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**Students' Vocabulary Learning through Augmented Reality (AR):
EFL Student Teachers' Perceptions**

*Persepsi Calon Guru Bahasa Inggris terhadap Pembelajaran Kosakata
melalui Augmented Reality (AR)*

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Abstract

This study explores the integration of Augmented Reality (AR) into English language education, focusing on the topic of professions. Student teachers in a Micro Teaching class were invited to assess the AR-based learning activities designed to aid vocabulary comprehension. Questionnaires were distributed to gather perceptions on the potential usefulness and suitability of the AR product for classroom use. The results affirm that AR holds great promise in enlivening and enriching English language lessons, as student teachers provided numerous creative ideas for its implementation. Valuable recommendations for product improvement were also obtained. As English teachers strive to develop effective teaching media, they should consider how such technology facilitates meaningful learning objectives. This research offers insights into the positive impact of AR in language education and highlights its implications for improving students' language proficiency in specific domains.

Highlights:

- AR integration in English learning: Augmented Reality (AR) offers an innovative approach to enhance English vocabulary learning in the context of professions, fostering greater engagement and interactive classroom experiences.
- Perceptions of student teachers: The study gathers valuable insights from student teachers' perceptions, highlighting their ideas and suggestions for effectively implementing AR-based learning activities in language classrooms.
- Implications for language education: The research underscores the potential of AR as

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a teaching tool, emphasizing its positive impact on language proficiency and the importance of meaningful content to facilitate effective learning outcomes.

Keywords: Augmented Reality (AR), English Vocabulary, Profession, Student Teachers, Learning Activities

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INTRODUCTION

There are many different methods for learning vocabulary. Words can be taught to a pupil directly or they can be taught to them naturally through context. Although certain word meanings are explicitly taught, it "appears to be a crucial component of vocabulary acquisition" to infer word meanings from context [1]. As a result, while employing an AR technique to teach vocabulary, students can also deduce word meanings from context by connecting their new definition to a location in their AR world and receiving direct instruction in new material. By seeing and hearing the words used in context, students using AR will be able to connect new content in a way that suits their way of thinking. The more engaged, anchoring, and connections kids establish with vocabulary words, the longer they can learn and retain new material and then use these terms effectively in academic contexts. Language retention will therefore improve reading comprehension and all-around academic success.

Every student learns in a different way. The information must be delivered in various ways to satisfy every learner's needs. When youngsters are exposed to both words and pictures, according to the Cognitive Theory of Multimodal Learning (CTML), they absorb concepts more deeply [2]. It's been proven that teachers value this theory. Even without using an AR technique, it is crucial for teachers to teach students new information in a variety of ways. For instance, it helps students learn vocabulary when utilizing the traditional flashcard approach to have a written definition, a visual representation, and to hear the description said aloud. This method enables professors to impart knowledge while interacting with various kinds of students. Yet, applying an AR strategy elevates the CTML concept. Students are exposed to written, visual, and auditory information as well as given the opportunity to tie their learning to a gaming scenario, past knowledge, a 3D environment, or a novel visual location or experience in this way. must be delivered in various ways to satisfy every learner's needs. It's been proven that teachers value this theory. Even without using an AR technique, it is crucial for teachers to teach students new information in a variety of ways. For instance, it helps students learn vocabulary when utilizing the traditional flashcard approach to have a written definition, a visual representation, and hearing the description aloud. This method enables professors to impart knowledge while interacting with various kinds of students. Yet, applying an AR strategy elevates the CTML concept. Students are exposed to written, visual, and auditory information as well as given the opportunity to tie their learning to a gaming scenario, past knowledge, a 3D environment, or a novel visual location or experience in this way.

In designing a media product, the inventors need to make sure that it can be used for learning purposes with minimal risk of misunderstanding the concept. To know the eligibility of the product, a lot of inputs from the related users can be considered for improvement. In the context of exploring perceptions of the use of AR, many studies have involved teachers and students in the process of data collection. Very few talks about pre-service teachers' ideas [3]. In the EFL context, pre-service teachers' perception of technology is dominantly involved in mobile-assisted language learning (MALL) [4], pandemic learning [5], [6], online learning [7], and TPACK [8], not specifically talk about Augmented Reality (AR). In the process of becoming teachers, it cannot be denied that during the step in the teacher preparation program, pre-service teachers develop their knowledge and empower their skills for teaching performance. Therefore, they also have their own ideas on content mastery as well as the quality of the media. In this study, the researchers have shared the product of AR for the profession with the EFL pre-service teachers to explore their critical ideas in seeing the product of AR for the Profession as the tryout on a small scale before it is used in public.

What are the EFL student teachers' perceptions towards the use of AR in EYL vocabulary learning?

METHOD

This study applied a qualitative approach. The survey design was implemented for the EFL pre-service teachers who take English for Young Learners courses in semester 6. There are twenty-two teacher candidates consisting of five males and seventeen females. This purposeful sampling was done since the subject has learned the theory and practice of how to prepare materials, exercise, and media to instruct young learners. Furthermore, they have been prepared to do a practicum in a real school to apply their lesson plan. After distributing the questionnaire which covers content and product aspects, the subjects agreed to join and finally were involved as participants.

No	Question	Aspect	Number
1	Product	Suitability Clarity Balance Shape Color	12345
2	Content	Accuracy	6

Table 1. Aspects of Perceptions of the AR

To collect the data, pre-service teachers were given the markerless based-AR application and they assessed the product based on simplicity, integration, clarity, balance, shape, and color. Meanwhile, for the content, they focused on the accuracy of the English words. In addition, they were also asked to write comments on the strengths, recommendations, and the most difficult and easiest profession to be used for learning English

vocabulary. The response was then analyzed in two ways: using percentages for close-ended questions and manual coding for open-ended questionnaires to perform thematic analysis.

RESULTS AND DISCUSSION

There are two results of the student teachers' perception regarding their type of responses on the questionnaire, namely, open and close-ended questionnaires. In the close-ended, pre-service teachers state that the product of AR is eligible to be used for teaching young learners. Most of them selected yes to the option of media quality. This means that they get a positive experience when they tried to use the product. At that time, they pretended themselves as the young learners and learned English by using AR. The perception also indicates that they like the AR performance since they can directly install it on Android devices so that they can operate the system whenever they are. This refers to the practicality where the users do not need to take a long time to enjoy the performance of AR on their smartphone. Android has many users in this world; thus, this product is beneficial for everyone, particularly students. To know the details of their perception can be illustrated in Figure 1.

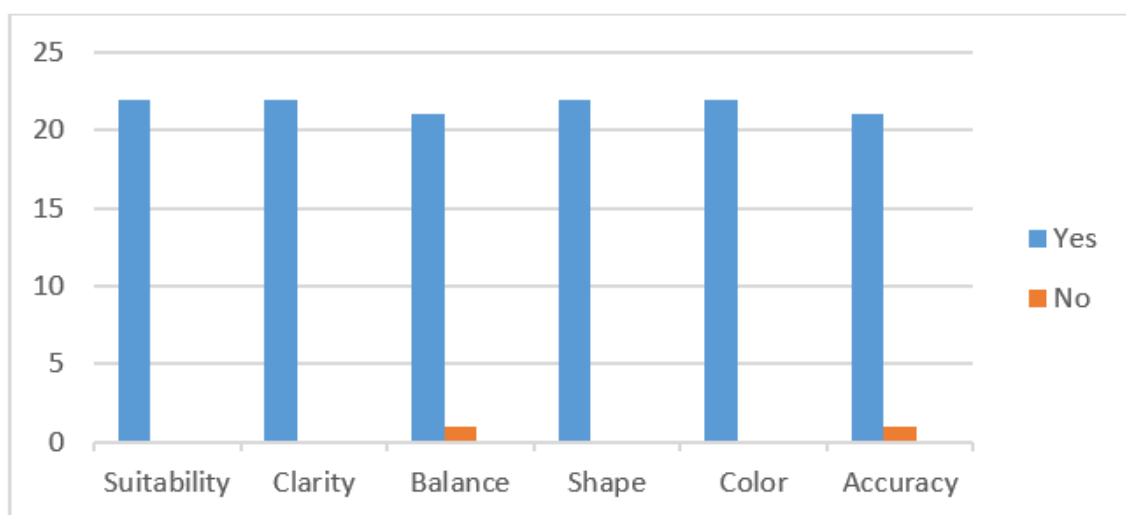


Figure 1. The perception of AR for the profession

In Figure 1, it can be identified that in the aspect of balance and accuracy, 1 participant selected option No for the quality of the product. Balance here means the composition of the product is proportional, while accuracy refers to the correct spelling of the words of English. By looking at this feedback, it can be used for reflection and improvement for better results.

As a response to the negative answer, this study would like to give the opportunity to the pre-service teachers to clarify their opinions in a written way to make it clear. the responses on the limitation of the product based on their perception are described in Table 1.

No	Limitations	Aspects
1	The problem is on the device. Most of the young learners do not have their own cell phones.	Device
2	Quality of the pictures in the AR.	Quality Performance
3	The balance in displaying the animation needs improvement.	Quality Performance
4	The display is sometimes difficult to be placed.	Quality Performance
5	The characters need to be added so that students have many inputs to learn English vocabulary.	Quantity
6	The brightness needs to be improved to make the characters more interesting.	Quality Performance
7	Some characters' profession is	Suitability

	difficult to be identified.	
8	It is costly to use AR in the class. The students have to bring their devices.	Device
9	In addition to the high price, when using AR, privacy is not always safe.	Cybercrime
10	Inconsistency in terms of size	Quality Performance
11	It's already good although the attribute is not contextual.	Quality Performance
12	The motion in the media needs improvement based on the profession.	Quality Performance
13	The AR needs more relevant objects to support the profession.	Quality Performance
14	Technology addiction for students.	Psychological impact
15	AR is interesting, but the negative effect on students is that they are lazier since what they see is not something real.	Negative attitude

Table 2. *The perception of the Limitation*

Based on the information in Table 1, the limitation of the products deals with nine aspects, namely the availability of the device, performance quality, quantity, suitability, cybercrime, psychological impact, and negative attitude.

No	Recommendations	Aspects
1	The AR needs more motions to make it more interesting for students.	Performance Quality
2	Before implementing the AR, students have to be introduced to the topic of the profession. It can be done by showing through PPT slides or smartphones. Better it has automatic movement to make it more alive.	Pedagogical Aspect
3	Give some clues for the students	Performance Quality
4	It needs background sound or music for attracting students' interest	Performance Quality
5	Background can be added to the animation	Performance Quality
6	It needs details of the supporting tool in each profession	Performance Quality
7	Movement and sound are very important to support the use of AR	Performance Quality
8	It needs up-to-date content	Performance Quality
9	When using AR the students need the teacher's guidance	Pedagogical Aspect
10	It can be improved by adding the feature of talking AR when we say English vocabulary.	Performance Quality

Table 3. *The Perception of the Improvement*

From the result in Table 2, it can be identified that pre-service teachers put their focus on performance quality. This is important to be concerned about since the media will be used to teach young learners who are attracted easily to the media's first look when learning. It is believed that the more interesting the media the more motivated the students to comprehend the lesson.

No	Profession	Easy for identification	Difficult for identification
1	Teacher	Participant 2,3,6,8,9,12	Participant 1, 5, 13
2	Astronaut	Participant 3,4,6,10	Participant 2, 7, 9, 15, 16, 17, 19
3	Chef	Participant 13	No participant

4	Doctor	Participant 1,2,3,5,8,11,14	No participant
5	Nurse	Participant 18, 21, 22	No participant
6	Pilot	Participant 7	Participant 3, 9, 10
7	Police	Participant 5, 6, 9, 15	No participant
8	Farmer	No participant	No participant
9	Fisherman	Participant 20	No participant
10	Firefighter	Participant 20	No participant
11	Soldier	No participant	Participant 21

Table 4. Perception of the identification of profession

Dealing with the level of difficulty in determining the profession based on the performance in AR, many professions are identified as easy, while some of them are difficult. The dominant response for the easily identified character on the doctor and teacher. Nevertheless, the most difficult one is on Astronaut.

Based on the findings, the pre-service teachers have given insightful feedback for the quality improvement of the AR for profession. They express their perception based on what they have learned and experienced in classroom activities. The findings show that positive responses received are emphasized the performance quality. This point is beneficial to see how attractive the media is when it is given to young learners. The attractiveness of media is one of the pivotal elements to contribute to the enjoyment as well as motivation for elementary school students [9]. Furthermore, in the education, tourism, and medicine context, the consumers of AR consider their adoption based on the attractiveness of the media [10]. More complete from the previous argument, Pribeanu et al., confirm that in checking the perceived quality of AR, users see the usability, usefulness, and enjoyment. In line with this, this study has asked the participants to assess the product in terms of suitability for usability, clarity, balance, shape, color as the enjoyment, and Accuracy as the usefulness [11].

The perception of the limitation of the AR encourages the researchers to make revisions for the eligibility of media. One of the points of concern relies on device availability. This is very crucial for classroom activities supported by AR. At least the teacher brings the supporting tool to operate the application. Talking about technology, this is in line with some studies exploring the discrepancies in teacher and student conditions. It becomes a challenge for the implementation. This also includes the location which is limited for Internet access [12] [13] such as in developing countries [14]. The next is related to quality performance. It has a great contribution to the optimum implementation. As mentioned in studies related to quality assessment of AR for its better user experience [15] [16]. In response to the psychological impact, it is believed that using AR makes users get addicted to technology or their gadgets. In this case, it can be a positive experience for students if there is a monitor from parents and teachers [17] [18].

Related to the media assessment of profession identification based on the pre-service teachers, it is found that the profession of Astronaut Pilot, and Teacher needs to be improved for the attributes of the characters. This part supports the importance of performance quality for learning [19]. This is to avoid confusion for students, especially young learners who are learning concrete things. Authenticity is really important to be delivered when AR is used by teachers in giving materials [20].

CONCLUSION

This study shows that the use of AR for the profession is generally acceptable to be applied from the view of EFL pre-service teachers. Nevertheless, it needs some improvement in terms of performance quality to make a better product of AR and create interactive classroom activities for the student's meaningful learning process.

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