



Designing English Handbook for the Department of Architectural Engineering and Building Information at Vocational High School

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Abstract

This research aimed to design an English handbook specifically for students of the Department of Architectural Engineering and Building Information. The study was conducted to address the lack of appropriate English learning materials that focus on technical vocabulary and communication skills relevant to the students' field of study. The research employed a Research and Development (R&D) approach using the 4D model, which consists of Define, Design, Develop, and Disseminate stages. Data were collected through needs analysis, expert validation, and student responses. The final product was an English handbook containing technical vocabulary, reading texts, and practice activities related to architectural engineering and building information. The results indicated that the developed handbook was valid, practical, and suitable to support students in improving their English skills for academic and professional purposes.

1. Introduction

English is widely recognized as the language of international communication and proficiency is essential for professionals to collaborate and communicate effectively with colleagues from different linguistic and cultural backgrounds.¹ In the field of architectural engineering and building information, English language skills are essential for understanding technical documents, participating in international projects, and communicating with clients and stakeholders from different countries.² Therefore, designing an English course guide that meets the needs of the department can help students compete globally and prepare them for future careers.

To effectively promote active learning, critical thinking and problem-solving skills among students, teachers must use a variety of strategies that address diverse learning needs. These strategies include the use of technology, project-based learning and collaborative learning approaches that foster a sense of community and increase student engagement.³ This strategy not only plays a role in creating an inclusive learning environment where every student feels supported and valued, but also facilitates the establishment of interesting, practical and motivating learning media. By using a variety of media that match students' needs and interests, teachers can increase students' engagement in the learning process. Interesting and practical learning media allow students to learn in a more enjoyable and effective way, thus strengthening their understanding of the learning material and increasing their motivation to actively participate.

The availability of resources tailored to the specific needs of students in architectural engineering and building information engineering is admittedly limited, which can then affect the development of English language skills in these departments.⁴ While there may be general English textbooks or resources available, they often lack contextual relevance and specificity to address the language needs of students studying architectural and building information engineering. This gap is a challenge for both students and educators, as they must navigate the complexities of technical English in their field.

Muh. Arfah's study in 2020 on Students' Perceptions of English Textbooks at SMKN 2 Palopo revealed the diversity of students' perceptions of the textbooks, where the majority doubted their effectiveness due to the variety of teaching methods used. Data from the questionnaire showed that 55.3% of students had doubts about the content and delivery of the textbook.⁵ The results of the study were complemented by Reski Nur Hidayah's research in 2023 at SMKN 2 Palopo, which found a number of problems, including difficulties in finding the main idea in the text, limited vocabulary acquisition, difficulties in understanding vocabulary, as well as low levels of English language acquisition among students.

The results of the needs analysis of students at SMKN 2 Palopo related to English language learning revealed several important aspects. Firstly, students' main purpose in learning English is to facilitate access to information related to

their majors and to be able to communicate in English properly. In addition, students also demonstrate the need for reading, speaking and writing skills. In terms of weaknesses, the majority of students experienced difficulties in finding the main idea in the text and understanding vocabulary. Furthermore, from the desire aspect, students expressed the desire to recognize vocabulary of objects in the field of study, activities carried out in the field of study, and vocabulary about rooms at school. There are also students' preferences related to vocabulary learning with pictures, where neutral colours are the top choice followed by cold and warm colours. In conclusion, understanding students' needs and preferences can be an important basis for designing effective and context-appropriate English language learning.

As a solution to the challenge of providing resources tailored to the specific needs of students in architectural engineering and building information engineering, one step that can be taken is the provision of a specialized vocabulary handbook.

This handbook will be specifically designed to introduce and explain technical terms that are frequently used in the literature and technical practice in these fields. With this handbook, students will have a more relevant and specific resource to expand their English vocabulary in a technical context. In addition, this handbook can also be a useful reference for educators in developing learning materials that are more focused and relevant to students' needs. Thus, the provision of a specialized vocabulary handbook can be a concrete step in improving the quality of English learning in architectural engineering and building information departments.

In order to overcome the challenges of limited resources and improve the quality of English learning in the Department of Architecture and Building Information Engineering at SMKN 2 Palopo, the researcher aims to design a guide entitled "English Language Guide for the Department of Architecture and Building Information Engineering at SMKN 2 Palopo". This guide is specifically designed to assist students in this department in understanding and using appropriate vocabulary, phrases and expressions. With this guide, students are expected to overcome difficulties in understanding English technical texts and improve their ability to communicate and write in English in the field of architecture and building information engineering.

2. Method

This research used the Research and Development (R&D) approach with the 4D model (Define, Design, Develop, and Disseminate) to develop a customized English vocabulary book for students of the Architecture and Building Information Engineering Department at SMKN 2 Palopo. During the development process, learning objectives and student needs were collected as the basis for the final product. The learning design included lesson plans for teachers, learning tasks,

materials, vocabulary and technical expressions, and other supportive elements. Therefore, this method is considered appropriate to produce a handbook that is suitable for the needs of students in the department.

Following the computation of the total score, the researcher used the following formula to determine the average score:

$$M = \frac{B}{N} \times 100\%$$

M = Mean score

B = Total score

N = Total number of values

After determining the mean score, the researcher proceeded to calculate the value. The investigator employed the subsequent formula:

$$\chi = \frac{M}{N} 100\%$$

X = The value

M = Average score

N = Total number of values

3. Result

In this study, the researcher used 4D method, which explained individually to describe the research process and result.

1. Define

- a. The questionnaire results with students of Architectural Engineering and Building Information.

In designing the vocabulary book materials, researchers need to collect the required student data. The researcher distributed questionnaires related to student needs and learning needs. Before being distributed to students, the questionnaire was validated by an instrument validator. The result of the questionnaire validation is shown below.

Table 1. The Results of questionnaires' validation by the experts

| Aspects | Score |
|----------------------|--------------|
| Contents | 5 |
| Desing and Layout | 4,5 |
| Language | 5 |
| Average Score | 4,83 |

The instrument validation process yielded an exemplary score of 4.83, which falls within the "Excellent" category. This high score reflects the quality, clarity, and relevance of the instrument, which meets the standards required for effective data collection. Additionally, feedback from experts in the field of design and layout was positive, confirming that the format and appearance of the instrument were functional and easy to use. Based on their assessment, the instrument was ready for use with no revisions required, indicating that it met professional standards in terms of usability and visual clarity. This validated instrument is now ready to be used in the research process.

b. The Result of the Need Analysis Questionnaire

In developing the materials for the vocab book, the researcher gathered data on student's requirenments. The needs analysis questionnaire comprised 16 multiple- choice question, which were grouped into three categories:target needs (needs, lacks and wants).

2. Design

At the design stage, researchers designed products based on the needs analysis, observations, and interviews that had been conducted previously. Researchers began designing the content of the book by determining relevant topics and designing the content of the book with an attractive design. At this stage, researchers design products using Canva Pro.

Table 2. The Blueprint of the Product

| Dimension | Elements of the Book | Objective |
|--|-----------------------------|---|
| Vocabulary about Architectural engineering and | Vocabulary | The objective of acquiring fundamental architectural terminology, particularly in the context of English, is to enhance one's linguistic competence within the professional domain of architecture. |
| Building information | | This includes enhancing the capacity to communicate with international architects, clients, and colleagues, as well as cultivating a more profound comprehension of the quotidian context of architectural practice, whether in academic settings, construction projects, or urban planning. Additionally, proficiency in architectural technical vocabulary fosters comprehension of architectural literature, technical drawings, and project documents, while also honing communication skills in design presentations, written reports, and professional discussions. |
| | Picture | The utilization of visual media in vocabulary learning has been demonstrated to be a highly effective strategy for enhancing comprehension and memory. The integration of visual representation and lexical meaning facilitates the formation of a relationship that is more readily discernible by the learner. This facilitates the association of words with concrete objects or concepts, thereby accelerating the comprehension process and increasing vocabulary |

| | | |
|--|-----------------|--|
| | | retention over a longer period of time. Furthermore, the integration of visual aids, such as pictures or illustrations, has been demonstrated to facilitate comprehension of the learning material, thereby enhancing the overall learning experience. |
| | Phonetic symbol | The utilization of phonetic symbols constitutes a pivotal element in the acquisition of precise pronunciation in the English language. These symbols facilitate language learning by providing a standardized reference point for correct pronunciation, independent of variations in accent or pronunciation patterns exhibited by native speakers. This is of particular importance because the variations in English accents and pronunciation can be perplexing, particularly for individuals who are in the initial stages of acquiring the language. The utilization of phonetic symbols has been demonstrated to assist in the minimization of pronunciation errors, thereby enhancing clarity and accuracy in communication. This, in turn, fosters more effective and professional communication. |
| | Color | The use of color in vocabulary books has been shown to enhance memory and comprehension in a more visual way. This is due to the ability of colors to differentiate or categorize specific groups of words, making it easier for learners to identify and retain words within a structured framework. Additionally, the use of color helps clarify the relationships between words or concepts, making the |

| | | |
|--|--------------------------------------|---|
| | | learning process more engaging and enjoyable. As a result, vocabulary learning becomes more effective, as colors capture attention, thereby improving both memorization and comprehension. |
| | Materials (Phrase & conversation) | The primary objective of the book was to equip readers with the necessary vocabulary, conversational expressions, and idiomatic phrases in English. By mastering these essential elements, readers were able to communicate effectively, access information more easily, and interact with native speakers or professionals in various contexts. The book was designed to assist readers not only in everyday conversations but also in professional interactions, whether in the workplace, academic settings, or social environments. Furthermore, the knowledge of appropriate vocabulary and expressions enabled readers to better engage with various sources of information, such as literature, media, and learning materials. Overall, the book aimed to enhance the communication skills of readers, allowing them to engage with native speakers or professionals more fluently, accurately, and confidently. |

The researcher delineated the components of the Vocabulary Hand Book related to the field of architecture, commencing with the unit and its corresponding learning objectives. This book includes essential technical vocabulary in architecture, such as terms used in design, construction, and urban planning. The following table provides a comprehensive overview of these elements, which encompass specialized terminology as well as explanations of architectural concepts relevant to students and professionals in this field.

3. Develop

After the initial draft was completed, the next stage was the validation process conducted by experts in related fields. In this case, the product was validated by three experts, namely design and layout experts, linguists, and material experts.

Table 3. Table of Students' Perceptions

| No | Criteria | Score | Description | Follow Up |
|----|---|-------|-------------|-------------------------------------|
| 1. | The material presented in the English Vocabulary Book for the Architectural Engineering and Building Information is in accordance with the needs of SMKN 2 Palopo students. | 4,8 | Very Good | It can be utilized without revision |
| 2. | The material in the English Vocabulary Book for the Architectural Engineering and Building Information as a whole varies. | 5 | Very Good | It can be utilized without revision |
| 3. | The materials presented help to increase students' interest and understanding in learning English. | 5 | Very Good | It can be utilized without revision |
| 4. | The material of English Vocabulary Book for the Architectural Engineering and Building Information is interesting and appropriate for modeling design and building information students at SMKN 2 Palopo. | 4,7 | Very Good | It can be utilized without revision |
| 5. | The selection of images in the English | 5 | Very Good | It can be utilized without revision |

| | | | | |
|----|---|-----|-----------|--|
| | Vocabulary Book for the Architectural Engineering and Building Information is interesting and appropriate for modeling and building information design students at SMKN 2 Palopo. | | | |
| 6. | The material topics in the English Vocabulary Book for the Architectural Engineering and Building Information are easy for students to learn independently. | 5 | Very Good | It can be utilized without revision |
| 7. | The selection of font type and size in the English Vocabulary Book for the Architectural Engineering and Building Information is attractive and comfortable to read. | 4,7 | Good | It can be utilized with a little bit of revision |
| 8. | The selection of colors in the English Vocabulary Book for the Architectural Engineering and Building Information is interesting and fun to read. | 4,9 | Very Good | It can be utilized without revision |
| 9. | The cover design of the English Vocabulary Book for the Architectural Engineering and Building Information is Attractive. | 4,9 | Very Good | It can be utilized without revision |

| | | | | |
|-----|---|-----|-----------|-------------------------------------|
| 10. | The book design of English Vocabulary Book for the Architectural Engineering and Building Information is interesting. | 4,9 | Very Good | It can be utilized without revision |
| 11. | The size of the English Vocabulary Book for the Architectural Engineering and Building Information is appropriate, practical, and easy to carry around. | 4,9 | Very Good | It can be utilized without revision |

4. Disseminate

In this stage, the researcher distributed the book and questionnaire to the respondents. The book that was distributed had been validated and revised by the validator to ensure its quality and suitability. Additionally, the questionnaire consisted of 10 questions designed to gather students' responses to the book. The purpose of distributing the questionnaire was to obtain feedback on how well the book met the students' needs and expectations.

This presentation provides a comprehensive overview of the process of socializing the Vocabulary Book of Architectural Engineering and Building Information to teachers and students majoring in Architectural Engineering and Building Information at SMKN 2 Palopo:

The results of the needs analysis showed that the majority of students expressed a high interest in learning vocabulary related to their daily lives, especially those related to their living environment, academic activities in the field of architecture, and social interactions in the context of architecture profession and study. In addition, the students showed a preference for books that are equipped with attractive visual illustrations, such as technical drawings or architectural sketches, and have a practical size, for example A5 size. The validation results from the experts showed that the research instruments were of high quality, with an average score of 4.89.

The developed book also received excellent ratings in terms of design, use of technical language, and material relevant to the field of Architectural Engineering and Building Information, with an average score between 4.7 and 5. Revisions made included refining phonetic symbols in English, adding technical vocabulary in the context of architecture and building, and adjusting the size of the book to make it more practical to use.

The product trial showed the effectiveness of illustrated vocabulary books in increasing interest in learning English among students majoring in Architecture and Building Information Engineering. Most students, 98%, expressed increased motivation to learn using vocabulary books relevant to their field of study. In addition, the book received positive responses from students and lecturers, with an average score of 4.8 from students and 4.9 from lecturers, indicating that the book is suitable for learning needs in the context of architecture and building information. Therefore, this multilingual illustrated vocabulary book is considered as an effective medium to improve students' vocabulary comprehension.

4. Discussion

This research was motivated by the challenges faced by students in the Department of Architecture and Building Information Engineering at SMKN 2 Palopo in learning English, particularly in understanding technical texts and vocabulary relevant to their field of study. Many students had difficulty understanding technical vocabulary used in literature and practice in the field of architecture, which resulted in low English proficiency. Additionally, the limited availability of learning resources tailored to the specific needs of the students further worsened the situation. Therefore, the development of more focused and relevant learning materials was necessary to help students improve their English skills, especially in the academic and professional context related to architecture.

To address this issue, this research aimed to design an English handbook specifically for students in the Department of Architecture and Building Information Engineering. The handbook focused on introducing and explaining technical vocabulary commonly used in literature and practice in the field of architecture. With this handbook, it was hoped that students would find it easier to understand relevant technical vocabulary and improve their communication and writing skills in English.

The development of the handbook followed the 4D model, consisting of four stages: Define, Design, Develop, and Disseminate. In the Define stage, a needs analysis was conducted to identify students' expectations regarding the content of the handbook. The Design stage involved collecting relevant information and input from various sources to design the handbook. In the Develop stage, the initial design of the book was created and validated by experts to ensure the appropriateness and validity of the content. Afterward, revisions were made based on the validation results. The final stage, Disseminate, involved distributing the completed and validated handbook to students and other stakeholders.

Several studies supported the importance of developing English learning materials tailored to the specific needs of students in technical fields. Yuliani et al. showed that developing teaching materials based on technical needs improved students' English proficiency.²² Muliawati et al. also emphasized the effectiveness of the English for Specific Purposes (ESP) approach in enhancing students' English

skills with a focus on technical vocabulary.²³ Furthermore, the research by Wijaya & Sari revealed that materials relevant to students' areas of expertise, such as architecture, helped improve their understanding of English.²⁴ These findings provided a basis for developing the English handbook focused on technical vocabulary to help students overcome challenges in learning English in the field of architecture.

This research made a significant contribution to the development of English learning materials suited to the specific needs of students at SMKN 2 Palopo. With this handbook, it was expected that students would improve their understanding of technical vocabulary and their communication skills in academic and professional contexts. Additionally, this research opened opportunities for further studies on the development of learning materials in other technical fields and provided references for educators in designing curricula that are more responsive to students' needs.

5. Conclusion

This research aimed to design an English handbook specifically for students in the Architectural Engineering and Building Information at SMKN 2 Palopo. The final result of this research was the development of a handbook designed used the 4D model (Define, Design, Develop, and Disseminate), which aimed to help students understand and use vocabulary and technical terms relevant to their field of study.

The research gap was evident from a previous study conducted by Nurhaliza, which focused on developing English learning materials for students in the automotive department. While using the same approach, this research targeted the specific needs of students in the architecture department, highlighting the need for developing more contextual and relevant materials for their field of study.

The handbook included several components, such as vocabulary for practical tools, classroom tools, architectural verbs, professional terms, and conversation vocabulary. Each chapter was designed to help students understand and use relevant vocabulary in both academic and professional contexts.

The validation results showed that the book met the quality criteria in terms of layout, content, and language. After undergoing revisions based on feedback from the validators, the book was distributed to students through both physical and digital

methods. This distribution process aimed to ensure that students could access and utilize the handbook to improve their English skills in the context of architectural engineering and building information.

6. References

- Arthur, J., and P. Martin. 2006. "Accomplishing Lessons in Postcolonial Classrooms: Comparative Perspectives from Botswana and Brunei Darussalam.
- Baxriddinova et al. (2020) state that a picture can make it easier for learners to remember information compared to text alone. Importantly, images help activate cognitive processes in the brain, thereby motivating students to achieve better vocabulary retention.
- Berlian, L., & Gutlohn, L. (2006). Mengajar kosakata. Diperoleh dari situs Reading Rockets: <http://www.membaca.roket.org/artikel/kosakata-pengajaran> .
- Bustomi, B., Sukardi, I., & Astuti, M. (2024). Constructivist thought in the cognitive education theory of Jean Piaget and Lev Vygotsky. *Journal of Education and Teaching Review (JRPP)*, 7(4), 16376–16383.
- Chandra, M. R. (2022). Using FlipGrid to improve memory ability in learning foreign languages. *Lingua Cultura*, 16(2), 241-247.
- Creese and Blackledge (2011) state that the concurrent use of two languages may be applied by teachers, children, or both.
- Deldenia, M., Khatibi, A., Azam, S. M.F. (2018). An analysis of students' motivation and attitudes toward learning the Japanese language as a foreign language in secondary schools in Sri Lanka. *European Journal of Foreign Language Teaching*.
- Dörnyei, Z. (2001). New themes and approaches in second language motivation research. *Annual review of applied linguistics*
- FADLI, I. (2022). *Designing A Colorful Pictorial English Vocabulary Book for the First-Grade Students of Smp Datok Sulaiman Putri Palopo* (Doctoral dissertation, Institut Agama Islam Negeri (IAIN) Palopo).
- Furwana, D. (2023). Developing English Material for Sharia Economy Study Program at IAIN Palopo. *Language Circle: Journal of Language and Literature*, 17(2), 309-316.
- Geddes, A. J. (2016). Korean university students' attitudes and motivation towards studying English. *Universal Journal of Educational Research*.
- Graddol, D. (2006). *Why Global English may Mean the End of "English as a Foreign Language"*. United Kingdom: British Council.
- Hurst, J. (1997). *Talk From the VI Teachers' Lounge*.
- Indriani, K. S. (2021). Motivation of RSD Mangusada Badung-Bali employees in learning English. *Diglosia: Journal of Language, Literature, and Teaching Studies*.
- Lee, S., & Choi, Y. (2022). The Effect of E-books on Young EFL Learners' Vocabulary Acquisition and Parents' Perceptions of E-books. *영어학*
- Lewis, R. M., & Kennedy, M. R. (2019). The big picture: A holistic view of E-book acquisitions. *Library Resources & Technical Services*.

- RANTE PADANG, S. H. (2023). Designing English Vocabulary Application for the Seventh Grade Students of Smp Datok Sulaiman Palopo (Doctoral dissertation, Institut Agama Islam Negeri (IAIN) Palopo).
- Yahya, A., & Husnaini. (2023). Common expressions in Indonesian traditional market: Multilingual: English, Indonesian, and Mandarin (Editor: Wulandari Putri, N., & Mustika, M.). PT Pena Kerta Utama.