Development Model of Augmented Reality: A Need Analysis of Vocabulary Book for ESP Students

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Submitted: 06/01/2024 | **Revised: 25/01/2024** | **Accepted: 02/03/2024**

E-ISSN : 2579-4574 **P-ISSN : 2549-7359**

Abstract. The real challenge in 5.0 society requires meeting the needs of future generations who can use foreign languages and master technology. This study investigated the need for specific learning sources or materials for vocational students specifically majoring in Informatics Engineering in vocabulary learning. Since vocabulary is a fundamental language aspect of using English in reciprocal communications, this study is a type of survey research that uses quantitative and qualitative data analysis techniques. The instruments used to obtain the data were developed referring to the principal notion of a need assessment proposed by Hutchinson and Waters, validated by a language expert, and served through a questionnaire. The setting of this study involved 48 students of Vocational Students of Informatics Engineering at a private vocational school in Jakarta, Indonesia. The results showed that students of Informatics Engineering at vocational schools must be able to communicate in English, both written and spoken, using the specific term related to their department. Besides studying ESP to work, some students planned to continue to higher education with expertise in linear education. Therefore, they need to learn vocabulary with the integration of technology as they are supposed to deal with it in their field of work in informatics engineering to join the 5.0 society with the advancement of augmented reality-based media.

Keywords: *Technology, Augmented Reality, Vocabulary, English for Specific Purposes, Vocational School*

https://ojs.unm.ac.id/eralingua

INTRODUCTION

English skills in the era focused on preparing for 5.0 society are very much needed. Vocational school graduates must own English as an essential soft skill to be ready to enter the workforce. The 5.0 era requires working skills, foreign language competence, and literacy for sophisticated technology (Purwanto & Nurhamidah, 2021). The Industrial Revolution 5.0 created more qualified workers who could use cutting-edge technical equipment in this era of globalization (Apdillah et al., 2022). Simultaneously, the industrial sphere has been increasingly displacing human labor with machine surrogates to reduce financial costs. The thing is creating an innovative strategy that threatens human jobs (Huang & Rust, 2018). As a result, the labor market is becoming more competitive and emerging with a high unemployment rate (Ramadhan, 2011). The Indonesian government is making attempts to address the present industrial revolution scenario, one of which is to create vocational schools to lower high unemployment. Furthermore, it was clarified that vocational education and schools endeavor to provide students with skills or talents matching job requirements (Kholifah et al., 2020). Additionally, graduates can create jobs for themselves and open opportunities for others to join, so they can start working without having to seek a job; that is how impactful it is by focusing on developing vocational schools in Indonesia.

Furthermore, since the reform era, the Indonesian government has recognized the significant role of vocational education in global participation. The role of vocational schools in workforce culture is vital in the rapid development of a nation (Finlay et al., 1999); within the variety of its majors, graduates of vocational schools use specific English that is related to their expertise, particularly in the area of technology, having the competence to specific English is crucial.

Additionally, In Indonesia, the 5.0 event altered the ratio of senior high schools (SMA) to vocational schools (SMK) from 30% to 70%. According to the Long-Term-National Education Development Strategic Plan, the target ratio comparison of senior high schools to vocational schools in 2009 was 60:40. In 2015, it was 50:50, 40:60 in 2020, and 30:70 in 2025 (Suharno et al., 2020). The Indonesian government successfully implemented vocational programs by 2015, making them the fundamental pillar of national growth(Suharno et al., 2020). Therefore, it was also reported that new schools were built, and each area with regional autonomy had the opportunity to construct vocational high schools. Thus, in 2018, the goal of reversing the ratio showed a favorable trend, with a balance of 49.2%:50.8% between senior and vocational high schools. The development of vocational schools in Indonesia triggers the importance of developing the learning sources for specific English, which follows vocational students' expertise since English as a foreign language (EFL) has been instilled into the educational curriculum in Indonesia and standardized for the secondary level since 1989 (Lauder, 2008) until the independent curriculum is used in 2023. As a result, English is taught at all levels of education using the general English model. However, several schools need English teaching for specific purposes (ESP), especially vocational schools (Dizza et al., 2021). This means that general English instruction does not apply to all students because some students in vocational schools to be taught English, which has

specific terms because it will be used for particular fields and purposes regarding their expertise area (De Araujo, 2018). The ESP was popularly initiated to develop specific field interests in the early 1960s (Dudley-Evans & John, 2012). However, until now, English for particular purposes, such as for working in various fields, still requires the attention of linguists, educators, and the government, mainly to be applied in schools, especially in Indonesia (Prayoga et al., 2021).

The learning materials for ESP at vocational schools are lacking because it has not been explicitly created and could not be entirely designed for particular programs such as nursing programs (Paputungan et al., 2018), computer networking engineering(Prayoga et al., 2021), beauty study(Dizza et al., 2021), accounting department(Nawir et al., 2021)(Nartiningrum & Nugroho, 2020), tourism(Astawa et al., 2017) and also occurs in informatics engineering since it has not been much explored, especially in the area of learning materials for vocabulary learning. The novelty provided by this research focuses on analyzing the needs in designing learning resources by using technology integration, one of today's advanced technologies is Augmented Reality. This is potentially a solution for future learning and teaching needs when technology becomes part of all aspects of life. However, education in Indonesia is considered to be failing to meet future expectations with technology-integrated content due to not preparing it properly since previous research has been noted to be more concentrated on creating syllabi or designing a new curriculum for vocational high school students, which tends to vary from time to time based on the demands of a country's potential goals.

Experts agree that language learners depend heavily on their vocabulary size knowledge to master English because it is a prerequisite for learning the four language abilities of reading, writing, listening, and speaking (Loi et al., 2020). This indicates that vocabulary is critical to English language learning and significantly affects learners' language acquisition ability(Mangindaan et al., 2020). It was also noted that a person's linguistic proficiency is determined by the quantity and quality of their understanding of the vocabulary.

Furthermore, mastering vocabulary is not a matter of memorizing every word; instead, it is abouteing able to comprehend and actively using them in need (Susanto, 2017). Vocabulary types that vocational students need to learn are not the same as general senior high school students because each kind of education will require different types of vocabulary to be taught to their students. They expect more contextual materials, for they need specific preparation to enter the world of work (Kholifah et al., 2020). Therefore, providing appropriate materials for vocabulary learning for Informatics Engineering students is crucial because, without it, students will be unable to use and function if they may not have learned comprehensible communication with the vocabulary they should be familiar with (Saydaliyevna, 2022) primarily related to informatics engineering. Furthermore, with the goal of a broader scope, they can join the Indonesian representatives in the labor market and compete with foreign countries when they have eligible English communication skills related to their major. They possibly continue pursuing higher studies with related expertise, starting by learning specific vocabulary.

For this reason, designing the learning material the target students need is essential. Students of informatics engineering possibly learn and acquire vocabulary from various sources. Simultaneously, the media for students' vocabulary mastery is more accessible in the post-COVID-19 era when information and communication technology (ICT) rapidly developed (Chen & Li, 2021). Technology plays a dominant role over tools with non-technology because students today were born as digital natives(Li, 2021). For example, technology transforms the old learning style into the new one in the digital age (Pool, 2005). It is also possible to make an effort to improve student vocabulary mastery learning by transforming traditional methods (with no technology) to modern ones by leveraging technology. Therefore, incorporating current technology in enriching educational resources is critical, not only for keeping up with educational changes but also to give students of vocational school in informatics engineering programs a rich and specific vocabulary related to their work field in the future, and they can adapt with the rapid changing 5.0 of digitalization era.

Interest in ESP rose in the late 19th century(Chambers, 1980). Therefore, at the same time, the idea of needs analysis has come into being before every language lesson starts with a need analysis (NA), which is very important to the success of the learning process (Putrilani, 2018). Richards defined NA as "procedures used to collect information regarding learners' needs or target needs, and thus the information will be analyzed, referred to as needs analysis"(Richards, 1984).

Furthermore, according to (Hutchinson & Waters, 1987), target need is a catch-all phrase that, in practice, hides several significant differences. There are other things to keep in mind when conducting NA. For example, it is essential to consider the target situation in terms of needs, gaps, and wants. Moreover, input, processes, setting, and learners' and teachers' roles may also be considered part of the learning needs (Hutchinson & Waters, 1987). A need Analysis activity is an essential principle of the ESP approach because it helps language learners reach their goals and helps materials designers and teachers select the appropriate materials. As an approach, ESP commonly starts with investigating the learners' needs (Lapele, 2019).

Additionally, according to (Basturkmen, 2006), "needs analysis" is figuring out what students need to learn English to get the best materials. Also, he emphasized that the more practical the learning materials are, the easier it is for the students to use the language at work. A need analysis in ESP refers to teaching where students' prior knowledge, current beliefs, and future needs are considered to decide the language and skills they will use in the workplace. The content and approach of the ESP course are developed and improved using the data received from the requirements analysis. Hutchinson & Waters classify the needs into target and learning needs (Hutchinson & Waters, 1987). Those terms are defined as follows:

a. Target needs are the actions students must take in the targeted setting.
b. Learning needs are things learners need to know to do their jobs well in the target situation. This is a matter of looking at where the learners must work.

c. Learners' lack is the difference between how well they already know the language and how well they want to know it. This means that what the learners already know should be considered to determine their missing basics. It is shown as a difference between ideal or desired and real situations.
d. Learners-want refers to the circumstance in which students may have a distinct understanding of what the goal situation needs and does not. They are also aware of their needs and wants. The learner's motivation is crucial to the learning process. Hence, it is impossible to ignore their wants. The wants are connected to the learner's desires. When the students' learning preferences are concerned, learning English will help them advance in their careers.

ESP materials were made for students with specific needs that available materials could not meet(Nawir et al., 2021). Those requirements were largely observed in terms of the topic. For instance, physicians must be able to communicate in the language of medicine, pilots must be able to communicate in the language of flying, and engineers must be able to discuss engineering in the language of engineers.

In the end, the focus lead to observe students needs regarding the materials specially designed for vocational students of informatics engineering will be highly specialized to the context of the major, highlighting the important distinctions between materials used in other majors and understanding what is crucial for vocational students of informatics engineering in vocabulary learning in the modern era. Therefore, more discussion of this preliminary study is needed to create and construct unique learning media-based technologies for the intended pupils that qualify for future demands.

RESEARCH METHOD

Research Design

The research design of this study attributed to The 4D (Define, Design, Develop, and Disseminate) model developmental study by S. Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel in 1974. The initial stage involves gathering information, which can be accomplished through various methods such as library research and direct classroom observation. Following this, the second stage focuses on identifying learning objectives. Subsequently, the third stage entails the initial development of the product. Moving forward, the fourth stage involves conducting initial field testing or disseminating. Various instruments like questionnaires, interview guidelines, and observation sheets may be necessary to facilitate this stage. This research is limited to focus on a need analysis, in other words, it is defining what specified learning materials needed by students in vocational high school, which lead to the implementation of english for specific purposes.

Participants

This study involved all students of the tenth, eleventh, and twelfth graders of Informatics Engineering in a private vocational school in Jakarta, which had 48 students. They were engaged as sources of information related to their perceptions of ESP teaching so that the basis for developing and improving the quality of ESP

teaching materials could be obtained. All the 48 students involved were the total students.

Table 1. Information about the target students

Program		Ages (years old)				Sex		Total Students
Multimedia / Visual Communication Design	Computer Engineering	15	16	17	18	Male	Female	48
26	22	13	15	15	15	11	37	

Research Instrument

The researcher developed the questionnaire for Need Analysis and has received validation from two linguists and experts in education. The instruments developed to gain information about learning objectives and learners' wants, learning targets, and needs were formulated based on the related literature. Thus, the instruments were based on what experts in developmental studies discussed regarding need analysis. The instrument used is provided in Table 2.

Table 2. Research Instrument

No.	Aspects	Specification	Items
1.	Learning objectives	The goal of vocabulary acquisitions	To be able to understand the core English skills (reading, listening, speaking, and writing)
			To be ready for work
			To be ready to study
			To Communicate in English oral and written
			To understand receptive skills (reading and listening)
		The importance of knowing informatics engineering vocabularies	Understanding various words related to engineering
			Having a more deep understanding of the program study
			Getting along with informatics engineering & technology development
			Avoiding lack of vocabulary when working in informatics & engineering fields
2.	Learners' needs	The necessities in mastering informatics engineering vocabulary	Understanding the meaning of the technical term
			Understanding the vocabulary of technical stuff
			Improving the knowledge about word pronunciation of technical vocabulary
			Connecting the vocabulary to specific subjects in the program of informatics engineering
			Using the specific vocabulary in the practice
3.	Learners' lack	General	My current vocabulary mastery is low
			I frequently make mistakes in pronouncing words
		Specific	I know much vocabulary of informatics engineering
			I'm able to use vocabulary in communication-related to informatics engineering
			I'm difficult to memorize words related to informatics engineering
4.	Learners' wants or interest	Preferred materials design for informatics engineering students	Featured with IT advantages (Augmented Reality)
			Materials with multimedia (moving images & texts) based media

	by technological features	Materials featured with 2D pictures
		Materials featured with 3D pictures
	Preferred materials for informatics engineering students by media	E-Dictionary
		Printed dictionary
	Preferred materials for informatics engineering students by size	Big (Module size) 
		Medium 
		Small (Pocket size) 
	Preferred materials for informatics engineering students by color	I like a colorful dictionary
		I like the dictionary which is monochrome (black and white)
	Preferred materials for informatics engineering students by function	Materials that encourage motivation to enrich vocabulary
		Materials that have a user-friendly function
		Materials that have enchanting design
	Preferred materials for informatics engineering students by arrangement	Materials ordered by themes (thematic)
		Materials ordered by themes (alphabetic
	Preferred lexical contents in the materials	Synonyms
		Phonetics Transcription
		Syllables count
		Bilingual definitions
		Class of words
		The example of words usage
	The preferred topics of the English materials	Parts of computer
		Equipment in informatics engineering
		Technical terms in engineering
		Futuristics technology
		Technology in the old era
		Items based on the function
		Activities in informatics engineering

Data Collection & Analysis

This study is a qualitative research with descriptive data analysis techniques. A qualitative research is social scientific research focused on people, their vital facts, beliefs, opinions, attitudes, motivations, and behavior (Mathiyazhagan, T., 2010). In addition, survey research is suitable for the objectives of the analysis, such as to characterize what is typical in a voter group; the descriptive technique does not provide treatment, manipulation, or alteration in the variables studied but describes an actual condition. Therefore, it was applied in this study. The data was collected through paper-based questionnaire distributions with a Likert scale range of 1 to 4.

The subjective needs analysis in this research focused on the learners' needs, wants, lacks, and target learning. The school offers two types of program studies: computer engineering and network and multimedia. The school was chosen because of the technology used in the teaching and learning processes, assuming that the students represent the millennial generation, also known as the 21st-century generation. They are more interested and open to learning with instructional media integrated with technology.

RESULTS AND DISCUSSIONS

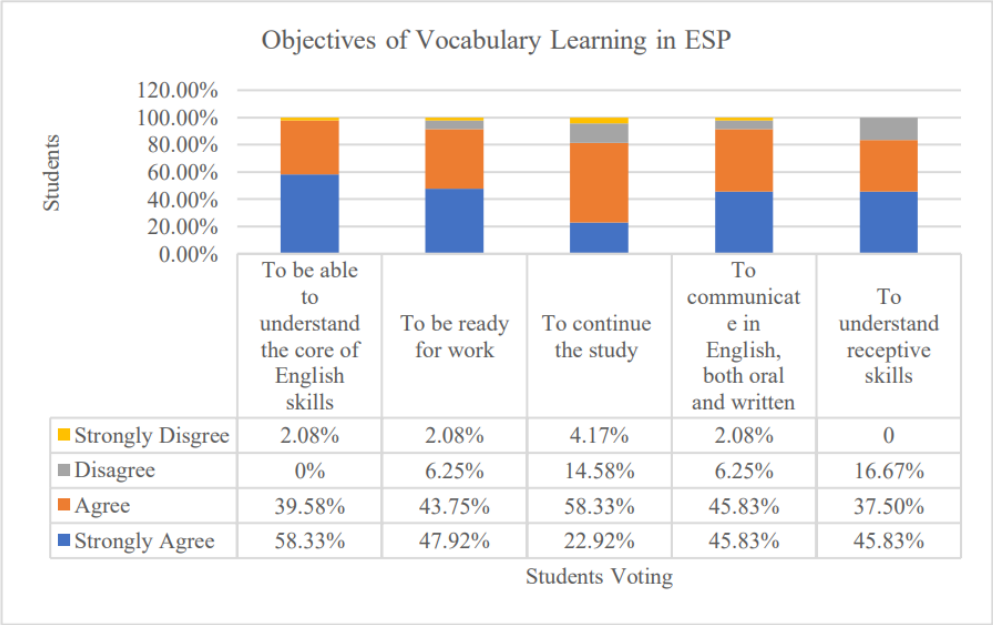
Results

The result was reached by distributing a questionnaire developed by the researcher and authorized by an expert to the intended audience. The instrument that produces the need analysis result concerns learning objectives, students' deficiencies, preferences, target learning, and students' necessity in learning English in their primary (informatics engineering), particularly in learning particular vocabulary and in greater detail on their field of focus. The results of the requirements analysis will also assist the researcher in creating vocabulary-related learning resources for the pupils. Thus, the finished product will be a language set tailored to the domains of informatics engineering.

In this study of students majoring in informatics engineering at a vocational high school, some important conclusions about their English language development have emerged.

a) Learning Objectives

The results of the questionnaire showed that communication Skills 58.33% of students perceive the primary objective of learning English, especially English for Specific Purposes (ESP); the students realized it is important to have the ability to communicate in English to participate in the global community. Acquiring vocabulary is essential for various language skills. Most students perceive that recognizing that the vocabulary learned prepares them for future careers, either directly entering the workforce or continuing higher education for better opportunities, as shown in Figure 1.

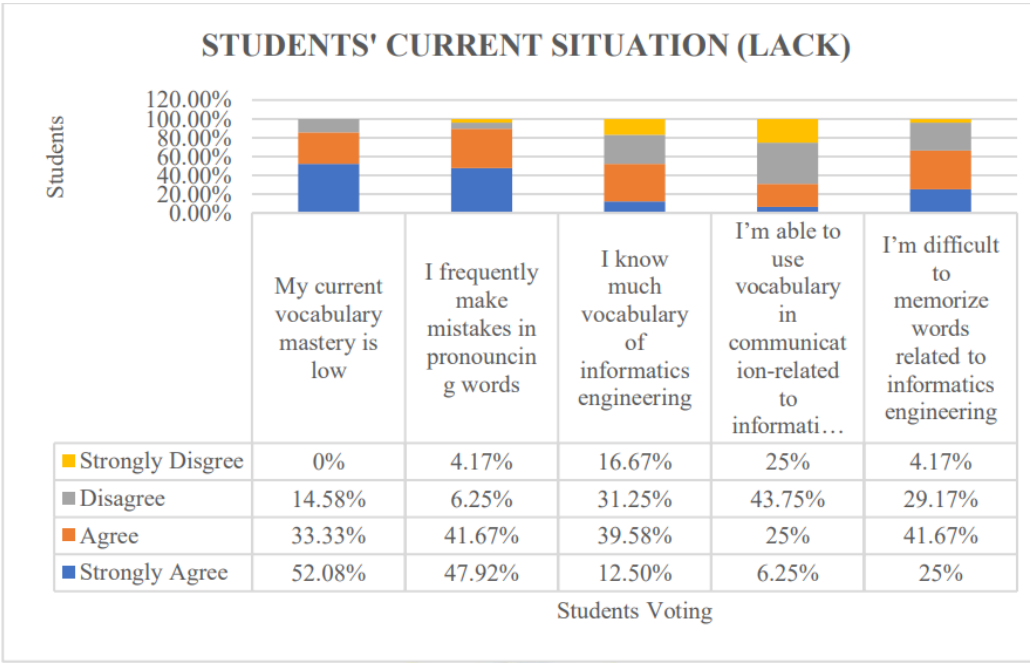


	To be able to understand the core of English skills	To be ready for work	To continue the study	To communicate in English, both oral and written	To understand receptive skills
Strongly Disgree	2.08%	2.08%	4.17%	2.08%	0
Disagree	0%	6.25%	14.58%	6.25%	16.67%
Agree	39.58%	43.75%	58.33%	45.83%	37.50%
Strongly Agree	58.33%	47.92%	22.92%	45.83%	45.83%

Figure 1. Students' Objective in Learning Vocabulary

b) Students Lack Vocabulary Mastery

Most students (52.08%) perceived that they have minimal to little vocabulary mastery in English, mainly related to Informatics Engineering. They also face challenges, such as students struggling with English word pronunciation, which impacts their communication ability, as shown in Figure 2.



	My current vocabulary mastery is low	I frequently make mistakes in pronouncing words	I know much vocabulary of informatics engineering	I'm able to use vocabulary in communication-related to informati…	I'm difficult to memorize words related to informatics engineering
Strongly Disgree	0%	4.17%	16.67%	25%	4.17%
Disagree	14.58%	6.25%	31.25%	43.75%	29.17%
Agree	33.33%	41.67%	39.58%	25%	41.67%
Strongly Agree	52.08%	47.92%	12.50%	6.25%	25%

Figure 2. Students' Current Lack of vocabulary

c) Students Need of Technical Vocabulary

Most students as much as 68.75% emphasize mastering technical terms related to Informatics Engineering in English. Correct Pronunciation: 72.92% of students express the need for correct pronunciation of technical words. Practical Vocabulary: 77.08% of students agree on learning helpful vocabulary in the workplace.

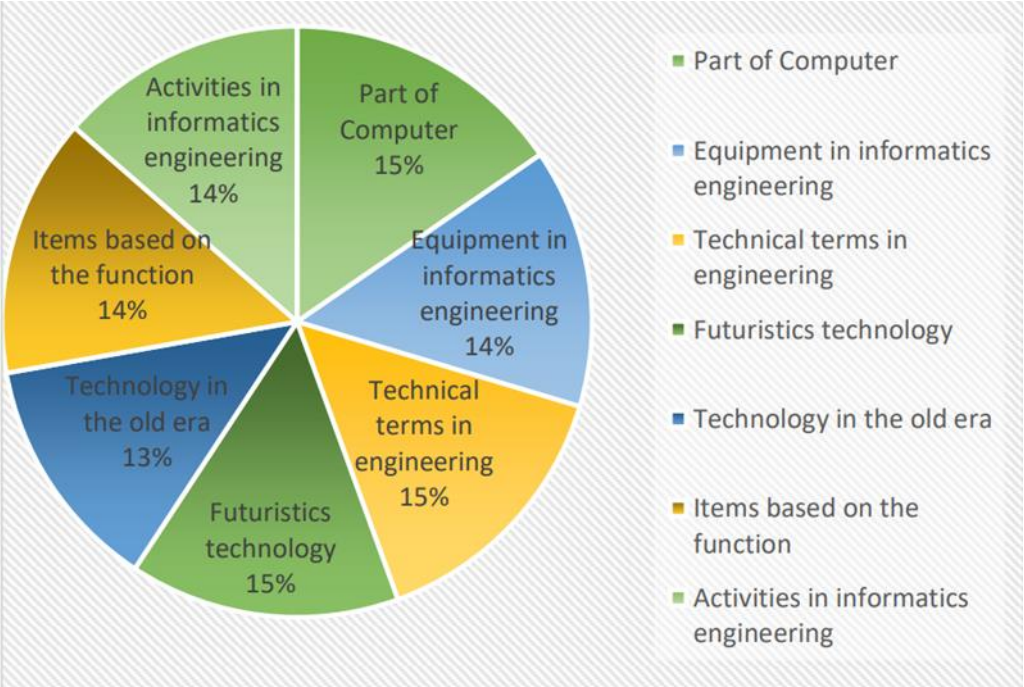
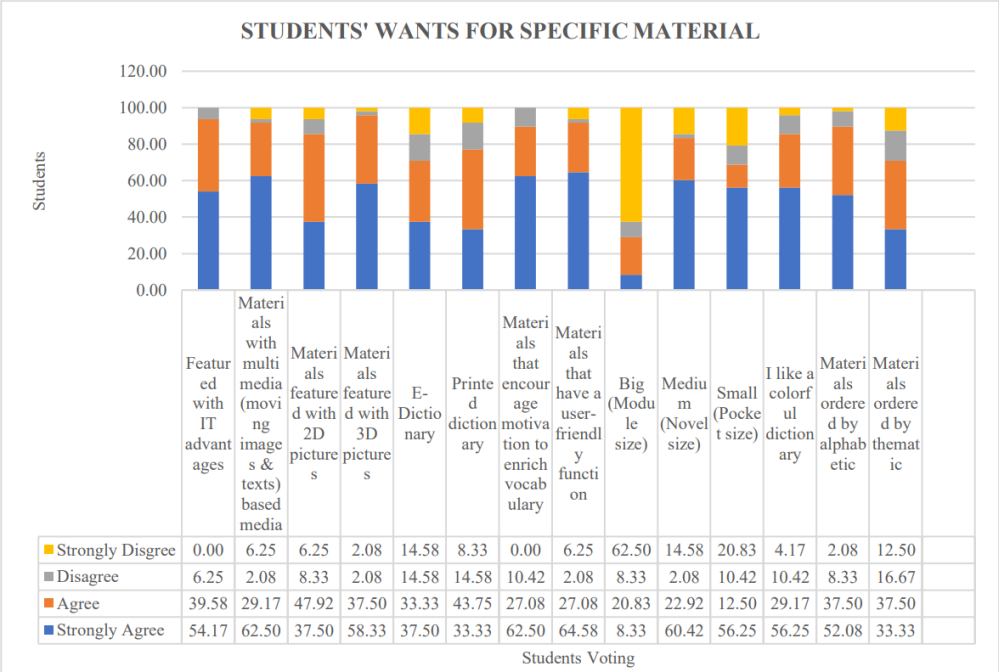


Figure 3. Results of Students' Needs regarding Technical Vocabulary

d) Students' Wants Multimedia Integration

Most 89.58% of students, agreed to prefer learning with additional materials integrated with IT advantages, and 62.50% appreciate multimedia design in learning materials. Dictionary Preferences: Students show varying preferences for dictionary formats, with some preferring electronic dictionaries and others favoring printed or colorful dictionaries.

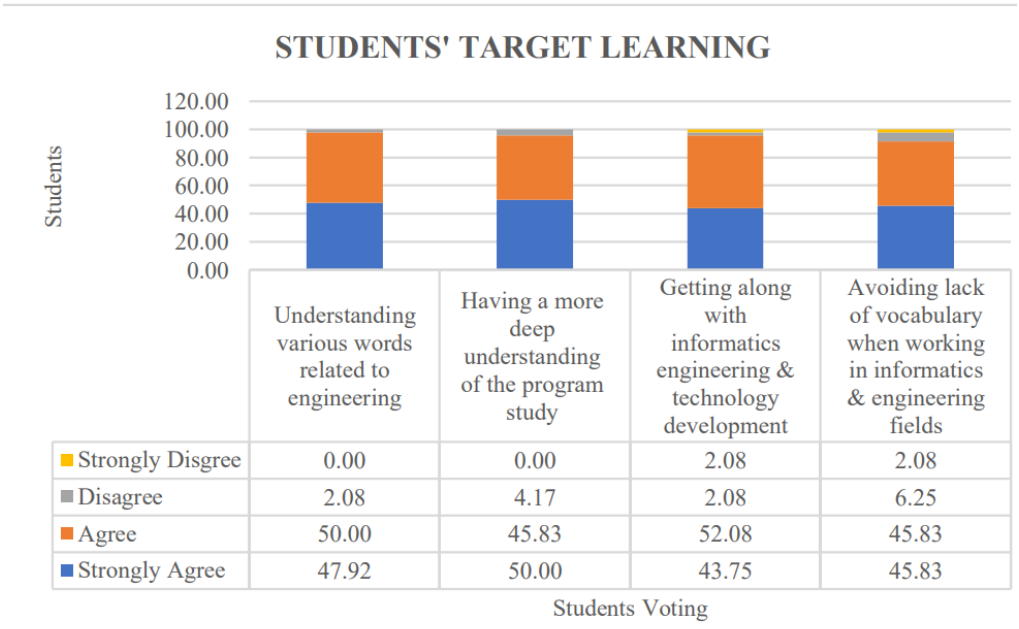


	Featured with IT advantages	Materials with multimedia (moving images & texts) based media	Materials featured with 2D pictures	Materials featured with 3D pictures	E-Dictionary	Printed dictionary	Materials that encourage motivation to enrich vocabulary	Materials that have a user-friendly function	Big (Module size)	Medium (Novel size)	Small (Pocket size)	I like a colorful dictionary	Materials ordered by alphabetic	Materials ordered by thematic
Strongly Disgree	0.00	6.25	6.25	2.08	14.58	8.33	0.00	6.25	62.50	14.58	20.83	4.17	2.08	12.50
Disagree	6.25	2.08	8.33	2.08	14.58	14.58	10.42	2.08	8.33	2.08	10.42	10.42	8.33	16.67
Agree	39.58	29.17	47.92	37.50	33.33	43.75	27.08	27.08	20.83	22.92	12.50	29.17	37.50	37.50
Strongly Agree	54.17	62.50	37.50	58.33	37.50	33.33	62.50	64.58	8.33	60.42	56.25	56.25	52.08	33.33

Figure 4. Results of Students' Wants of Specific Material

e) Students Target Learning

Students aim to grasp various technical terms (97.92%), deepen their understanding of the program study (95.83%), communicate effectively in their field (93.75%), and avoid vocabulary shortages related to Informatics Engineering (91.67%).



	Understanding various words related to engineering	Having a more deep understanding of the program study	Getting along with informatics engineering & technology development	Avoiding lack of vocabulary when working in informatics & engineering fields
Strongly Disgree	0.00	0.00	2.08	2.08
Disagree	2.08	4.17	2.08	6.25
Agree	50.00	45.83	52.08	45.83
Strongly Agree	47.92	50.00	43.75	45.83

Figure 5. Results of Students' Target Learning

f) Language Input Preferences

Students prefer synonyms (79.17%), phonetic transcriptions (87.50%), syllable count (89.58%), bilingual definitions (87.50%), and classifications of words (95.83%) in their language learning materials.

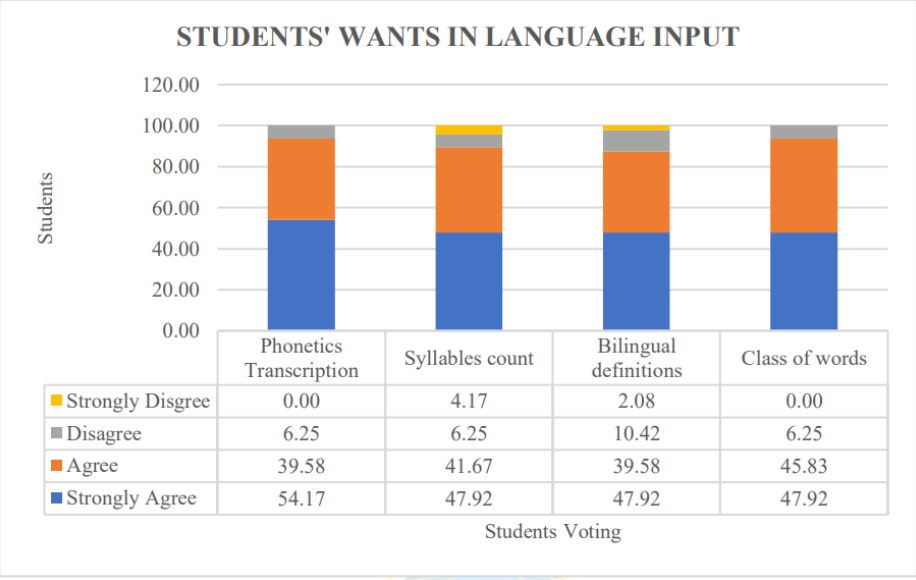


Figure 6. Results of Students' Wants of Language Input

These results underscore the students' desire to develop English language skills tailored to their field, emphasizing technical vocabulary acquisition, correct pronunciation, and practical usage. Additionally, multimedia integration and diverse dictionary options enhance their engagement and learning experience. The study highlights the importance of addressing these specific needs and preferences when designing English language materials for students in Informatics Engineering. The Summary of the results visualize in the figure 7. below.

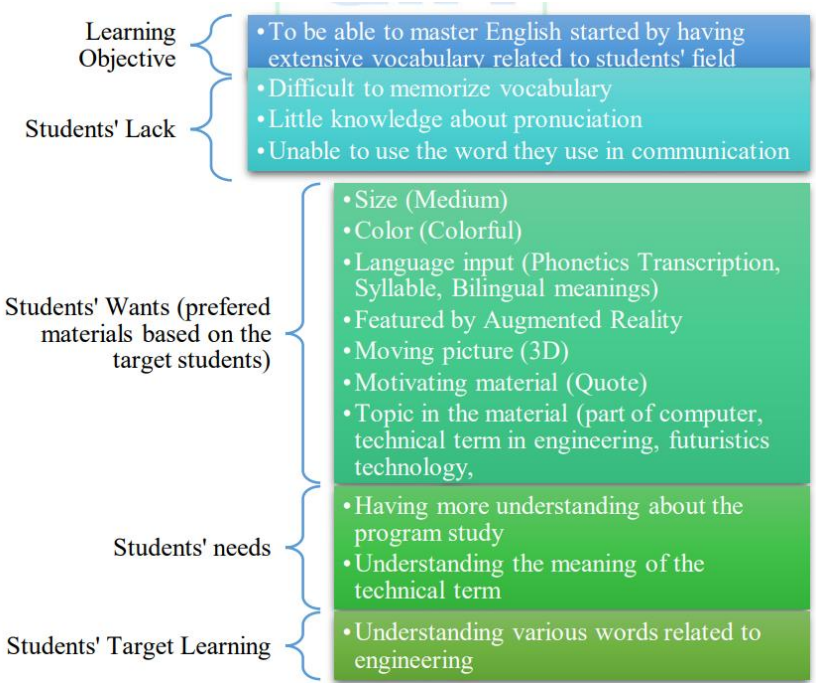


Figure 7. Summary of the Results

Discussions

Based on the explanation of the results related to each aspect of the need analysis, it is necessary to elaborate on those aspects more comprehensively to solve the problem of what the vocational students of informatics engineering need supplementary material. Discussion of learning English in Vocational High Schools cannot be separated from the concept of English for a specific purpose, initially initiated in 1945 due to the Second World War effect (Hutchinson & Waters, 1987). Further, Hutchinson & Waters said that the impact of the Second World War at that time created awareness of the importance of expansion in science, technology, mining, the economy, and trade on an international scale (Hutchinson & Waters, 1987). Activities carried out globally then raise the demand for international language as a communication medium between the people involved. So many mass people started learning English with specific goals during that period.

Since 1960, English has been a primary need for broader world market surveillance(Belcher, 2009) (Hutchinson & Waters, 1987). The concept of ESP continues to develop until now in the 21st century due to the present society requiring ESP to strengthen the needs of the generation skills (Suharno et al., 2020). These include foreign language, adaptability, flexibility, drive for social and cultural diversity, responsibility and efficiency, authority and obligation, decisive reasoning and critical thinking, correspondence, coordinated effort, imagination, and media and ICT skills (Karmi, 2018).

The development of ESP has given rise to various types of learning materials as well as media and methodology specifically designed to suit the needs of the era, as well as the needs of the language learners themselves and the goals to be achieved (Dudley-Evans & John, 2012) (Hutchinson & Waters, 1987). As (Nazarova, 1996) points out, ESP instruction in the past was restricted to simple training and

translating texts. Those monotonous learning methods are no longer suitable for students in the digital era. Since the ICT forms of learning media have intervened in their daily activities in and out of the classroom (Maulidya et al., 2021), Implementing an old approach led to inadequate engagement in the learning activity and low learner motivation (Fernández & Vallejo, 2021)

Moreover, the lack of ESP courses and specialized materials may also cause high unemployment (Bracaj, 2014) and poor quality of student language skills, which causes low productivity later when they use English in their future profession(Negova & Umarova, 2022). Therefore, teachers or practitioners need to find the appropriate material for the target students.

It is related to the current English needs of vocational students with a work-oriented objective of learning English inhe specific program (Samani, 2018). Furthermore, in many cases in the vocational school area, general English is taught in the classroom instead of typical English, which causes various language skills' lack and other problems such as those mentioned above. It is challenging and needs considerable effort to change general English into specific English due to the national curriculum set that is implemented in the school. Therefore, supplementary material that supports the lack of students' English skills is mainly needed to bridge the gap (Muhammadolimovna, 2022).

Referring to the results, the informatics engineering students in Indonesia, particularly in that school, have low English proficiency in general, such as an inability to use English in communication activity, frequent pronunciation mistakes, and little knowledge of English in terms of Informatics Engineering. Therefore, the researcher aimed to create the appropriate supplementary material for them. As pointed out, English is still a key contributing element of employment to meet the needs and requirements of most companies and organizations in hiring employees; this endeavor will lead to fulfilling the future needs of vocational school students (Amin & Bakar, 2022).

The same framework was also found for solving an apparent problem in Indonesian vocational schools. The research conducted by (Cahyaningrum & Wagiran, 2019) developed relevant models and approaches to developing vocational schools in Indonesia because of the urgency that requires the labor industry to sustain the development of the growing economy of a country. Since the current state of vocational schools has not been well developed in regional cases and to produce productive, competent, and professional human resources, the development with a basic regional approach was conducted. Additionally, the development of vocational schools and education in Indonesia needs more research focused on the problems and then created significant implications for the country's development, as done by (Cahyaningrum & Wagiran, 2019)

Specific qualifications also cause the lack of learning resources in vocational areas since the materials accepted for vocational students should align with the current curriculum implemented, which is arranged based on the needs of the working environment (Kemdikbud RI, 2020)(Kemdikbud RI, 2021) based on Perdirjen Dikdasmen No. 06/D.D5/KK/2018 dated June 7 the year 2018. Further, those needs are designed to refer to the structure of the spectrum and lesson plan (RPP) of productive subjects in the vocational program to set the measured learning

objectives. This procedure makes the material being developed very specific to the context and challenging for language development in ESP. It can be concluded from the above discussion that the material for vocational students in the Informatics Engineering program should be designed, besides fulfilling students' needs while learning English, also objected to fulfilling the demands of the working world demands.

It is in line with Hutchinson and Waters that there are two classifications of a need, and they are target needs (what the learner needs to do in the target situation) and learning needs (what the learner needs to do to learn) [28]. These relatable notions are crucial to meet the demands of the world of work and can be used as the ultimate goal of the output that students do, or they can be called a target situation. Thus, the analogy of those needs can be drawn as an equilateral triangle, which shows that these three aspects are interrelated and dependent on each other (the target situation (demand of the working world), target needs, and learning needs). To assist students reach their full potential in terms of their English, it is essential to provide them with challenging, appropriate, and current courses (Girgin et al., 2021). To find out the needs of the target participants specifically and broadly, state the elements that must be found about learners or target participants, namely, lack, necessities, and wants. Those elements may all involve some comparison or reference to list items that can act as the course's learning goals (Hutchinson & Waters, 1987).

In the context of this research, the participants are from a private vocational school in West Jakarta. The school only accepts a limited number of students because of the quality of its students. The students enrolled in this school are 77% male (N=48, F=11, M=37), and the rest, as much as 23%, are girls. Besides gender differences between men and women, majors are Computer Engineering and Multimedia. The students also varied in age distribution, ranging from 15 to 20. This also means differences exist in affective, cognitive, and personality-related individual differences (Gardner R. C., 1987). Some overlaps, such as motivation, language learning anxiety, and self-confidence, are generally listed among affective factors.

Furthermore, (Kormos & Sáfár, 2008) argued, in contrast, personality-related differences comprise traits such as openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability have an impact on memory they have in the process of language learning, especially foreign language learning for some people is a relatively unique experience as argued by To deal with students aged 15, 16, 17, 18, 19, and 20, the researcher or language developer can develop their learning motivation, as engaging students' motivations is linked with the language learning process. Moreover, (Gardner R. C. 1987) (1987, p.10) stated that motivation means the combination of efforts plus the desire to learn the language and the satisfaction experienced in the learning activities. Senior high school or equal students in the current era use technology to access social media in their daily activities, school tasks, and personal lives (Maulidya et al., 2021), as well as stated. Technology can support pedagogies that focus learners in collaborative online and offline learning environments (Masterson, 2020)—emphasized the importance of digital technologies in education, such as enhancing

many learning opportunities and allowing for student comfort (Marcus-Quinn & Hourigan, 2022). It can potentially affect students' fine motor development and problem-solving skills, help student willingness and engagement, and allow for learning enhancements to help them succeed. The most important one is to motivate students in their education (Carstens et al., 2021).

The significant impacts of technology in education have also been incorporated into language teaching and learning because it attracts interest among language learners and technology users (Lyu & Qi, 2020). Those fruitful facts mentioned previously are adopted in this research to motivate students of informatics engineering in particular ages and in designing appropriate materials and media for their specific context using the advantages of technology in language learning.

The problems in learning English faced by vocational students of Informatics Engineering mentioned in the findings of this research reveal. They are about the inability to use English in communication, frequently making mistakes in pronouncing words, and having little knowledge of English in Informatics Engineering. They are solved by developing supplementary materials for vocabulary learning through pocket dictionaries integrated with Augmented Reality technology.

According to (Karman & Indriani, 2021), in language learning, there is a language aspect that has become a core of learning. It is a language component, namely vocabulary, because reciprocal communication requires degrees of language comprehension (Fresneda & Iváñez, 2022). Without knowing the language, language learners could lose essential details, such as necessary information (Karman & Indriani, 2021). Moreover, it also relates the complementary relationship between vocabulary knowledge and language usage by claiming that vocabulary knowledge will enable language use (Nation, 2001).

In addition, Afzal (2019) argued that proficiency in the English language depends on the knowledge of its vocabulary possessed by second and foreign-language learners and even native speakers. Therefore, students with a low vocabulary knowledge show weak performance in language activities such as communication and vice versa. Furthermore, the fact that low vocabulary is one of the effects of problems that students face while learning language, such as problems in word pronunciation and memorization, especially in the process of vocabulary acquisition (Wang et al., 2007). Particular research has stated that pronunciation is an essential English competency, so students who want to improve their English-speaking skills must have proper pronunciation (Suryaleksana et al., 2022). One of the fundamental prerequisites for competency is clear pronunciation, which is also one of the critical components of language training (Aboe & Bahara, 2022). The interlocutor can grasp a speaker's views, ideas, and other things because of their understandable pronunciation or the correct sound of their English words (Pietikäinen, 2018).

In learning English with correct pronunciation, (Suryaleksana et al., 2022) suggested introducing students to the International Phonetics Alphabet (IPA). Learning to read the IPA improved students' pronunciation skills because learning IPA increased students' awareness that different words or letter arrangements

(consonant and vowel) could change reading and pronunciation. Pronunciation is a severe matter for English students since it has much to do with communication. In this respect, by learning the International Phonetics Alphabet (IPA), students can understand how their speech organs, such as vocal cords, tongue, and lips, contribute to producing different sounds (Saletti-cuesta et al., 2020). Therefore, students will have correct pronunciation as well as improve communication quality by having the ability to pronounce the vocabulary correctly(Mei & Masoumeh, 2017).

To sum up, the statements above align with the research finding that the research problems are mainly caused by students' lack of knowledge about English. It means the current state of the student's English skills is related to the lack of vocabulary knowledge, which causes errors in English practice and difficulties in learning English that occurred with the target students, who are students of the Informatics Engineering program in the vocational school.

The lack of vocabulary is a fundamental aspect for language learners that must be resolved immediately after knowing what causes this condition (Alqahtani, 2015). However, this condition does not only happen in students of Informatics Engineering. The same problem in language learning was also found in 2019 about the lack of vocabulary of the students effectively solved by using a pocket dictionary as the medium of learning (Mariah et al., 2019); this strategy is effective in engaging students' motivations to learn English more since the pocket dictionary was successfully built autonomy for the students and also helped students to be more confident using the word they have already known as well as help them to uncover the unknown word.

The other research also showed that most students are rarely interested in using dictionaries (Mariah et al., 2019). On the contrary, they prefer to use Google Translate or translate machines as an online dictionary rather than memorizing words from dictionaries or printed materials(Mariah et al., 2019).

In line with this, it was argued that the preference for using Google Translate would not give the students the appropriate and contextual meaning it is supposed to. Further, this strategy can make students understand the words they seek in machine translation. It can also make students academically dishonest because they can easily make an authorized assignment(Harris, 2010). Students who have low motivation in learning most of them have a low level of self-confidence to express themselves using the vocabulary they have(Yang, 2008). Further, it was also emphasized that the teacher must motivate the learners to reduce their anxiety. However, when learners can talk about the topic they like, they will be more interested in learning a new language using it instead of their native language.

In contrast, some learners are under peer pressure and fear being mocked by classmates whenever they stumble or make mistakes. The research conducted by (Kember et al., 2008)argued that students positively respond to the pertinent, interesting themes or topics in their learning environment, which means that when students are born as digital natives. They are involved in the school's use of information communication and technology (ICT) as primary tools. One of the various ways to enhance their motivation in learning is using ICT itself, since technology is media to solve almost all problems in the 21st century that can be

used beyond space and time (Park & Son, 2020), in line with this, technology has already been used for the educational system as fostering key to 21st-century skills in education which includes creativity, innovation, communication, and collaboration in students (Kee & Samsudin, 2014).

Experts consider ICT to be criticaln modern society due to the scope of digital learning, which includes the enterprise's massive needs, since interactive media has attracted the attention of all circles (Chao & Chang, 2018). ICT is becoming more accessible with mobile devices, which can create flexibility among users. It allows the teaching tools to be extended on mobile phones and game-learning via App, one of which is using Augmented Reality (AR) technology. It was explained that augmented reality (AR) has been widespread in navigation systems, magazine books, and gaming media (Chao & Chang, 2018). It is also rapidly becoming more popular in the classroom for course comprehension.

Moreover, with the capabilities of digital technology, educators may produce supplemental teaching materials that give them a helpful teaching tool and increase student engagement and depth of understanding. Previous researchers have provided proof that AR has been used to improve students' motivation in learning math(Chao & Chang, 2018), helpful in learning physical education(García, 1989) and science (Alakärppä et al., 2017). It has also been proven to be used for engaging English teaching and pedagogy (Raju & Joshith, 2020). The above studies show the significant use of augmented reality in education, supported by (Karki, 2018) that teachers should stimulate creativity. Thus, using supplementary learning resources or selecting materials based on their learners' learning styles and needs to fulfill the needs of the students, they must be careful in considering the lesson's objectives. To sum up, an Augmented Reality technology with a pocket dictionary for vocational students majoring in informatics engineering was claimed appropriate based on students' needs, adjusting their characteristics and the needs of the working field as vocational school students are required to have.

CONCLUSION

In conclusion, this study aims to investigate the needs of vocational students majoring in Informatics Engineering in English vocabulary learning for a specific purpose (ESP) context. The research findings showed that Informatics Engineering students need specific English materials to help them deal more deeply with contextual vocabulary related to their program; therefore, they are ready and well-prepared to face the work field after graduation. The students agreed upon several learning goals associated with Informatics Engineering. First and foremost, a sizeable specific vocabulary is needed in English for communication, and more is to understand the four core English skills and the receptive and productive skills. Furthermore, the benefits they get from learning from developed supplementary materials are that they get to know the visible aspect of the vocabulary because of learning it with a pocket dictionary integrated with augmented reality (AR). It is easier for them to remember the new vocabulary they know. In the future, students who graduate from informatics engineering with skills and knowledge about computing, programming languages and design, and video editing were assumed to primarily use the vocabulary they have both orally and textually in the creative world

of work. However, with the language learning they get using the materials, the students should also improve productive skills to support their vocabulary knowledge by knowing first how to pronounce the vocabulary correctly, which is in line with the government goals, that is, in learning English in vocational school is to be able to communicate in English to prepare them to face the work field. Thus, the data on students' needs for this study was limited to a single vocational school, which may restrict the generalizability of the findings to a broader population of Informatics Engineering students and the material design. This study suggests further research involving broader participants, such as all informatics engineering vocational schools in Indonesia.

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