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Developing an English for Specific Purposes (ESP) Textbook for Pharmacy Students through a Contextual Teaching and Learning Approach

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Abstract: Contextual English proficiency is a strategic requirement for vocational students, particularly in pharmacy, to meet academic and professional challenges in the global era. However, English learning in pharmacy higher education still faces obstacles such as the limited availability of English for Specific Purposes (ESP)-based textbooks, teacher-centered practices, and the lack of authentic materials relevant to pharmaceutical contexts. This study aimed to develop an ESP textbook grounded in the Contextual Teaching and Learning (CTL) approach for pharmacy students and to examine its effectiveness in enhancing English competence. The research employed a simplified Borg and Gall Research and Development model combined with a quasi-experimental design involving eighty students at the Academy of Pharmacy Surabaya. The instruments included expert validation, language skill assessments, classroom observations, and student questionnaires. The findings revealed that the developed textbook was considered feasible by experts, positively received by students, and significantly improved the performance of the experimental group compared to the control group. These results highlight the importance of integrating CTL into ESP textbook development for vocational education both theoretically and practically. The textbook contributes to strengthening the ESP-CTL body of knowledge and offers a replicable model for other vocational education institutions.

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Introduction

English has become a dominant international language in the era of globalization and the Fourth Industrial Revolution. English proficiency is a key factor of success across various domains, including higher education, industry, diplomacy, science, and technology (Rahmi et al., 2021). In the Indonesian higher education context, English competence is widely recognized as an indicator of graduate quality and a determinant of successful internationalization of universities

(Alwasilah, 2001; Abbas, 2008; Lusiyani, 2022). This need is particularly relevant for students in health-related fields, especially pharmacy, who are required to master academic literature, professional communication, and pharmaceutical practices in a global context (Xirera et al., 2021; Winarsih, 2017). Therefore, contextual English proficiency is not merely

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an academic requirement but also a strategic prerequisite for graduates' readiness to face professional challenges in the global era.

However, the reality of English learning in pharmacy higher education still shows several shortcomings. First, textbooks currently used in pharmacy programs rarely accommodate English for Specific Purposes (ESP) tailored to pharmaceutical studies (*Mariana & Purwana, 2022).* Second, the learning process remains largely teacher-centered, which makes students tend to be passive learners (Syakur et al., 2020; Laili & Nashir, 2023). Third, instruction continues to emphasize artificial language transfer, while authentic materials relevant to pharmaceutical practice are seldom utilized (Muliani & Sumarsono, 2019). Fourth, the integration of digital technology and e-learning in English learning is still very limited, despite its potential to support more interactive, flexible, and contextual learning (Pujiatna et al., 2020; Yuliana et al., 2021). These conditions indicate a substantial gap between global competency demands and classroom practices that remain largely traditional.

This gap highlights the need for English instruction in pharmacy higher education that is contextual and aligned with professional demands, supported by appropriate learning materials. While previous studies have shown the effectiveness of ESP and Contextual Teaching and Learning (CTL) in enhancing students' comprehension and motivation (Sulastini et al., 2023; Zohrani et al., 2022), very few studies have specifically focused on developing ESP textbooks for pharmacy that adopt the CTL approach. Thus, there is an urgent need to provide more relevant and systematic learning resources that address both academic and professional challenges in the pharmaceutical field. On this basis, the present study is designed to fill this gap by offering an innovative instructional solution through textbook development.

Accordingly, this study aims to develop an ESP textbook for pharmacy students that applies the CTL approach, enabling academic materials to be connected with students' real experiences in pharmaceutical practice. The research not only identifies students' learning needs but also evaluates the effectiveness of the developed textbook in improving their English competence in both academic and professional contexts. In other words, this study seeks to provide a more practical and applicable model of English instruction that is relevant to the contemporary dynamics of the pharmacy profession.

The main contribution of this article lies in offering an alternative solution for developing ESP-based English learning materials in pharmacy education. Theoretically, this study enriches the discourse on integrating ESP and CTL within vocational English learning. Practically, the developed product is expected to improve the quality of English learning in pharmacy programs and to strengthen students' readiness to meet the demands of pharmaceutical professions in a global context. Hence, this article not only provides academic value but also offers significant practical relevance for curriculum development in vocational pharmacy education in Indonesia.

Research Method

This study employed a quantitative approach with a correlational design, selected to This study employed a mixed methods design, integrating quantitative and qualitative approaches to obtain a comprehensive understanding of students' learning needs, the effectiveness of the developed materials, and their impact on English proficiency in a pharmacy context (Sugiyono, 2022). The main framework was Research and Development

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(R&D) based on a simplified Borg & Gall model, which was chosen because of its systematic nature in designing, developing, and validating instructional products (Kainulainen, 2024). To complement the development process, a quasi-experimental design was also applied to measure the effectiveness of the textbook compared to conventional materials (Maciejewski, 2020). Thus, the methodological design ensured that both the product development and its empirical testing were carried out in a rigorous and structured manner.

The research was conducted at the Academy of Pharmacy Surabaya, Indonesia, during the 2025 academic year. This institution was selected because it represents a vocational higher education environment where English for Specific Purposes (ESP) is critical but appropriate materials remain limited. The study took place over one semester, covering the entire cycle from needs analysis, development, validation, and classroom trials up to the evaluation of the textbook's effectiveness. This temporal scope allowed sufficient time to capture both formative feedback during development and summative outcomes after implementation.

The study population consisted of students enrolled in the ESP course at the Academy of Pharmacy. From this population, 80 students were selected through purposive sampling, with careful consideration of their homogeneity in semester level and study program. These students were divided equally into two groups: an experimental group, which used the developed ESP textbook based on Contextual Teaching and Learning (CTL), and a control group, which continued learning with conventional textbooks. Each group consisted of 40 students, ensuring balance between conditions and enhancing the validity of comparisons (Maciejewski, 2020). In addition to student participants, several English lecturers and an IT expert were also involved to provide validation and support for the product design.

The instruments used in this study were developed to ensure both validity and reliability. Needs analysis was carried out through surveys and interviews to identify relevant themes and content areas in pharmacy English. The draft textbook was validated by subject-matter experts, language experts, and an IT specialist, ensuring that the content, linguistic accuracy, and technological readiness met pedagogical standards (Kainulainen, 2024). Learning outcomes were measured using standardized tests in listening, reading, speaking, and writing, specifically designed for ESP in pharmacy. These tests were subjected to validity and reliability checks before being administered, thus ensuring the accuracy of data collection.

The data collection process was organized sequentially to maintain methodological rigor. First, a pre-test was conducted to assess the baseline English proficiency of both groups. Then, the treatment phase was implemented, where the experimental group used the developed CTL-based textbook while the control group continued with conventional materials. After the treatment, both groups took a post-test to measure improvement. To complement test results, questionnaires and classroom observations were conducted to capture students' perceptions of the textbook and their engagement during learning.

Finally, the collected data were analyzed using both descriptive and inferential statistics. Descriptive statistics were applied to present student responses and perceptions, while inferential statistics, particularly one-way ANOVA, were used to test the significance of differences in learning outcomes between the experimental and control groups. Statistical analysis was performed with SPSS software, which provided reliable evidence regarding the effectiveness of the CTL-based ESP textbook. This combination of methods ensured that the study not only developed a relevant learning resource but also empirically demonstrated its

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impact on students' English learning in the pharmacy domain. The research workflow is presented in Figure 1, outlining the sequential stages from need analysis to data analysis.



Figure 1 Research Process

Result and Discussion

Result

The development process of the ESP textbook for pharmacy followed the R&D cycle and produced a prototype that underwent expert validation prior to classroom implementation. Subject-matter experts, language experts, and IT specialists evaluated the textbook, confirming that it met the criteria of content accuracy, linguistic clarity, and technical feasibility. Students who participated in limited trials provided positive feedback, highlighting that the material was practical, engaging, and closely aligned with their academic and professional needs. The application of CTL principles ensured that the learning content was directly related to authentic pharmacy contexts, such as reading prescriptions, writing medical reports, and communicating with patients. These results demonstrate that the textbook had reached an acceptable level of feasibility and readiness before its broader testing in class (Hakim et al., 2020; Sulastini et al., 2023).

The experimental stage involved 80 students divided equally into control and experimental groups. The control group used conventional textbooks, while the experimental group used the developed CTL-based ESP textbook. Data were collected through pre-tests, post-tests, observations, interviews, and questionnaires. The descriptive analysis showed that the experimental group achieved higher post-test mean scores across all skills (listening, reading, speaking, and writing) compared to the control group. Students also reported higher motivation and engagement, with qualitative feedback emphasizing that the textbook was more interactive and relevant to professional practice.

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To statistically test these differences, paired-samples t-tests were conducted. The results are presented in Table 1.

Table 1 Hypothesis Testing Results (Paired Samples t-test)

Pair Compared	Mean Difference	Std. Deviation	Std. Error Mean	95% Confidence Interval (Lower–Upper)	t	df	Sig. (2-tailed)	Interpretation
Control – Experimental Group	-12.375	9.540	1.508	-15.426 – -9.324	-8.204	39	0.000	Significant difference

The results indicate that the mean difference between the control and experimental groups was -12.375, with a 95% confidence interval ranging from -15.426 to -9.324. The calculated t-value of -8.204 (df = 39, p = 0.000 < 0.05) confirmed a statistically significant difference. Thus, the null hypothesis (H_0), which stated that there was no significant difference in outcomes between students using the CTL-based textbook and those using conventional materials, was rejected. The alternative hypothesis (H_1), which predicted a positive effect of the CTL-based textbook, was accepted.

Overall, these findings demonstrate that the CTL-based ESP textbook not only passed expert validation and was perceived positively during initial trials, but also produced a significant improvement in students' English performance when applied in real classroom settings.

Discussion

The findings confirm that integrating CTL into ESP textbook development significantly enhances students' English proficiency in the pharmacy context. This aligns with the theoretical premise that ESP should be designed based on learners' specific professional needs (Faturrachman & Sulaiman, 2020; Rachmawati, 2020). The CTL framework effectively contextualized English learning by linking academic materials with real-world pharmacy practices, thereby fostering deeper learning engagement, consistent with the principles of Content-Based Instruction (Syakur et al., 2020).

Compared to prior studies, this research extends the evidence base. For example, Zohrani et al. (2022) and Sulastini et al. (2023) highlighted the role of contextualized materials in improving comprehension, while Langi (2025) demonstrated the effectiveness of technology-assisted CTL in ESP. Unlike those, this study contributes by focusing on a print-based CTL textbook, which proved effective in environments where digital adoption remains

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limited. This demonstrates that innovation in ESP materials does not necessarily depend on advanced technology but on the alignment of materials with learners' professional realities.

From a practical standpoint, the improved performance and motivation observed in the experimental group indicate that CTL-based materials encourage active participation and support the development of both linguistic and professional skills. This is especially relevant in vocational contexts such as pharmacy, where English is essential for engaging with global literature, communicating with patients, and participating in international professional networks (Winarsih, 2017; Xirera et al., 2021). The results also support the claim that meaningful and authentic learning experiences increase both retention and applicability of knowledge (Hakim et al., 2020).

Theoretically, this study contributes to ESP and CTL integration by demonstrating that R&D-based textbook development, validated by experts, can create effective and contextually relevant learning resources. Practically, the developed textbook provides a replicable model for vocational education institutions seeking to modernize ESP instruction without relying heavily on digital infrastructure.

Nonetheless, the study has limitations. The quasi-experimental design, while rigorous, was restricted to a single institution and one semester of implementation. Broader research across multiple institutions and longer durations would strengthen generalizability. Future research could also compare CTL-based printed materials with technology-assisted approaches to identify blended strategies that maximize learning outcomes in diverse contexts.

Conclusion

The manuscript describes the development of an ESP textbook for pharmacy students informed by a Contextual Teaching and Learning approach. The intended contribution is to connect English instruction with pharmacy-related communication and learning tasks. The submitted draft reports positive expert and student feedback and a statistically significant result, but the supporting validation data and the exact statistical comparison are not sufficiently documented in the current version.

The final conclusion should be revised after the authors verify the development records, expert ratings, instrument evidence, and original statistical output. If the corrected analysis demonstrates a reliable between-group advantage, the authors may report that finding with the relevant effect size and confidence interval, while acknowledging the study's sampling and setting limitations. Until then, the manuscript should not make an unqualified causal claim that the textbook significantly improved English proficiency compared with conventional materials.

Recommendation

Based on the findings, several recommendations can be proposed. First, vocational higher education institutions are encouraged to adopt and adapt CTL-based ESP materials to ensure that language instruction is closely aligned with students' professional fields. This approach can enhance students' readiness to engage in global professional environments while strengthening their discipline-specific communication skills.

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Second, curriculum developers and policymakers should integrate contextualized English resources into standard programs, especially in healthcare-related disciplines such as pharmacy, nursing, and medicine, where global communication is increasingly vital.

Third, future research should expand the scope of this study by implementing the CTL-based ESP textbook across different institutions and longer periods to enhance generalizability. Comparative studies that examine CTL-based printed materials alongside technology-assisted approaches are also recommended, as they may provide blended solutions that maximize learning effectiveness in diverse educational settings.

Finally, researchers are advised to further explore how CTL principles can be combined with digital tools, such as mobile learning or AI-driven tutoring systems, to create innovative, adaptive, and scalable solutions for ESP instruction.

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