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## Needs Analysis of Development Immersive Technology In Microteaching Practices

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### Abstract

*Microteaching, as a core component in teacher education, plays an essential role in preparing prospective teachers to develop professional teaching competencies. However, in the Educational Technology Study Program at FKIP Palangka Raya University, immersive-based learning media such as Augmented Reality (AR) have not yet been applied. This study aims to conduct a needs analysis to examine the feasibility and potential of AR in microteaching practice. Data were collected through questionnaires, observations, and interviews involving 60 students and 9 educators. Quantitative data were analyzed using percentage formulas, while qualitative data from interviews were thematically interpreted to capture educators' perspectives. The findings show that 75% of educators considered the use of AR in microteaching very important, while 53.8% of students rated it as important. Interviews further revealed that AR is perceived as an engaging medium to enrich learning experiences, although financial limitations remain a major challenge. Despite these constraints, both educators and students demonstrated strong interest in adopting AR to make microteaching more interactive, enjoyable, and effective in enhancing cognitive abilities and learning outcomes. This study highlights the importance of needs analysis as a foundation for developing AR-based learning media in microteaching and provides insights for future design and implementation in teacher education programs.*

*Keywords: Immersive Technology, Augmented Reality, Microteaching, Needs Analysis, Teacher Education*

### Abstrak

Microteaching, sebagai komponen inti dalam pendidikan guru, berperan penting dalam mempersiapkan calon guru untuk mengembangkan kompetensi mengajar profesional. Namun, di Program Studi Teknologi Pendidikan FKIP Universitas Palangka Raya, media pembelajaran berbasis imersif seperti Augmented Reality (AR) belum diterapkan. Penelitian ini bertujuan untuk melakukan analisis kebutuhan guna mengkaji kelayakan dan potensi AR dalam praktik microteaching. Data dikumpulkan melalui kuesioner, observasi, dan wawancara yang melibatkan 60 mahasiswa dan 9 pendidik. Data kuantitatif dianalisis menggunakan rumus persentase, sedangkan data kualitatif dari wawancara diinterpretasikan secara tematik untuk menangkap perspektif pendidik. Temuan penelitian menunjukkan bahwa 75% pendidik menganggap penggunaan AR dalam microteaching sangat penting, sementara 53,8% mahasiswa menganggapnya penting. Wawancara lebih lanjut mengungkapkan bahwa AR dianggap sebagai media yang menarik untuk memperkaya pengalaman belajar, meskipun keterbatasan finansial tetap menjadi tantangan utama. Meskipun terdapat kendala-kendala ini, baik pendidik maupun siswa menunjukkan minat yang kuat dalam mengadopsi AR untuk menjadikan pembelajaran mikro lebih interaktif, menyenangkan, dan efektif dalam meningkatkan kemampuan kognitif dan hasil belajar. Studi ini menyoroti pentingnya analisis kebutuhan sebagai dasar pengembangan media pembelajaran berbasis AR dalam pembelajaran mikro dan memberikan wawasan untuk desain dan implementasi di masa mendatang dalam program pendidikan guru.

Kata Kunci: Teknologi Imersif, Realitas Tertambah, Pembelajaran Mikro, Analisis Kebutuhan, Pendidikan Guru



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## Introduction

In the current digital era, educators must be able to innovate in the utilization of digital technology in the learning process. Ratten, V. (2023) Educators must continue to experiment with technology and implement new digital technologies to encourage students to utilize technology and display new learning methods. Serdyukov, P. (2017) the need for educational innovation has become acute, education as a social institution serving the needs of the community, is not only necessary to be comprehensive, sustainable, and outstanding, but must continue to develop to meet the rapidly changing and unpredictable challenges of the globalized world.

Most learning is taught face-to-face and through direct interaction between educators and students, therefore educators can innovate by implementing technology, one of which is immersive learning technology. Lee, Y. C. N., et. al. (2013) Immersive technology is technology that blurs the boundaries between the physical and virtual worlds and allows users to experience deeper experiences. Immersive technologies include virtual reality (VR), augmented reality (AR), mixed reality (MR), and holography. Chang, H. Y., et al. (2022) Tang, Y. M., et. al. (2022) Immersive technology can enhance students' learning experiences and encourage their collaboration and creativity in the classroom.

AR as allowing real and virtual objects to coexist in the same space and be interacted with in real-time. Sarpong, D., Boakye, et.al. (2022) AR in terms of merging, collaboration, and interaction between real and virtual elements. Therefore, object recognition and visualization, synergy between formal and informal settings, and real-time support emerge as potential benefits. The augmented reality (AR) technologies in immersive learning will continue to develop as part of the lives of individuals and communities as an adequate solution to help meet educational needs, including in the Technology Education Study Program at FKIP Palangka Raya University.

As a study program with one of its learning outcomes being a professional teacher, the microteaching course is very important in shaping and developing basic teaching competencies as preparation for teaching practice in schools/educational institutions in order to face full-time teaching jobs in front of the classroom with knowledge, skills, abilities, and attitudes. In microteaching practice at the Technology Education Study Program at FKIP Palangka Raya University, there is still a lack of implementation of technology to support this, therefore, an

innovative learning approach is needed that can maximize microteaching practice.

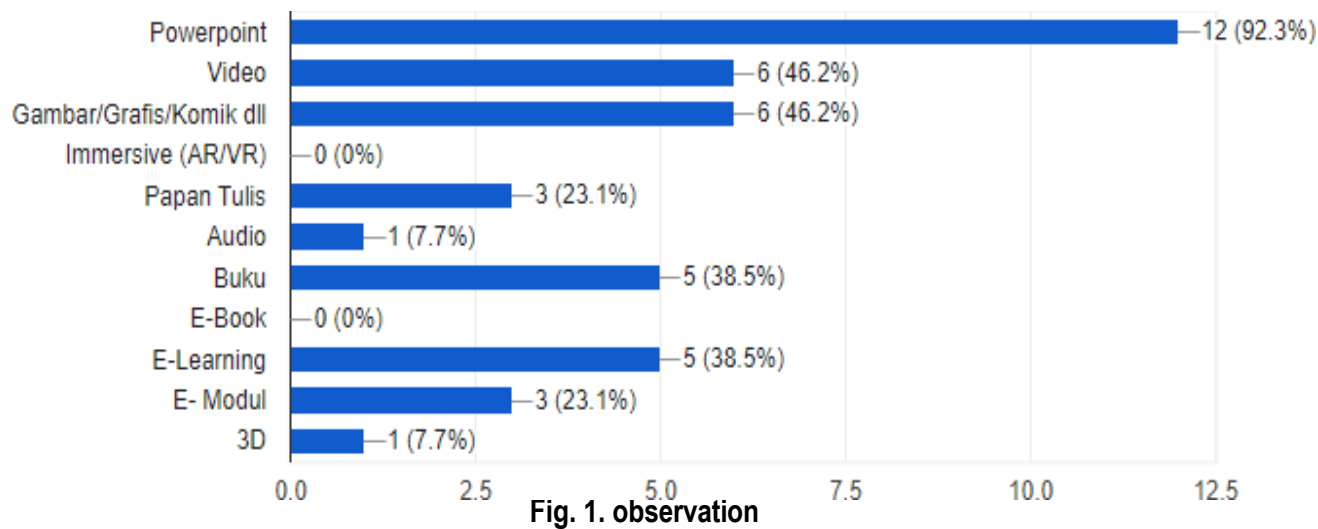
In developing technology, analyzing its needs is essential. Needs analysis (NA) is the first stage in the development of ESP courses Firdanu, R., Achmadi, S., & Wibowo, S. A. (2020) that serves as the basis for developing teaching materials, pedagogical activities, exams, assessments, and so on. In the development of AR, designers also need to understand the needs and desires of users by conducting interviews and direct observations of users Loup-Escande, E., et. al. (2014). Therefore, a needs analysis is needed to develop AR technology in microteaching practice for Technology Education students at FKIP Palangka Raya University.

## **Research Method**

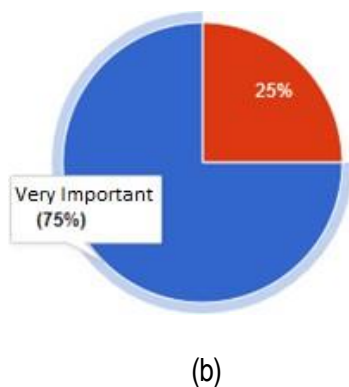
This study is a needs analysis focusing on identifying the requirements of educators and students regarding the use of immersive technology in microteaching practice. The needs analysis was conducted by collecting information from various sources. Data were obtained through literature review, questionnaire distribution, observation, and interviews. The research instrument used was a questionnaire designed to explore the media needs of educators and students. The collected data were analyzed both quantitatively and qualitatively. Quantitative analysis was carried out using percentage formulas to process the questionnaire results, while qualitative analysis was used to describe the findings and relate them to previous studies. The respondents consisted of students and educators from the Educational Technology Study Program at FKIP Palangka Raya University.

## **Result**

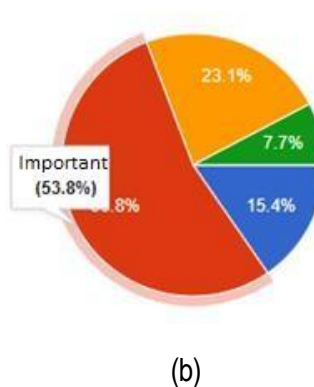
In a study related to the analysis of the needs of educators and students, an initial survey is required to determine the condition of the classroom during microteaching. The observation results indicate that educators predominantly use conventional digital media in microteaching, with PowerPoint being the most frequently utilized (92.3%), followed by videos (46.2%) and images/graphics (46.2%). Other media such as paper-based teaching aids (23.1%), e-modules (23.1%), e-learning (23.1%), and audio (7.7%) are used less frequently. Meanwhile, immersive technology-based media such as AR/VR have not been used at all (0%). These conditions can be seen in Figure 1.



The survey asked both teachers and students about the importance of using AR in developing learning media for the microteaching course through the use of immersive technology (AR/VR). The results showed that 75% of the educators answered that it was very important, while 53.8% of the students answered that it was important. These findings emphasize the relevance of AR integration in supporting microteaching practices. The details can be seen in Figure 2 for educators and Figure 3 for students.



**Figure. 2.** Educators



**Figure. 3.** Students

This phenomenon can also be observed in several interviews conducted with a number of educators. The conclusions drawn from these results are then explained in the following table.

**Table 1.** Interviews

<b>Aspect</b>	<b>Response</b>
The use of digital media in learning.	Use of digital media in learning Video, e-learning, e-module, but not yet using Immersive Technology (AR/VR)
The need for using AR media in microteaching materials.	The need for using AR media in microteaching materials This media is very important as it provides advanced learning experiences, but the limitation of cost can be a weakness in using this media.
AR media is an interesting media in the learning process.	AR media is an attractive media in the learning process Possibly attractive, as it has not been tried before.

Based on an analysis of the needs of educators and students regarding the use of immersive technology in microteaching materials, it has been found that digital media using immersive technology has never been used as a learning tool in classrooms. Teachers face obstacles in developing learning media due to limited funding and creativity. Educators also acknowledge the need for improvement in media usage, and one potential solution is to use immersive technology to capture students' attention and make learning more enjoyable as it is IT-based and can be used on students' mobile phones. Since this technology has not been used before, educators have also expressed that it may be a solution to make the learning process more interesting for students.

## Discussion

Research shows that teachers and students require learning media based on immersive technology, including Augmented Reality (AR). This is because they need media that can clarify learning materials and have an attractive appearance to stimulate students' learning interest. Augmented Reality (AR) is a technology-based learning media that allows individuals to interact with both virtual and real-world objects Firdanu, R., Achmadi, S., & Wibowo, S. A. (2020). The use of Augmented Reality (AR) in teaching and learning is rapidly developing because AR media can become a new computational platform in education Hakim, L. (2018); Krisnandry, F., & Bahri, S.

(2020). The use of augmented reality (AR) can increase exercise effectiveness and help pilots identify the position and distance between aircraft. Additionally, the use of AR technology in engineering education can be an effective tool to help students understand difficult technical concepts in a more interactive way Grodotzki, J., et. al. (2023). Furthermore, AR technology can be implemented in physical education training in schools Liu, Y, et. al. (2022). The use of AR technology can positively impact student academic achievement, enhance learning motivation, and develop cognitive and motor skills.

However, implementing AR technology still faces several challenges De Lima, et. al. (2022), including the cost of implementation. AR implementation requires expensive hardware and software, which may not be affordable for many schools and institutions, especially in developing countries Faqih, K. M. S. (2021) Other challenges include infrastructure limitations, lack of teacher training, and inadequate instructional design that can negatively affect the use of AR. Based on previous studies, it can be concluded that implementing AR in learning is crucial, even though there are challenges. Both educators and students are interested in using it to make learning more enjoyable and enhance cognitive abilities and learning outcomes.

## **Conclusion**

Based on the analysis of educators' and students' needs, it is clear that there is a strong interest in adopting Augmented Reality (AR) as an innovative solution to support microteaching practices. The results showed that 75% of educators considered AR very important, while 53.8% of students regarded it as important. Despite challenges such as financial constraints, both groups expressed willingness to integrate AR into the learning process to make microteaching more interactive, engaging, and effective in improving cognitive skills and learning outcomes. This study underlines the urgency of developing AR-based learning media for microteaching as a response to the current gap in technological integration. As a practical implication, the findings can serve as a foundation for designing AR prototypes tailored to teacher education. Furthermore, institutions may consider capacity building and resource allocation to facilitate the sustainable implementation of AR in microteaching.

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