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Designing Mobile Application Dictionary Based on Students' Needs for Enhancing IT-Focused English Vocabulary

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Abstract

The present study aims to design a mobile application dictionary that caters to students' needs for enhancing IT-focused English vocabulary. The study explores the effectiveness of the designed mobile application in improving students' IT-focused English vocabulary, their engagement in vocabulary learning, and their overall satisfaction with the application. This research aims to design a mobile application dictionary to enhance IT-Focused English Vocabulary. The study employs a mixed-methods approach, combining qualitative interviews and a quantitative survey, to understand the design requirements, implementation strategies, and effectiveness of the mobile application dictionary. The qualitative phase involves semi-structured interviews with IT students and subject matter experts to gain insights into the learners' challenges, preferences, and needs, as well as the crucial IT English vocabulary concepts. The quantitative phase evaluates the impact of the mobile application dictionary on IT students' vocabulary knowledge, confidence, and overall satisfaction through a survey. The integrated findings will provide a comprehensive understanding of the factors that contribute to the success of mobile application dictionaries in enhancing IT students' informatics English vocabulary, with practical implications for the development of similar language learning tools.

Keywords: IT-focused English vocabulary, Mobile application, Students need

INTRODUCTION

Mobile learning has become an increasingly popular approach to education, particularly in the field of language acquisition. The integration of mobile devices, such as smartphones and tablets, into the learning process, has opened up new opportunities for students to access learning

materials and practice their language skills anytime and anywhere.

The effectiveness of mobile learning in language education has been well-documented in the literature. Studies have shown that students who use mobile applications for language learning tend to retain more vocabulary and have higher levels of confidence and class participation than those who rely solely on traditional methods (Klimova, 2019). Furthermore, the flexibility and multisensory nature of mobile learning, which allows for the integration of various media formats, have been identified as key factors in improving language learning outcomes (Klimova, 2019)

Countries worldwide encourage educators to employ computer-assisted gadgets for teaching purposes in response to the global information era. But why is using internet resources crucial when learning a language?

Here are a few potential responses (Sykes, 2013), (AlCattan, 2014).

1) It establishes a link between educators and learners.
   Teachers and students only interact in the classroom when they are in a typical classroom. But now that the Internet has grown, people may talk to each other via instant messaging apps like Facebook, Line, or email.
2) The use of computers in the classroom has given way to cloud computing (AlCattan, 2014), (Zheng, 2012). Multimedia with audio or visual features used to be sufficient for teaching and learning. But now that the iPad, iPhone, and other Android tablets have become popular, there are more options.
3) The growth of tablets and cloud computing has also led to the development (B. X. N. Wang & Li, 2011), (Hung et al., 2012) of the course management system. For instance, a lot of teachers combine the curriculum, student learning portfolio, and handouts using Moodle or Blackboard.

With the increasing demand for English proficiency in the IT industry, it is essential that students pursuing IT-related courses develop a strong command of IT English vocabulary. Mobile applications have emerged as a promising tool to support language learning, offering personalized and autonomous learning experiences (Klimova, 2021). However, the effectiveness of mobile applications in enhancing IT-focused English vocabulary among students remains an area that requires further exploration.

From an education management perspective, an important role that must be played is to ensure that English learning applications remain relevant and continuously updated by the latest developments in the fields of information technology and education. Education management must be responsive to global and local changes due to technological developments which have a direct impact on the teaching and learning process through changes in curriculum, pedagogical practices and assessment. How educational management as a discipline evolves to effectively meet the needs of educational systems that are subject to challenges stemming from the technological, social, cultural, and economic changes sweeping the world in the first decade of the 21st century will determine the effectiveness and efficiency of management practices in the next future (Lynch et al., 2020). This is necessary to accommodate students' needs in learning English which is increasingly focused on IT competencies. As part of educational management, the use of IT technology as a learning tool and to improve English language skills is a very important aspect and needs to be studied further, so that the applications developed can be truly effective and based on students' needs.

This research paper aims to explore the design considerations for a mobile application dictionary tailored to the specific needs of IT students, with the goal of enhancing their proficiency in IT-English vocabulary. The

review of relevant literature suggests that mobile applications can provide significant benefits for vocabulary learning, such as flexibility, multimodal support, and opportunities for autonomous practice (Ma, 2021). Additionally, the design of such applications should consider the unique learning preferences and challenges faced by IT students (Xie, 2014). To achieve this objective, the study will employ a mixed-methods approach, involving both qualitative and quantitative data collection and analysis.

Mobile applications have significant potential in enhancing language learning, particularly in the context of vocabulary acquisition (Ma, 2021). However, the specific design considerations for a mobile application dictionary tailored to IT students' needs have not been extensively explored.

This research seeks to bridge this gap by investigating the design elements and functionalities that can effectively support IT students in developing their IT English vocabulary through a mobile application.

The existing literature highlights the potential benefits of mobile applications in language learning (Elaish et al., 2017). Mobile apps offer unique features such as personalization, ubiquity, and multimodal support that can enhance vocabulary acquisition by freeing learners from the constraints of time and place. A review of studies on mobile English language learning found that the majority of research focused on the use of mobile applications, indicating their widespread adoption in this domain.

The literature also suggests that the design and features of mobile applications play a crucial role in their effectiveness. Adjusting the application to learners' needs and self-regulation strategies is crucial for achieving positive learning outcomes (Klimova, 2021), (Ma, 2021), (Elaish et al., 2017), (Kacetl & Klímová, 2019).

In the concluding section, this research paper summarizes the key findings from the literature review and the mixed-methods study. The implications of the study for the design of mobile application dictionaries for IT-focused English vocabulary learning will be discussed, along with recommendations for future research in this area.

METHODOLOGY

To address the research objective of designing a mobile application dictionary that enhances IT-focused English vocabulary among students, this study employed a mixed-methods approach, combining quantitative and qualitative data collection and analysis.

A. Problem Definition

Based on the stated previously the researcher had formulated research questions as follows: What are the needs of the students at Mulia University IT-Focused English Vocabulary, What is the designed mobile application IT-focused English vocabulary based on students' need, How is the Mobile Application Dictionary based on students' needs for Enhancing IT-Focused English Vocabulary in term of effectiveness and What is the students' and Lecturer's perception on the designed Mobile Application Dictionary IT-Focused English Vocabulary?

B. Data Collection

To address the research objective of designing a mobile application dictionary to enhance IT students' IT English vocabulary, this study used the design ADDIE model utilised by Research and Development (R&D) (McGriff, 2000). The five primary stages of the ADDIE model are analysis, design, development, implementation, and evaluation. The study was carried out at Mulia University of Balikpapan the address of the college.

There were two types of data used in this research, there was a mixed-methods approach, combining qualitative and quantitative data

collection and analysis. The qualitative phase of the study will involve semi-structured interviews, with IT students and subject matter experts. The use of theoretical frameworks is a key aspect of semi-structured interviews, as they provide the guiding principles for the research process [(Adams, 2015). The interviews with IT students will aim to understand their challenges, preferences, and needs in acquiring IT English vocabulary, as well as their perceptions of the potential benefits and design requirements of a mobile application dictionary. The interviews with subject matter experts, such as English language instructors and students, will provide insights into the key IT English vocabulary concepts that are crucial for IT students, as well as their perspectives on effective strategies for vocabulary acquisition.

The quantitative phase of the study will involve a survey to assess the effectiveness of the mobile application dictionary in improving IT students' English vocabulary. The survey will be designed to measure the participants' vocabulary knowledge, confidence, and overall satisfaction with the mobile application.

The survey data analyzed using statistical methods, such as t-tests, and likert scale, to determine the impact of the mobile application dictionary on IT students' English vocabulary development.

The qualitative and quantitative data will be integrated to gain a comprehensive understanding of the design requirements, implementation strategies, and effectiveness of the mobile application dictionary in enhancing IT students' English vocabulary.

RESULT AND DISCUSSION

1. The needs of the students at Mulia University IT-Focused English Vocabulary

What skills and expertise the learner needs to be successful in the development process. To get more detailed information on the needs of the students, a questionnaire was distributed to them, the English lecturer was interviewed, and twenty six students participated in focus group discussions. Some of the statements on the questionnaire used a Likert scale. It sought to determine the learning needs of the pupils using the three kinds of needs—necessities, lacks, and wants—as (IS & Macalister, n.d.). The learning demands of the kids are further explained as follows:

a. Necessities

Necessities is which information the student must possess in order to perform well (Adams, 2015). The outline of the students‟ view is as follows:

Table 1. Necessities

Aspect of Learning Needs	Items of Learning Needs	Students Response	Source
Necessities	Students‟ view and interest in English vocabulary mastery	Interactive and Engaging Learning Methods	Que No 2 & FGD
		Relevance to Academic and Professional Goals	Que No 3 & FGD
		Technology-Enhanced Learning	Que No 11 & FGD
	Students‟ view about using technology in English vocabulary	Interactive Learning Tools	Que No 13 & FGD
		Multimedia Resources	Que No 17 & FGD
		Ease of Use	Que No 23 & FGD

Based on the result of the questionnaire, all of the students perceived that interactive and engaging learning methods are important, even most of them 20 (47.1%) strongly agreed with it. The students' strongly agree about Relevance to Academic and Professional Goals 25 (59.5%) was essential in order to improve their vocabulary mastery. Further, in FGD they said that having English vocabulary mastery would be beneficial for their future study and career. Therefore, they realized that they had to master English vocabulary. Further, all of the students perceived that using technology in enhance learning English vocabulary is very important. There were about 22 (52.4 %) students strongly agreed and 12 (28.6 %) students agreed with it and based on another data the number of the students who were interested in learning English using technology was more than the number of students who did not really enjoy learning English using technology. Further, in FGD they said that the use of technology like mobile application in learning English vocabulary is more interesting and flexible than only using book and it could support their language learning.

Another hand most of the students perceive that Interactive Learning Tools is very important it can be showed based on the result of the questionnaires that 26 (61.9%) students strongly agree and only 4 (4.8%) students disagree with it, furthermore multimedia resources very important shown the students 23 (54.8%) strongly agree and 24 (57.1%) students strongly agree view about using technology in English vocabulary for ease to use. It was who proposed that mobile technologies provide many advantages (Viberg & Grönlund, 2012). They have flexibility, low cost, small size, and user-friendliness.

b. Lacks

Another category was Lacks is what the learner knows and does not know already (Adams, 2015). The data can be shown as follows:

Table 2. Lacks

Aspect of Learning Needs	Items of Learning Needs	Students Response	Source
Lacks	Students' current level of English vocabulary	Word Recognition	Que No 1 & FGD
		Pronunciation	Que No 2 & FGD
		Simple Sentence Construction	Que No 4 & FGD
	Students' skill in express ideas in English	Vocabulary Expansion	Que No 7 & FGD
		Fluency and Cohesion	Que No 9 & FGD
		Pronunciation and Intonation	Que No 10 & FGD
	Students' current level of using technology	Fundamental Digital Literacy	Que No 17 & FGD
		Online Safety and Etiquette	Que No 18 & FGD
		Basic Learning Tools	Que No 19

Aspect of Learning Needs	Items of Learning Needs	Students Response	Source
			& FGD
	Students' Problem in Vocabulary	Limited Vocabulary Range	Que No 20 & FGD
		Pronunciation Problems	Que No 23 & FGD
		Technology Integration	Que No 34 & FGD

Based on the resulting questionnaire above, Students' current level of English vocabulary in Word Recognition is important than the other it can be shown based on the results that 22 (52.4%) students strongly agree other hand Pronunciation is very needed in vocabulary perception there are 28 (66.7%) students strongly agree and 22 (52.4%) students strongly agree about Simple Sentence Construction.

Students' skill in express ideas in English shown Vocabulary Expansion is very important the others there are 30 (71.4%) students strongly agree, there are 27 (64.3%) Fluency and Cohesion strongly agree and 30 (71.4%) students strongly agree about Pronunciation and Intonation.

Furthermore, Students' current level of using technology especially Fundamental Digital Literacy is the highest of the other 34 (81.0%) students who strongly agree, Online Safety and Etiquette 20 (47.6%) strongly agree and there are 23 (54.8%) students strongly agree for basic learning tools vocabulary.

Moreover, for Students' Problems in Vocabulary, there are several points for the questionnaire but Limited Vocabulary Range shows 21 (50.0%) students strongly agree for vocabulary perception, for Pronunciation Problems again the students lack and need to improve 24 (57.1%) students strongly agree It was also supported by the result of FGD most of students still have difficult in every aspect of vocabulary like as word meaning, word form, word class, word use and pronounce the word and 38 (90.5%) students the higher perceive that Technology Integration were strongly agree for vocabulary enhance context.

c. Wants

Wants refer to what the learners think they need (Adams, 2015). It addresses the learning preferences of the students. The following are the learning interests and preferences of the students:

Table 3. Wants

Aspect of Learning Needs	Items of Learning Needs	Students Response	Source
Wants	Diverse Range of Materials	Digital resources	Que No 4 & FGD
	Quality and Relevance	Current and Up-to-Date Content	Que No 5 & FGD
	Engagement and Interactivity	Interactive Activities	Que No 8 & FGD
	Practical Application	Functional Language	Que No 11 & FGD

Aspect of Learning Needs	Items of Learning Needs	Students Response	Source
	Technological Integration	Interactive Software	Que No 14 & FGD
	Comprehensive Coverage	Word Lists and Flashcards	Que No 15 & FGD
	Practice and Assessment	Feedback Mechanisms	Que No 20 & FGD
	Supportive Resources	Dictionaries and Thesauruses	Que No 21 & FGD
	Accessibility and Usability	User-Friendly Design	Que No 24 & FGD
	Customization and Personalization	Adaptive Learning Materials	Que No 27 & FGD

The findings of this research indicated that most of the students perceived Diverse Range of Materials in Digital resources is the most important for enhance vocabulary context in the last trend era it can be showed that 34 (81.0%) students strongly agree, furthermore Quality and Relevance especially for Current and Up-to-Date Content there are 30 (71.4%) students strongly agree and 28 (66.7%) students strongly agree for interactive activities students perception.

In addition practical application in functional language 19 (45.2%) students strongly agree, for technological integration of Interactive Software 28 (66.7%) students strongly agree It was also supported by the finding from the FGD that the students were more enthusiastic to study English by using smart application mobile dictionary for specific purpose in IT. It also supposed for Word Lists and Flashcards that 24 (57.1%) students strongly agree to support the need to increase vocabulary and 22 (52.4%) students strongly agree for Feedback Mechanisms in Practice and Assessment.

The suggested English app boosted pupils' enthusiasm for picking up vocabulary in the language. Additionally, students use their smartphones to learn in a more comfortable manner (B.-T. Wang, 2017). There are correlation with students result questionnaire that Supportive Resources for Dictionaries and Thesauruses 30 (71.4%) students' strongly agree for the perception, furthermore 26 (61.9%) students choose user friendly when Accessibility and Usability and the last there are 22 (52.4%) students strongly agree on Adaptive Learning Materials in Customization and Personalization. In spite of the data obtained from the questionnaire and focus group discussion, the outcomes of 20 student interviews were consulted in order to determine the learning needs of the students, specifically with regard to learning more about the activities and resources for vocabulary that are accessible.

2. Design mobile application IT-focused English vocabulary based on students' need

The stages of design mobile application IT-focused English vocabulary based on students need are reflected in the following figure:

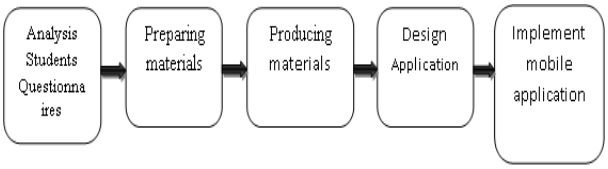

Figure 1. The Stages in Designing mobile application.

The design of the mobile application dictionary for IT-focused English vocabulary learning was guided by the insights gathered from the student survey and the subsequent user testing of the prototype. The survey findings revealed that IT students often struggled with the acquisition of IT English vocabulary, as the terminology used in their field of study was highly specialized and context-dependent.

To address this challenge, the mobile application dictionary was designed to provide a comprehensive and user-friendly platform for IT students to learn and practice English vocabulary. The dictionary content was curated to include a wide range of technical terms and phrases commonly used in the IT industry, with a focus on areas such as computer hardware, software development, networking, cybersecurity etc. Here the UI of Mobile app IT Pocket Dictionary.

Figure 2. Application logo Mobile app IT Pocket Dictionary on the Android screen·

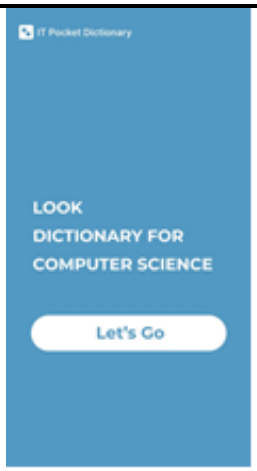

Figure 3. Initial display Mobile app IT Pocket Dictionary

The researcher can alter the app's appearance using the Android system. Therefore, the researcher created the webpage, which has a succinct overview of the application.

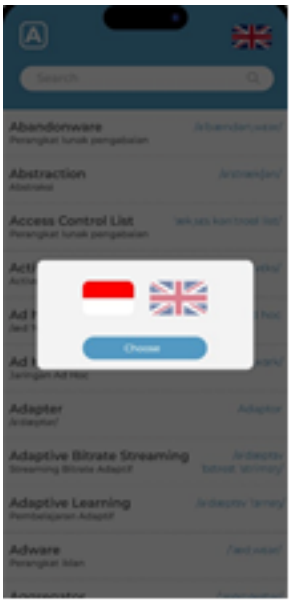

Figure 4. Language selection menu display

Based on the students questionnaires for Accessibility and Usability must be easy to use that 26 (61.9%) students strongly agree and 14 (33.3%) students agree user friendly for Accessibility and Usability.

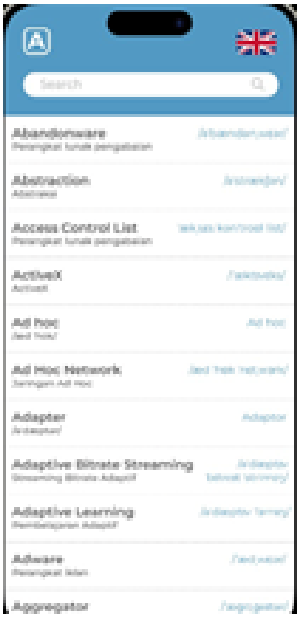

Figure 5. Content display

The content display refers to the students need that there must show the pronunciation, for the view and interest in English vocabulary mastery it Relevance to Academic and Professional Goals which specific purpose to IT.

3. Mobile Application Dictionary based on students' needs for Enhancing IT-Focused English Vocabulary in term of effectiveness.

The effectiveness of the product is conducted in informatics program at first semester and the classroom consist of 42 students. In the first meeting, the researcher delivered the procedure of the vocabulary measured. All the item are integrated with vocabulary key concept.

a. The standard deviation of students pretests and posttest

In this table below the researcher presented the standard deviation of the students pretest and posttest after in term vocabulary measured after being taught with English for information of technology.

Table 4. Standard Deviation of Students Pretest and Posttest

Key Items	Students Response					Students Response				
	1	2	3	4	Std Deviation	1	2	3	4	Std Deviation
Word Recognition	9	10	11	12	3,74	0	0	14	28	12,48
Spelling	2	15	15	10	3,90	0	2	5	35	12,56
Word Meaning and Usage	8	5	17	12	3,72	0	2	4	36	12,38
Relevance to Academic and Professional Goals	4	7	11	20	3,62	0	0	4	38	12,07
Collocations and Phrasal Verbs	9	11	17	5	3,18	0	2	12	28	11,47
Idiomatic Expressions	4	10	20	8	2,98	2	3	10	27	11,53
Word Formation	12	10	10	10	2,09	0	3	14	25	11,77
Reading Comprehension	11	12	10	9	2,26	0	2	14	26	12,14
Listening Comprehension	9	9	13	11	2,48	0	6	8	28	12,55
Writing	8	8	12	14	2,71	0	4	8	30	13,22
Speaking	9	12	14	7	2,78	0	0	12	30	14,05
Vocabulary Application	10	11	14	7	2,89	0	0	8	34	16,11

B. Test of Significance (T- test)

T-test is used to know the significant of improvement of students knowledge after the application of. the researcher used paired sample T-test that was a test to know the significance difference between the result of mobile application dictionary for IT-focused English vocabulary students mean scores in pretest and posttest. Assuming that the level of significance (α) = 0.05, the degree of freedom (df) = 42 where N-1 = 41, than the result of the T-test is presented in the following table;

Table 5. Probability Value of T-Test of The Students Achievement on Pretest and Posttest.

Variables	P - Value	(α)	Remarks
Pretest & Posttest	0.00	0.05	Significantly Different

The researcher discovered that the probability value (0.00) was greater than the level of significance at the t-table (0.05) based on the results of the data analysis described in the preceding table. We may conclude that students' informatics program achievement is

effective and that there is a considerable improvement in the mobile application dictionary for IT-focused English vocabulary.

4. *The students' and Lecturer's perception on the designed Mobile Application Dictionary IT-Focused English Vocabulary.*

The researcher provided the students a questionnaire to find out how they felt about the Mobile Application Dictionary IT-Focused English Vocabulary, which was designed with the needs of the students in sight. It can be concluded that students in Mulia University's informatics study program strongly agree with the dictionary's IT-focused English vocabulary that is focused on mobile applications, based on the results of a questionnaire given to them and the lecture on student perception. The average score of students' perception is 3.67. The lecture perception category is graded as strongly agree, with an average score of 3.60. It was possible to draw the inference that the lecturers highly agreed about the perception of IT-focused English vocabulary in mobile application dictionaries.

The findings of this research contribute to the understanding of how mobile application design can be leveraged to enhance IT students' English vocabulary, ultimately improving their academic and professional performance. The qualitative insights gathered from the interviews with IT students and subject matter experts will inform the design and development of the mobile application dictionary, ensuring that it aligns with the target users' needs and preferences.

The quantitative evaluation of the mobile application dictionary's effectiveness will provide empirical evidence on the impact of technology-assisted language learning on English vocabulary acquisition among IT students.

The integration of the qualitative and quantitative findings offered a nuanced understanding of the factors that contribute to the success of mobile application dictionaries in enhancing IT students' English vocabulary, which can inform the development of similar language learning tools for other specialized domains.

Overall, this research has practical implications for the design and implementation of mobile application dictionaries, as well as broader applications in the field of technology-assisted language learning

CONCLUSION

A. Conclusion

The development of English materials based on students' needs is started from the need analysis, design of teaching, design of the contents, development, and process of production (Zulkarnain, 2019). This research study aims to design a mobile application dictionary to enhance IT students' English vocabulary. The literature review highlights the potential of mobile applications in language learning, particularly in the context of vocabulary acquisition, while also emphasizing the importance of aligning the design with the specific needs and preferences of the target learners.

The mixed-methods approach employed in this study, which combines qualitative interviews and a quantitative survey, will provide a holistic understanding of the design requirements, implementation strategies, and effectiveness of the mobile application dictionary in improving IT students' English vocabulary.

The findings of this study will contribute to the existing literature on mobile-assisted language learning and offer practical insights for the design and development of mobile application dictionaries that cater to the unique needs of IT students. By addressing the challenges faced by IT students in acquiring English vocabulary, this research aims to enhance their academic and professional success

B. Suggestion

The pilot research created a mobile application dictionary for IT-focused English vocabulary. There are several restrictions and recommendations for further research on the subject based on the findings.

1) No Native pronouncing is present.
2) There is no online exam available in the suggested app.
3) The suggested app is only compatible with Android systems; users of iOS devices cannot use it for this study.
4) The proposed software is a pure dictionary; it does not include games or assignment tests. If further funding becomes available later on, the researcher plans to monitor user counts and enhance the app with features like quizzes, audio files, and dynamic assessment systems.

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