipline (Margana & Widyantoro, 2017; Syakur et al., 2020). A study indicated that 89% of nursing students did not have access to EMT resources pertinent to clinical practice (Rinawati et al., 2022), whereas midwifery academies reported that over 60% of students faced difficulties with the pronunciation and contextual application of medical terminology (Hariyanto et al., 2022). These problems reflect findings in other technical domains in Indonesia, such as aviation and tourism, where visual-glossary interventions enhanced vocabulary retention by 40% (Ginusti & Ariebowo, 2023; Prayudi et al., 2019). Despite the fast digitization of medical education worldwide (Woolliscroft, 2020), resources tailored to medical English are scarce.

Although research in English for Specific Purposes (ESP) has frequently emphasised the relevance of domain-specific vocabulary for academic and professional communication, studies on English medical terminology (EMT) in Indonesia are scarce. EMT materials, including as glossaries in nursing textbooks or vocabulary lists in ESP modules, are generally text-heavy, decontextualized, and teacher-dependent, with insufficient scaffolding for independent practice (Kayaoğlu & Akbaş, 2016). They also lack interactive features like pronunciation support, scenario-based exercises, and visual scaffolds, which have been demonstrated to improve comprehension and retention in international settings (George et al., 2014; Mayer & Fiorella, 2021; O'Doherty et al., 2018). As a result, students may recognize medical phrases but struggle to utilize them correctly in actual clinical or academic interactions. This results in a continuing gap between learners' identified demands and the development of tools that truly promote self-directed, contextualized learning. The current work bridges this gap by combining a comprehensive needs assessment with the creation of a mobile-compatible, multimedia-enhanced EMT e-module.

Building on this gap, the study aims to: (1) identify health science students' needs for EMT in both academic and clinical settings; (2) assess their deficiencies in comprehension, contextual recognition, spelling, pronunciation, and usage; and (3) investigate their learning media and activity preferences. These aspects comprise the Analysis stage of the ADDIE instructional design paradigm, which serves as the foundation for the following stages of e-module development. Data were gathered from 64 students in nursing, midwifery, and medical programs using surveys and lecturer interviews, ensuring that both learner and expert viewpoints were represented. The scope of this article is limited to the needs analysis, which serves as an empirical foundation for developing a mobile-compatible, multimedia-based EMT e-module. This tool is expected to improve learner autonomy, vocabulary knowledge, and contextual application, contributing to improved preparedness for professional practice.

RESEARCH METHOD

Research Design

This research employed a mixed-methods approach (Creswell, 2012) during the Analysis phase of the ADDIE model (Branch, 2009). The convergent parallel architecture facilitated the integration of quantitative and qualitative data, so enabling a

thorough requirements assessment for the medical terminology e-module. This phase concentrated on pinpointing deficiencies in current resources, learner inclinations, and institutional needs to guide the succeeding stages of ADDIE (Design, Development, Implementation, Evaluation).

Participants

The study involved 64 health science students (nursing, midwifery, medicine) from one Indonesian private university. Furthermore, two health sciences lecturers were intentionally selected for their expertise to be interviewed. This methodology corresponds with the suggestions for requirements analysis in English for Specific Purposes situations (Hutchinson & Waters, 1987).

Data Collection

Quantitative data were collected using a 35-item online questionnaire sent using Google Forms to 64 health science students enrolled in nursing, midwifery, and medical schools. The instrument was modified from established ESP needs analysis frameworks in medical education (Artino et al., 2014) and guided by previous research in Indonesian and international settings (Mohamed et al., 2024; Nurakhir, 2018; Rinawati et al., 2022), thereby ensuring construct validity and contextual pertinence. The questionnaire was created to encompass three interconnected characteristics of learner requirements.

The initial dimension highlighted students' perceived necessity for English medical terminology in both academic and professional settings, a concern also noted in prior research that underscores the significance of discipline-specific language in medical education (Lodhi et al., 2018; Mohamed et al., 2024). The second factor focused on the challenges experienced by students, including comprehension of meanings, identification of terms in clinical contexts, recollection of spelling and pronunciation, and application of terminology in both oral and writing communication. These deficiencies reflect established difficulties faced by medical ESP learners in many educational contexts (Alrashed & Abdel Latif, 2024; Karimnia & Khodashenas, 2018). The third dimension analysed students' preferred learning media and activities, corroborating previous research indicating that health science students favour interactive matching tasks, diagram labelling, and pronunciation practice to enhance vocabulary acquisition (Nurakhir, 2018; Sikumbang & Dalimunte, 2021).

The questionnaire included single-choice items for necessities and deficiencies, as well as multiple-choice items for desires, facilitating the collection of both ranking and extensive preference data. Open-ended questions allowed participants to elaborate on their selections, enhancing the qualitative richness of the quantitative results. This mixed-format design adheres to recognized best practices in English for Specific Purposes needs analysis (Rinawati et al., 2022) and enabled a thorough, triangulated comprehension of learners' academic and professional language requirements. The resultant dataset established a solid basis for determining instructional priorities and guided the pedagogical development of a self-study e-module, responding to the demand for learner-centered, context-specific resources in English for Medical Purposes (Mohamed et al., 2024; Nurakhir, 2018; Wahyudi et al., 2024).

The instrument underwent a stringent validation process that included peer comments and expert evaluation. Initially, peers and two faculty members from the health sciences department evaluated the instrument during classroom discussions, providing constructive feedback on content, intelligibility, and alignment with educational objectives. Subsequently, the same professors, possessing substantial expertise in ESP curriculum and material development, conducted expert validation by meticulously assessing the items and proposing enhancements. The instrument was amended in accordance with these aggregated recommendations, conforming to

established protocols in instrument validation where expert evaluation and feedback are essential for ensuring content precision and functionality. Incorporating peer review into the validation process not only improves the tool's reliability but also bolsters its credibility—an method advocated in educational research as essential for instrument improvement (Cobern & Adams, 2020).

Data Analysis

Quantitative data from the questionnaires were examined to characterize participants' skill in medical terminology and learning preferences, succeeded by exploratory factor analysis to uncover underlying trends in instructional requirements. Qualitative data from interviews and focus group discussions were subjected to thematic analysis in accordance with Braun & Clarke (2006) six-phase framework, with transcripts rigorously coded manually to discern recurring patterns in participants' experiences and expectations. Utilizing methodological triangulation, the quantitative and qualitative findings were synthesized through a convergent parallel approach (Creswell & Clark, 2018), juxtaposing statistical trends with emergent themes to ascertain consistent priorities for e-module development while elucidating divergent perspectives. This mixed-methods synthesis yielded a thorough needs assessment that guided the content structure and educational design of the proposed medical terminology e-module, maintaining coherence between learners' identified needs and the instructional approach.

RESULTS AND DISCUSSION

Students' Necessities

This study examined health science students' views on the importance of acquiring English medical terminology. The data were collected via a structured questionnaire that examined students' perceived significance and particular scenarios in which medical English is required.

Table 1. Students' Needs Analysis of the Necessity of Medical Terms/Specialized Vocabulary

Item/ Context	Response Category/ Situation	Percentage
Level of importance of English and medical terminology	Very Important	70.3%
	Important	28.1%
	Less Important	1.6%
	Not important at all	0.0%
Situations in which English medical terms are needed	Reading English medical journals or articles	51.6%
	Communicating with foreign patients or health professionals	28.1%
	Writing medical reports	14.1%
	Others	6.3%

Table 1 indicates that the majority of respondents (70.3%) considered English medical terminology to be very important for their academic and professional advancement, whilst 28.1% regarded it as important. Only one student (1.6%) considered it as less significant, and none asserted that it was unimportant. In terms of usage, over half of the respondents (51.6%) indicated that they predominantly require English for reading English-language medical publications or articles. Furthermore, 28.1% reported that their principal setting for utilizing English involved communication with foreign patients or international health professionals. 14.1% of the students opted for writing medical reports, and the remaining 6.3% selected "other" scenarios.

The Faculty of Health Sciences teachers concurred with the students' views on the need of understanding English medical terminology. They underscored its significance in both academic endeavors and clinical as well as professional settings:

“A lot of the materials we rely on in class, particularly the usual medical textbooks and journal articles, are in English. It’s not just about translating words, but really understanding the meaning of the terms in context. That’s where many of our students struggle.” (S, 36 year-old-woman, nursing department lecturer)

“During clinical practice, students are often exposed to English, whether on equipment screens, in medical records, or in medication instructions. They need to be familiar with medical English to function effectively in real healthcare settings, especially if they plan to work in internationally accredited hospitals.” (D, 35-year-old woman, medical department lecturer)

These findings underscore that students regard EMT as crucial not just for academic objectives (especially for accessing medical literature) but also for professional preparedness in worldwide healthcare environments. This aligns with prior ESP research emphasizing the significance of domain-specific vocabulary for professional proficiency (Chan et al., 2022; Zaidi & Al Jadaan, 2022). This also corroborates Salager-Meyer (2014) observation that English dominates global medical knowledge generation and dissemination, underscoring the imperative of mastering EMT for both immediate education and sustained professional advancement.

The study highlights that students' foremost requirement is the ability to read and comprehend medical literature, with significant secondary needs in clinical communication, hence emphasizing the necessity for the creation of specialized learning resources. The current EMT tools in Indonesia are predominantly text-based and decontextualized (Nurakhir, 2018; Rinawati et al., 2022), inadequately addressing the interactive, practice-oriented learning preferences observed in this study. The suggested self-study e-module aims to bridge this gap by providing contextually rich, multimedia activities that promote individual learning and genuine application.

Students' Lacks

The findings indicate that while students exhibit a general knowledge of the significance of English medical terminology, they nevertheless have difficulties in mastering and efficiently utilizing the language. These challenges are more pronounced when trainees confront technical or discipline-specific terminology in authentic or simulated clinical scenarios.

Table 2. Students' Perceived Difficulties in Learning English Medical Terminology (N = 64)

Area of Difficulty	Percentage
Identifying medical terms from clinical contexts	27.5%
Understanding the meaning of medical terms	26.0%
Remembering spelling and pronunciation	25.2%
Using the terms in complete sentences	19.8%
Others	1.5%

Table 2 indicates that the predominant challenge mentioned was the identification of medical terminology within clinical contexts, selected by 28.1% of participants. This was succeeded by comprehending the definitions of the terms (26.6%) and recalling the spelling and pronunciation (25.0%). A minority of participants (20.3%) reported that their principal challenge was the use of medical terminology in whole sentences, whereas no student identified "others" as a significant issue. The results suggest that the students' difficulties extend beyond word memory to include the use of terminology in both academic and clinical contexts.

The findings are echoed by insights obtained from lecturers at the Faculty of Health Sciences, who observed similar patterns.

"From what I've seen, students frequently find it challenging to understand the meaning of English medical terms, particularly when they come up in clinical case scenarios." They often struggle to recognize those terms when they appear up in real situations, such as patient histories or lab results." (S, 36 year-old-woman, nursing department lecturer)

"I've noticed that during simulations or case discussions, students tend to pause or hesitate when they're trying to remember or use the English terms they've learned." They get the overall concept, but using the vocabulary in a clinical setting is still a challenge for a lot of them." (D, 35-year-old woman, medical department lecturer)

These insights underscore a critical difficulty in English for Medical Purposes: the gap between passive recognition and active application. Medical terminology is structurally intricate, characterized by polysemy, prevalent abbreviations, and a swiftly changing lexicon (Džuganová, 2019). In genuine clinical settings, this complexity is intensified for learners, as precision is essential for patient safety. Misinterpretation or reluctance in employing terminology can undermine effective communication, reflecting findings in extensive healthcare communication research that emphasize how language barriers lead to errors and disparities in care, including miscommunication and diagnostic errors, reduced access and delayed care, lowered quality and satisfaction, as well as structural and systemic inequities (Al-Yateem et al., 2023; Al Shamsi et al., 2020; Pandey et al., 2021; Taylor & Kazembe, 2024)

The gap between passive recognition and active use of English medical terminology is a significant challenge in English for Specific Purposes, particularly in the medical field. From a pedagogical perspective, this challenge corresponds with psycholinguistic evidence indicating that receptive vocabulary knowledge does not inherently lead to constructive application (Roche & Harrington, 2013). Learners must acquire not only definitions but also contextualized, functional knowledge that allows them to retrieve and utilize terms fluently in real-time communication (de la Fuente, 2006). Therefore, instruction in medical English should emphasize contextual usage, pronunciation demonstration, and sentence-level exercises over isolated memorization.

Medical language is not solely technical but also socially and culturally embedded, influenced by the communicative practices of healthcare teams and the institutional structures within which they function. Proficiency thus encompasses more than familiarity with technical terminology; it involves comprehending the subtleties of interprofessional communication, which frequently includes shared meanings, euphemisms, and abbreviations. As Hull (2016) contends, medical language proficiency includes the capacity to interpret nuanced meanings within team communication, rendering it vital for ensuring patient safety and fostering effective collaboration. Misunderstandings within teams may result in disengagement or even negative clinical outcomes, highlighting that the risks associated with language extend beyond provider-patient interactions to also influence interprofessional relationships. This corresponds with Dvořáčková (2024) findings that ESP training should integrate the communicative genres employed in clinical practice to effectively prepare students for real-world medical interactions.

Students' Wants

The final part of the needs analysis concentrated on students' preferences on learning media and activities they consider most useful for comprehending English medical terminology. This information is essential for directing the creation of instructional resources that correspond with learners' expectations and facilitate independent, contextual, and engaging learning.

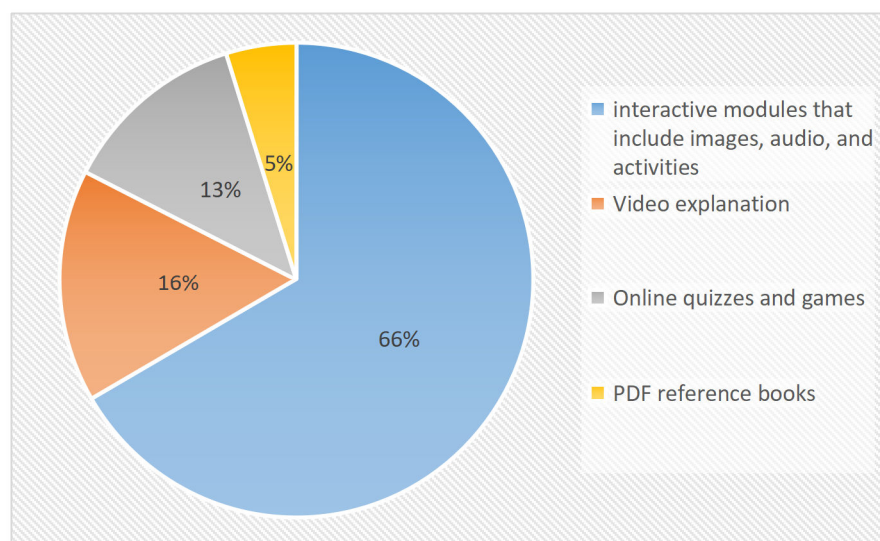


Figure 1 Students' Preferred Learning Media for English Medical Terminology

Figure 1 illustrates that a significant majority of respondents (66.7%) favored interactive modules that include graphics, audio, and practical exercises. This indicates a distinct preference for digital content that facilitates multimodal and self-directed learning. Alternative media options, including video explanations (15.9%) and online quizzes or games (12.7%), were also preferred, though to a lower degree. A minor fraction of students favored PDF-based reference materials (4.8%), suggesting that conventional static content and peer-led approaches are perceived as less efficacious.

In terms of preferred learning activities, students were allowed to select more than one response. Table 3 indicates that the most commonly selected activity was matching terms with definitions or visuals (53.1%), followed by listening to pronunciation (51.6%) and seeing labeled diagrams or anatomical representations (50%). The results underscore pupils' pronounced inclination towards visual and aural reinforcement in language acquisition. Moreover, 40.6% of students opted for interactive testing or quiz-based practice, and 26.6% indicated that composing brief medical reports reinforced their comprehension of language.

Table 3. Students' Preferred Activities for Learning English Medical Terminology

Preferred Activity	Percentage
Matching terms with definitions or images	53.1%
Listening to pronunciation of medical terms	51.6%
Viewing diagrams or labeled body images	50%
Interactive quizzes or tests	40.6%
Writing simple medical reports	26.6%

This inclination towards practical, contextual, and feedback-oriented learning corresponds with modern methodologies in language acquisition, which prioritize learner autonomy, multimodal input, and active task participation (Rao, 2019; Rahmawati & Harjanto, 2022). Additional qualitative corroboration for these findings was obtained through interviews with faculty members. A lecturer emphasized the substantial rise in student involvement through the implementation of interactive learning elements.

“Based on my experience in class, a lot of our students really benefit from more than just reading—they tend to engage better when there are visuals and hands-on activities included.” When they get to engage with concepts using diagrams, audio, or quizzes, they remember the vocabulary for a longer time and use it more confidently.” (S, 36 year-old-woman, nursing department lecturer)

“Modules that combine listening and visual exercises really help connect the dots between understanding a term and actually using it in conversation.” Students feel more confident when they hear, see, and use the terms all at once. (D, 35-year-old woman, medical department lecturer)

Students exhibit an obvious preference for interactive multimedia learning tools, including modules that integrate visuals, audio, and matching exercises. This preference is substantiated by Mayer’s Cognitive Theory of Multimedia Learning, which asserts that learning is optimised when information is conveyed through both visual and auditory modalities, thereby enhancing cognitive processing efficiency (Mayer, 2024). This corresponds with the dual-coding theory, which posits that associating words with relevant imagery enhances memory retention and comprehension by activating various cognitive pathways. (Aryanto, 2021).

Empirical research in educational technology substantiates the superiority of multimedia modules compared to traditional textbooks in facilitating knowledge acquisition (Mayer et al., 2014; Putry et al., 2018). The current study extends findings previously focused on STEM education to the setting of English for Specific Purposes (ESP) in the medical field, offering new empirical evidence for multimedia-based ESP learning tools.

CONCLUSION

This study systematically analyzed the requirements, deficiencies, and desires of health science students regarding English medical terminology through a mixed-method needs assessment involving 64 participants and interviews with faculty members. The analysis indicated that although students acknowledge the essential role of medical terminology in academic reading, clinical documentation, and professional communication, they encounter considerable difficulties in comprehending meanings, recognizing terms in genuine clinical contexts, and utilizing them in oral and written assignments. Students exhibited a distinct preference for multimedia, interactive learning experiences that include visual, aural, and contextualized practice.

These insights underscore the necessity of creating a self-study e-module designed to meet the particular linguistic and professional requirements of health sciences. The results enhance the field of English for Medical Purposes (EMP) research by providing a comprehensive learner-centered profile to inform focused material production. The study emphasizes the significance of needs analysis as a basis for evidence-based ESP curriculum development, ensuring that resources correspond with student expectations and discipline-specific demands.

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REFERENCES

- Al-Yateem, N., Hijazi, H., Saifan, A. R., Ahmad, A., Masa’Deh, R., Alrimawi, I., Rahman, S. A., Subu, M. A., & Ahmed, F. R. (2023). Quality and safety issue: Language barriers in healthcare, a qualitative study of non-Arab healthcare practitioners caring for Arabic patients in the UAE. *BMJ Open*, 13(12). <https://doi.org/10.1136/bmjopen-2023-076326>
- Al Shamsi, H., Almutairi, A. G., Al Mashrafi, S., & Al Kalbani, T. (2020). Implications

- of language barriers for healthcare: A systematic review. *Oman Medical Journal*, 35(2), 1–7. <https://doi.org/10.5001/OMJ.2020.40>
- Alrashed, M., & Abdel Latif, M. M. M. (2024). Investigating Saudi university medical students' English language difficulties: a needs analysis study. *Frontiers in Medicine*, 11(January), 1–9. <https://doi.org/10.3389/fmed.2024.1492031>
- Artino, A. R., La Rochelle, J. S., Dezee, K. J., & Gehlbach, H. (2014). Developing questionnaires for educational research: AMEE Guide No. 87. *Medical Teacher*, 36(6), 463–474. <https://doi.org/10.3109/0142159X.2014.889814>
- Aryanto, C. B. (2021). Do you remember the words? dual-coding method on long-term memory. *Jurnal Psikologi*, 19(4), 314–322. <https://doi.org/10.14710/jp.19.4.314-322>
- Branch, R. M. (2009). *Instructional design: The ADDIE approach* (Vol. 722). Springer Science & Business Media.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
- Chan, S. M. H., Mamat, N. H., & Nadarajah, V. D. (2022). Mind your language: the importance of english language skills in an International Medical Programme (IMP). *BMC Medical Education*, 22(1), 1–7. <https://doi.org/10.1186/s12909-022-03481-w>
- Cobern, W. W., & Adams, B. A. J. (2020). Establishing survey validity: A practical guide. *International Journal of Assessment Tools in Education*, 7(3), 404–419. <https://doi.org/10.21449/ijate.781366>
- Creswell, J. . (2012). *Educational research: planning, conducting and evaluating quantitative and qualitative research* (4th ed.). Pearson.
- Creswell, J. W., & Clark, V. L. P. (2018). *Designing and conducting mixed methods research*. SAGE Publications.
- de la Fuente, M. J. (2006). Classroom L2 vocabulary acquisition: investigating the role of pedagogical tasks and form-focused instruction. *Language Teaching Research*, 10(3), 263–295. <https://doi.org/https://doi.org/10.1191/1362168806lr196oa>
- Dvořáčková, V. (2024). A genre-based approach in ESP classes to teaching clinical communication focusing on breaking bad news to patients. *Discourse and Interaction*, 17(1), 30–50. <https://doi.org/10.5817/DI2024-1-30>
- Džuganová, B. (2019). Medical language – A unique linguistic phenomenon. *Jahr*, 10(1), 129–145. <https://doi.org/10.21860/J.10.1.7>
- George, P. P., Papachristou, N., Belisario, J. M., Wang, W., Wark, P. A., Cotic, Z., Rasmussen, K., Sluiter, R., Riboli-Sasco, E., Car, L. T., Musulanov, E. M., Molina, J. A., Heng, B. H., Zhang, Y., Wheeler, E. L., Shorbaji, N. Al, Majeed, A., & Car, J. (2014). Online eLearning for undergraduates in health professions: A systematic review of the impact on knowledge, skills, attitudes and satisfaction. *Journal of Global Health*, 4(1). <https://doi.org/10.7189/jogh.04.010406>
- Ginusti, G. N., & Ariebowo, T. (2023). Developing an Air Travel Picture Dictionary in Enhancing Vocabulary Mastery Among Air Transport Management Students: A Need Analysis. *VELES (Voices of English Language Education Society)*, 7(3), 572–586. <https://doi.org/10.29408/veles.v7i3.24039>
- Hariyanto, H., Joyoatmojo, S., Nurkamto, J., & Gunarhadi, G. (2022). Needs Analysis of English for Midwifery Purposes At Midwifery Academy of Harapan Mulya Ponorogo. *IJIET (International Journal of Indonesian Education and Teaching)*, 6(1), 49–60. <https://doi.org/10.24071/ijiet.v6i1.1841>
- Hull, M. (2016). Medical language proficiency: A discussion of interprofessional language competencies and potential for patient risk. *International Journal of Nursing Studies*, 54, 158–172. <https://doi.org/10.1016/j.ijnurstu.2015.02.015>
- Hutchinson, T., & Waters, A. (1987). *English for specific purposes: A learning-centered*

- approach. Cambridge University Press.
- Karimnia, A., & Khodashenas, M. R. (2018). Medical students' English language learning: Needs and perception. *Sustainable Multilingualism*, 164–190. <https://doi.org/https://doi.org/10.2478/sm-2018-0016>
- Kayaoğlu, M. N., & Akbaş, R. D. (2016). An investigation into medical students' english language needs. *Participatory Educational Research*, *spi*16(1), 63–71. <https://doi.org/10.17275/per.16.spi.1.8>
- Kohnke, L., Zhang, R., & Zou, D. (2019). Using mobile vocabulary learning apps as aids to knowledge retention: Business vocabulary acquisition. *Journal of Asia TEFL*, *16*(2), 683–690. <https://doi.org/10.18823/asiatefl.2019.16.2.16.683>
- Lodhi, M. A., Shamim, M., Robab, M., Shahzad, S., & Ashraf, A. (2018). English for Doctors: An ESP Approach to Needs Analysis and Course Design For Medical Students. *International Journal of English Linguistics*, *8*(5), 205. <https://doi.org/10.5539/ijel.v8n5p205>
- Margana, & Widyantoro, A. (2017). Developing english textbooks oriented to higher order thinking skills for students of vocational high schools in yogyakarta. *Journal of Language Teaching and Research*, *8*(1), 26–38. <https://doi.org/10.17507/jltr.0801.04>
- Mayer, R. E. (2024). The Past, Present, and Future of the Cognitive Theory of Multimedia Learning. *Educational Psychology Review*, *36*(1), 1–25. <https://doi.org/10.1007/s10648-023-09842-1>
- Mayer, R. E., & Fiorella, L. (2021). *The Cambridge Handbook of Multimedia Learning*. Cambridge University Press. <https://doi.org/https://doi.org/10.1017/9781108894333>
- Mayer, R. E., Lee, H., & Peebles, A. (2014). Multimedia learning in a second language: A cognitive load perspective. *Applied Cognitive Psychology*, *28*(5), 653–660. <https://doi.org/10.1002/acp.3050>
- Mohamed, O. I., Aljadaan, O., & Al-Ani, N. N. (2024). Needs analysis of english for specific purposes for health sciences students: a cross-sectional study at a university in the U.A.E. *Journal of Language Teaching and Research*, *15*(5), 1419–1431. <https://doi.org/10.17507/jltr.1505.04>
- Nurakhir, A. (2018). Exploring ESP needs of undergraduate nursing students in a university in Indonesia. *Advances in Social Sciences Research Journal*, *5*(7), 77–85. <https://doi.org/10.14738/assrj.57.4276>
- O'Doherty, D., Dromey, M., Loughed, J., Hannigan, A., Last, J., & McGrath, D. (2018). Barriers and solutions to online learning in medical education – an integrative review. *BMC Medical Education*, *18*(130). <https://doi.org/https://doi.org/10.1186/s12909-018-1240-0>
- Pandey, M., Maina, R. G., Amoyaw, J., Li, Y., Kamrul, R., Michaels, C. R., & Maroof, R. (2021). Impacts of English language proficiency on healthcare access, use, and outcomes among immigrants: a qualitative study. *BMC Health Services Research*, *21*(1), 1–13. <https://doi.org/10.1186/s12913-021-06750-4>
- Prayudi, M. A., Sujana, E., Dewi, N. W. Y., & Wiguna, I. G. N. H. (2019). *The Research and Development Study of Tourism Accounting Dictionary*. *103*(Teams 19), 142–148. <https://doi.org/10.2991/teams-19.2019.23>
- Putry, A. A., Warsono, Supahar, & Jumadi. (2018). Students and teachers' necessity toward multimedia learning modules (MLMs) based on benthik local wisdom to provide students' physics initial knowledge. *Journal of Physics: Conference Series*, *1097*(1). <https://doi.org/10.1088/1742-6596/1097/1/012014>
- Ratminingsih, N. M., Agustini, K., Budasi, I. G., Ana, I. K. T. A., & Dewi, I. A. R. (2021). Printed and Digital Dictionary for Multilingual Literacy Development: A Needs Analysis. *Proceedings of the 2nd International Conference on Education, Language,*

- Literature, and Arts (ICELLA 2021), 587(Icella).*
<https://doi.org/10.2991/assehr.k.211021.018>
- Rinawati, R., Trisnadi, S., & Murwantono, D. (2022). Needs Analysis of English for Medical Purposes: A Student Perspective. *Language Circle: Journal of Language and Literature*, 16(2), 348–356. <https://doi.org/10.15294/lc.v16i2.35445>
- Roche, T., & Harrington, M. (2013). Recognition vocabulary knowledge as a predictor of academic performance in an English as a foreign language setting. *Language Testing in Asia*, 1–13.
- Salager-Meyer, F. (2014). Origin and development of English for Medical Purposes. Part I: Research on written medical discourse. *Medical Writing*, 23(1), 49–51. <https://doi.org/10.1179/2047480613z.0000000000187>
- Sikumbang, S. R., & Dalimunte, A. A. (2021). Medical Students' Perceptions and Target Needs in English for Specific Purposes Courses. *Language Literacy: Journal of Linguistics, Literature, and Language Teaching*, 5(2), 553–559. <https://doi.org/10.30743/ll.v5i2.4511>
- Syakur, A., Zainuddin, H. ., & Hasan, M. A. (2020). Needs Analysis English For Specific Purposes (ESP) For Vocational Pharmacy Students. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, 3(2), 724–733. <https://doi.org/10.33258/birle.v3i2.901>
- Taylor, A., & Kazembe, P. (2024). Assessing language barriers in health facilities in Malawi. *BMC Health Services Research*, 24(1). <https://doi.org/10.1186/s12913-024-11901-4>
- Wahyudi, A., Pamuji, A., Martuti, R., & Hapradespa, A. (2024). A Need Analysis of ESP For Nursing Science Students at Stik Bina Husada Palembang. *International Journal of English and Applied Linguistics (IJEAL)*, 4(3), 326–333. <https://doi.org/10.47709/ijeal.v4i3.4945>
- Woolliscroft, J. O. (2020). Innovation in response to the COVID-19 pandemic crisis. *Academic Medicine*, 95(8), 1140–1142. <https://doi.org/10.1097/ACM.00000000000003402>
- Wulandari, P. R., Ratminingsih, N. M., & Budasi, I. G. (2021). Multilingual thematic picture dictionary: Assisting young learners' literacy. *International Journal of Language and Literature*, 5(1), 20–30. <https://doi.org/10.23887/ijll.v5i1.27694>
- Zaidi, H., & Al Jadaan, O. (2022). Students' linguistic skills and problems in learning medical vocabulary at a health sciences university in the UAE. *European Journal of Education Studies*, 9(6), 90–104. <https://doi.org/10.46827/ejes.v9i6.4330>