# THE EFFECTIVENESS OF AUGMENTED REALITY TECHNOLOGY ON THE MOTIVATION TO LEARN ISLAMIC RELIGIOUS EDUCATION IN VOCATIONAL SCHOOLS

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**Abstract**

Islamic Religious Education (IRE) in vocational schools is frequently delivered through conventional instructional approaches that tend to be teacher-centered, which may limit student engagement and learning motivation. Advances in educational technology provide opportunities to create more interactive learning environments, including the application of Augmented Reality (AR)-based learning. This study aims to examine the effectiveness of Augmented Reality technology in enhancing students' learning motivation in Islamic Religious Education at a vocational schools. This study employed a quantitative approach using a quasi-experimental method with a nonequivalent control group design and a purposive sampling technique was used to select 46 vocational school students, divided into an experimental group (n = 21) and a control group (n = 25). Motivation to learn was measured using a questionnaire based on the ARCS motivation model (Attention, Relevance, Confidence, and Satisfaction). Data were analyzed using descriptive statistics (mean scores and normalized gain) and inferential statistics, including  assumption tests, paired-samples t-tests, independent-samples t-tests, and effect size analysis using Cohen's d. The results indicated a statistically significant difference in learning motivation between the experimental and control groups following the intervention ($p < 0.001$), with a Cohen's d value of 1.767, indicating a large effect size. These findings suggest that Augmented Reality technology is effective in enhancing students' motivation to learn Islamic  Religious Education in vocational schools.

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## INTRODUCTION

The development of adaptive and competitive students in response to 21st-century challenges and global dynamics is strongly influenced by the quality of education provided (Rahmadani & Qomariah, 2022). In recent years,

the effectiveness of educational processes has increasingly been supported through the integration of digital technologies, especially in improving interaction quality and the achievement of learning objectives (Endrawati Subroto et al., 2023). One of the rapidly developing technologies that has been increasingly adopted in education is Augmented Reality (AR) (Triyana Safitri et al., 2024). AR integrates two and three dimensional visual elements into real-world environments in real time, enabling learning experiences to become more engaging and immersive (Azuma, 1997).  In educational contexts, AR has been widely utilized as an interactive learning medium that enhances visual-based learning experiences and student engagement(Hasminda et al., 2024).

From a theoretical perspective, learning effectiveness increases when students are actively involved in constructing understanding through meaningful learning experiences (Arisanti et al., 2024). The Cognitive Theory of Multimedia learning emphasizes that information comprehension is optimized when content is delivered through dual processing channels verbal and visual rather than through text-based or lecture-only instruction(Ricard E. Mayer, 2001). A growing body of research suggests that interactive multimedia-based learning has enhances students' understanding and engagement. Beyond cognitive aspects, learning effectiveness is also closely associated with students' learning motivation(Setiawaty et al., 2024; Taroreh, 2024).

Learning motivation functions as a driving factor that influences students' persistence, attention, and engagement throughout the learning process(Ali et al., 2025; Azis Khoiri, 2018). The ARCS motivation model explains that learning motivation is influenced by four key components: attention, relevance, confidence, and satisfaction(Keller, 1987). Learning environments that address these components are more likely to sustain students' engagement and support meaningful learning(Simamora & Siregar, 2024).

In contemporary educational discourse, learning motivation is considered a crusial factor influencing students' academic engagement and achievement(Dima et al., 2023). Motivation not limited of influencing students' willingness to engage in learning activities, it also determines the depth of cognitive processing and persistence when encountering learning challenges (Anggraini et al., 2024). In vocational education settings, where students are expected to acquire both theoretical understanding and practical skills, maintaining high levels of learning motivation is particularly essential (Hikmah & Saputra, 2023).

Islamic Religious Education presents unique instructional challenges, as it involves abstract concepts, moral values, and spiritual understanding that are often delivered through textual explanations and verbal instruction(Santoso et al., 2023). Conventional teaching approaches may limit students' engagement, especially when instructional methods do not align with students' learning preferences or technological experiences, as digital-native learners, learners are increasingly familiar with interactive and visually rich environments, which may reduce their motivation when exposed to monotonous instructional practices(Nur Meizar et al., 2025).

The integration of technology into religious education therefore requires careful consideration of pedagogical design(Kirkwood & Price, 2014). Educational technologies should not merely function as visual supplements but must be aligned with learning objectives and instructional strategies. Augmented Reality offers distinctive advantages in this regard, as it allows digital content to be seamlessly embedded within real-world learning contexts. By combining visual, auditory, and interactive elements, AR offers pedagogical opportunities to support deeper learning active participation and facilitate the contraction of meaningful learning experiences.

In vocational high schools, instructional practices must foster both cognitive competence and motivational readiness(Hikmah & Saputra, 2023). Students are prepared to master academic knowledge while also developing attitudes and skills relevant to professional context. Motivation functions a key factor in this process, as motivated students are more likely to engage actively, persist when facing difficulties, and achieve learning objectives.

Pre-observation and pre-interview findings conducted with teachers and students at SMK Negeri 1 Kota Sorong from March 14 to 17, 2025, revealed that instructional technologies such as projectors were more frequently used in vocational subjects. In contrast, the pedagogical integration of technology in Islamic Religious Education had not been fully implemented in classroom learning. In practice, teachers utilized the Canva platform primarily for independent

assignments outside the classroom. This approach did not sufficiently promote interaction or active engagement during in-class learning activities.

Similar conditions were also observed in several other schools in the Sorong region, where learning activities continued to rely on one-way digital media and AR technology had not yet been adopted as a regular instructional practice. The findings suggest that the potential of educational technology remains underutilized in Islamic Religious Education.

Previous studies have indicated that empirical evidence suggests that Augmented Reality enhances students' cognitive understanding as well as their motivation and interest in learning . However, most existing studies have primarily focused on general subjects and elementary to secondary education levels (Abdullah, 2024; Hasminda et al., 2024; Masruroh & Maghfiroh, 2025; Setiawaty et al., 2024; Simamora & Siregar, 2024). Research that specifically examines the despite growing interest in educational technology, empirical studied addressing the effectiveness of Augmented Reality in enhancing students' motivation in Islamic Religius Educational high schools are still limited.

In order to maximized the instructional effectiveness of AR-based learning, this study incorporated structured student worksheets within each AR display . These worksheets functioned as structured learning guides that supported students' active engagement, exploration, and reflection throughout the learning process. Based on these considerations, this study aims to examine the effectiveness of Augmented Reality in enhancing students' learning motivation in Islamic Religious Education at vocational high schools.

The rapid development of technology necessitates the integration of digital media that not only serves an informational function but also facilitates meaningful and structured learning experiences. In this study, Augmented Reality is not positioned merely as a visualization tool but as an integral component of an instructional strategy embedded within students' learning activities. Accordingly, this study introduces a novel approach by integrating multimodal Augmented Reality combining three dimensional visualization, audio narration, and learning content with structured student worksheets as guided learning activities (Sari & Sulisworo, 2023)

The worksheets function as scaffolding tools that systematically guide students' interaction with AR content through stages of exploration, observation, discussion, and problem solving(Sari & Sulisworo, 2023). By scanning QR codes using smartphones, students can independently access AR-based learning materials within real-world contexts, while teachers act as facilitators who guide the learning process. This integration of AR and student worksheets is expected to enhance the fulfilment of the ARCS motivation components of attention, relevance, confidence, and satisfaction and align with the Cognitive Theory of Multimedia Learning, which emphasizes the simultaneous processing of visual and verbal information (Keller, 1987; Ricard E. Mayer, 2001). Based on this rationale, the present study aims to examine the effectiveness of Augmented Reality technology integrated with student worksheets in enhancing learning motivation among students in Islamic Religious Education at vocational high schools.

## METHOD

The study was designed as a quantitative investigation employing a quasi-experimental nonequivalent control group design and a purposive sampling technique (Sugiyono, 2010).This design was selected because the grouping of research subjects was conducted using existing classes without full randomization; however, it still allowed for a comparison of differences in learning motivation between the experimental and control group based on similarities in grade level, curriculum, instructional materials, and student characteristics.

The research population consisted of all eleventh-grade students who participated in Islamic Religious Education learning in the 2025/2026 academic year at SMK Negeri 1 Kota Sorong, with a total of 46 students involved as research subjects. Participants were categorized into two groups: the experimental group consisting of 21 eleventh-grade students from the Network and Telecommunications Engineering program who received Augmented Reality– based learning integrated with Student Worksheets (LKPD), and a control group comprising of 25 eleventh-grade

students from the Office Management and Business Services program who were thought using conventional instructional methods.

Augmented Reality instruction was implemented in the experimental group, whereas conventional instructional methods were applied in the control group. The AR media were designed using a multimodal approach that integrated three-dimensional object visualization, audio narration, and student worksheets. Students accessed the AR media by scanning barcodes using smartphones.

Students' learning motivation was measured before and after the intervention using a questionnaire developed in accordance with the ARCS motivation framework. The instrument utilized a five-level Likert scale to measure students' responses. The obtained data were examined through descriptive statistical analysis, encompassing mean values and normalized gain, followed by inferential statistical analyses.

Assumption tests were conducted prior to hypothesis testing, including normality and homogeneity of variance tests. Hypotheses were examined through paired-sample and independent-sample t-test procedures, while the magnitude of the intervention effect was estimated using Cohen's d (Cohen Jacob, 1988).

## RESULT AND DISCUSSION

The questionnaire instrument was pilot tested on 30 students outside the research sample. The reliability test produced a Cronbach's alpha value of 0.921, reflecting a very high degree of internal consistency. The result of the validity analysis showed that all questionnaire items satisfied the minimum requirement for corrected item-total correlation values and were therefore considered valid. The results of the Reability and validity tests of the questionnaire are presented in table 1.

**Table 1. Reability and Validity Test Result of the Questionnaire**

| Aspect | Indicator | Result | Interpretation |
|--------|-----------|--------|----------------|
| Pilot Test | Number Of Students | 30 | Adequate |
| Reability | Cronbach's Alpha | 0.921 | Very high |
| Validity | Corrected item-total correlation | All items valid | Acceptable |

**Source** : SPSS Data Analysis version 27

Descriptive statistical analysis revealed that Both group demonstrated gains in learning motivation. Specifically, the experimental group showed an increase in mean scores from 72.90 prior to the intervention to 84.05 afterward. In contrast, In comparison, the control group demonstrated a smaller gain, with mean scores rising from70.56 at pre-test to 75.56 at post-test. The normalized gain analysis revealed a moderate level of improvement in the experimental group, with an N-gain value of 0.41 and control group demonstrated a low level of improvement with an N-gain value of 0.16. Descriptive statistics of students' learning motivation are presented in table 2.

**Table 2. Descriptive Statistics of Student's Learning Motivation**

| Group | Test | Mean Score | N-Gain | Category |
|-------|------|------------|--------|----------|
| Experimental | Pre-test | 72.90 | - | - |
| Experimental | Post-test | 84.05 | 0.41 | Moderate |

| | | | | |
|---|---|---|---|---|
| Control | Pre-test | 70.75 | - | - |
| Control | Post-test | 75.56 | 0.16 | Low |

**Source:** Authors' calculation using Microsoft Excel (2016)

Normality testing showed that the experimental group data followed a normal distribution, while the control group initial post-test data did not completely satisfy the normality assumption. However, a The residual normality test confirmed that the residuals were normally distributed, thereby permitting further inferential statistical analysis. The variance homogeneity assessment using Levene's test produced a significance value of 0.531 ( $p > 0.05$), indicating equal variances between thee two groups. The Result of the normality and homogeneity tests are presented in Table 3.

**Table 3. Result of Normality and Homogeneity Tests**

| Test | Test | Statistic | Sig. (p-value) | Category |
|---|---|---|---|---|
| Normality (shapiro wilk) | Experimental (Post-test) | - | $P > 0.05$ | Normal distribution |
| Normality (shapiro wilk) | Control (Post-test) | - | 0.41 | Not normally distributed |
| Residual Normality (shapiro wilk) | Residuals | - | - | Normal distribution |
| Homogeneity (Levene's Test) | Experimental vs control | - | 0.16 | Homogeneous variance |

**Source:** SPSS Data Analysis Version 27

The result of the paired-sample t-test revealed a statistically significant difference between the pre-test and post-test learning motivation scores in the experimental group ($p < 0.001$). Furthermore, The independent-samples t-test indicated a statistically significant difference in post-test learning motivation scores between the experimental and control groups ($t = 5.970$; $p < 0.001$). Effect size analysis yielded a Cohen's d value of 1.767, which represent a large effect. The result of the paired-sample t-test, and effect size analysis are in table 3.

**Table 3. Result of Hypothesis Testing and Effect size Analysis**

| Test | Comparison | Statistic | Sig. (p-value) | Interpretation |
|---|---|---|---|---|
| Normality | Experimental (Pre-test vs Post-test) | - | < 0.001 | Significant difference |
| Normality | Experimental vs control (post-test) | $t = 5.970$ | < 0.001 | Significant difference |
| Effect size | Cohen's d | 1.767 | - | Large effect |

**Source:** SPSS Data Analysis Version 27

These findings are consistent with the ARCS motivation model and the Cognitive Theory of Multimedia Learning. AR-based learning effectively enhanced students' attention through immersive three-dimensional visualization and audio narration. The contextualized presentation of learning materials supported relevance, while

structured worksheets enhanced students' confidence by providing clear learning pathways. Satisfaction was achieved through successful task completion and active engagement (Keller, 1987; Ricard E. Mayer, 2001).

From an empirical perspective, The findings of this study are consistent with prior research highlighting the motivational advantages of technology enhanced learning environments. Studies examining AR-based instruction have reported improvements in students' attention, engagement, and learning motivation across different educational levels (Abdullah, 2024; Hasminda et al., 2024; Masruroh & Maghfiroh, 2025; Setiawaty et al., 2024; Simamora & Siregar, 2024).

Compared to conventional digitalized media, AR provides a higher level of interactivity and immersion. Students were not merely passive recipients of information receivers, student became active participants who engaged with learning content through structured activities. This interactive engagement differentiated AR-based learning from one-way digital instruction (Azuma, 1997).

Informal interviews with students in the experimental group provided additional insights into their learning experiences. Students reported increased enthusiasm for learning because they could observe learning materials in three-dimensional form. They also noted that the learning content reflected real-life situations such as social conflicts, drug abuse, and alcohol consumption, which increased their interest and motivation. Several students expressed hopes that AR-based learning could be applied to other subjects, indicating high acceptance and perceived usefulness.

The strong effect size observed suggests that motivational gains were not merely the result of technological novelty but reflected meaningful changes supported by pedagogically grounded instructional design (Clark, 1983).

The result of this study offer deeper insight into how instructional structure in mediating the relationship between technology use and student motivation. While Augmented Reality offers immersive features that naturally attract students' attention, the integration of structured worksheets ensured that learning activities remained focused and goal-oriented. This instructional scaffolding played a critical role in transforming initial engagement into sustained motivation, preventing students from becoming distracted by technological novelty(Sari & Sulisworo, 2023).

From the standpoint of the Cognitive Theory of Multimedia Learning, effective learning occurs when instructional materials are designed to optimize information processing across verbal and visual channels. In this study, AR-based learning environments combined visual representations with audio narration and guided tasks, allowing students to process information more effectively (Ricard E. Mayer, 2001). The presence of structured worksheets further supported this process by directing students' attention to essential concepts and reducing cognitive overload. As a result, students were better able to construct meaningful understanding while maintaining motivation throughout the learning process.

The substantial effect size identified in this study indicated that the motivational gains were not merely temporary or superficial. Instead, these gains reflect meaningful changes in students' learning experiences supported by pedagogically grounded instructional design. This finding is particularly important, as previous studies have cautioned that technology-enhanced learning may produce short-term enthusiasm without lasting impact when instructional guidance is insufficient (Clark, 1983; Kirkwood & Price, 2014). The present results demonstrate that AR-based learning can produce substantial motivational benefits when implemented systematically and supported by appropriate instructional strategies.

Moreover, the contextual relevance of learning materials embedded within the AR media contributed significantly to students' motivation. Learning content that reflects real-life situations familiar to students enhances perceived relevance, Which constitutes a core element of ARCS motivation model. When students recognize that learning activities are connected to their everyday experiences, They are more inclined to participate actively and exert grater effort throughout the learning process. This relevance fosters deeper engagement and supports the development of positive learning attitudes.

Overall, these findings reinforce the view that the effectiveness of AR-based learning is not determined solely by technological innovation. Rather, meaningful learning outcomes emerge when technology is integrated with sound pedagogical principles, structured instructional support, and motivational theory(Setiawaty et al., 2024). This study therefore adds to the expanding body of scholarly literature emphasizing that educational technology must be pedagogically grounded to achieve sustained motivational and learning benefits.

Furthermore, the result of this study underscore the significance of students' perceived learning experience as a determinant of motivation(Dima et al., 2023). When leaners perceive instructional actives as enjoyable, meaningful,

and relevant to their personal and social contexts, they are more likely to demonstrate positive learning behaviors. The use of Augmented Reality in this study provided students with opportunities to engage with learning content in ways that differed from conventional classroom instruction, there by fostering a sense of novelty while maintaining instructional relevance.

The interactive nature of AR-based learning also encouraged active exploration rather than passive reception of information (Azuma, 1997). Students were required to observe, interpret, and respond to visual representations presented through the AR media, which promoted deeper cognitive engagement. This active involvement supports constructivist perspectives that emphasize that knowledge is constructed through experience and interaction instead of passive instructional delivery (Arisanti et al., 2024).

Furthermore, the combination of AR technology and structured worksheets supported students' self-regulation during learning activities. Worksheets functioned as learning guides that helped students organize their thoughts, monitor their progress, and complete tasks systematically. This structured support contributed to students' confidence and reduced uncertainty during the learning process, which in turn enhanced motivation. These findings suggest that AR-based learning is most effective when technological innovation is accompanied by instructional structure and pedagogical guidance.

The outcomes of this study have important implications for educational practice. Teachers of Islamic Religious Education are encouraged to integrate AR-based learning with structured instructional tools when teaching abstract and value-based content. Educational institutions should support technology integration through adequate infrastructure and professional development.

Despite the positive outcomes, this study has several limitations. The sample was limited to one vocational high school, Which may limit the generalizability of the findings. In addition, the intervention was implemented over a relatively short period. Future research is encouraged to involve larger samples, longer implementation periods, and mixed-method approaches to explore long-term motivational outcomes.

## CONCLUSION

This study demonstrates that Augmented Reality -based learning integrated with structured worksheets is effective in increasing student learning motivation in Islamic Religious Education at vocational high schools. The findings further affirm the applicability of the ARCS motivation model and the cognitive theory of multimedia learning in explaining how interactive and multimodal instruction od Aumented Reality with well planned pedagogical structures not only enhances motivation but also promotes active participation and meaningful learning experiences. Therefore, the use of AR technology accompanied by sound instructional design is recommended as an innovative approach to improve learning motivation and engagement in religious education contexts.

## REFERENSI

Abdullah, S. (2024). *Penerapan Teknologi Augmented Reality Dalam Pembelajaran Agama Islam*. https://doi.org/10.30651/jms.v9i3.22684

Ali, A., Fenica, S. D., Aini, W., Hidayat, A. F., & Jambi, U. (2025). *Efektivitas Media Pembelajaran Interaktif dalam Meningkatkan Minat dan Motivasi Belajar Siswa Sekolah Dasar. 3*(1), 1–6.

Anggraini, S., Akip, M., & Azman, Z. (2024). Pengaruh Motivasi Belajar Terhadap Hasil Belajar Siswa Kelas Vii Pada Mata Pelajaran PAI Di SMP-IT Nur Riska Lubukinggau. *Ej*, *6*(2), 165–173. https://doi.org/10.37092/ej.v6i2.605

Arisanti, F., Sulthon Habiby, J., & Muttaqin, A. (2024). PENGGUNAAN TEKNOLOGI AUGMENTED DENGAN PENDEKATAN STUDI EKSPLORATIF REALITY DALAM PEMBELAJARAN ANAK USIA DINI. In *JOECES Journal of Early Childhood Education Studies* (Vol. 4, Issue 1).

Azis Khoiri, A. (2018). *PENERAPAN MODEL PEMBELAJARAN ARCS (ATTENTION, RELEVANCE, CONFIDENCE, SATISFACTION) TERHADAP PEMBELAJARAN FABEL DI SMP/MTs KELAS VII*.

Azuma, R. T. (1997). A Survey of Augmented Reality. In *Presence: Teleoperators and Virtual Environments* (Vol. 6). http://www.cs.unc.edu/~azumaW:

Clark, R. E. (1983). Reconsidering Research on Learning from Media. In *Review of Educational Research* (Vol. 53, Issue 4).

Cohen Jacob. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Lawrence Erlbaum Associates.

Dima, A., Kleden, M. A., & Atti, A. (2023). Analisis Faktor-Faktor yang Mempengaruhi Prestasi Siswa Menggunakan Metode Structural Equation Modeling (SEM). *Statistika*, *23*(2), 132–146. https://doi.org/10.29313/statistika.v23i2.2642

Endrawati Subroto, D., Wirawan, R., & Yanto Rukmana, A. (2023). Implementasi Teknologi dalam Pembelajaran di Era Digital: Tantangan dan Peluang bagi Dunia Pendidikan di Indonesia. In *Jurnal Pendidikan West Science* (Vol. 01, Issue 07).

Hasminda, D., Wahyuni, S., & Asmah, S. (2024). Persepsi Siswa SMP Terhadap Pelaksanaan Pameran Media Pembelajaran Biologi Berbasis Augmented Reality Di Desa Bonto Majannang. *ORYZA ( JURNAL PENDIDIKAN BIOLOGI )*, *13*(2), 233–239. https://doi.org/10.33627/oz.v13i2.2766

Hikmah, S. N., & Saputra, H. (2023). *Korelasi Motivasi Belajar dan Pemahaman Matematis terhadap Hasil Belajar Matematika* (Vol. 5, Issue 1).

Keller, J. M. (1987). Development and Use of the ARCS Model of Instructional Design. *Departement of Journal Research*.

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: what is "enhanced" and how do we know? A critical literature review. *Learning, Media and Technology*, *39*(1), 6–36. https://doi.org/10.1080/17439884.2013.770404

Masruroh, M., & Maghfiroh, M. (2025). Penerapan Augmented Reality dan Game Family 100 untuk Meningkatkan Pemahaman Murid pada Materi Fikih Ibadah SMPN 1 Proppo. *Jurnal Pendidikan Dan Teknologi Indonesia*, *5*(11), 3329–3341. https://doi.org/10.52436/1.jpti.1162

Nur Meizar, S. A., Setiawati, S. K., & Rachman, I. F. (2025). Studi Komparatif Pembelajaran Tradisional dan Pembelajaran Berbasis AI terhadap Kemampuan Bernalar Siswa SMP. *Jurnal Nyanadassana: Jurnal Penelitian Pendidikan, Sosial Dan Keagamaan*, *4*(1), 61–72. https://doi.org/10.59291/jnd.v4i1.100

Rahmadani, R., & Qomariah, S. (2022). Menciptakan Keunggulan Bersaing Berkelanjutan Berbasis Sumber Daya Manusia dalam Dunia Pendidikan. *Tarbiyah Wa Ta'lim: Jurnal Penelitian Pendidikan Dan Pembelajaran*, 108–117. https://doi.org/10.21093/twt.v9i2.4272

Ricard E. Mayer. (2001). mayer-r-e-2005-cognitive-theory-of-multimedia-learning-the-cambridge-handbook-of-multimedia-learning-31-48. *Cambridge Univercty Press*, 31–48.

Santoso, B., Triono, M., & Zulkifli, &. (2023). Tantangan Pendidikan Islam Menuju Era Society 5.0: Urgensi Pengembangan Berpikir Kritis dalam Pembelajaran PAI di Sekolah Dasar. *Jurnal Papeda*, *5*(1).

Sari, I. N., & Suliswordo, D. (2023). Pengembangan LKPD Berbasis Augmented Reality Sebagai Media Pembelajaran Matematika. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *7*(1), 1. https://doi.org/10.33603/jnpm.v7i1.5347

Setiawaty, S., Lukman, I. R., Imanda, R., Sudirman, S., & Rauzatuzzikrina, R. (2024). Integrating Mobile Augmented Reality Applications Through Inquiry Learning To Improve Students' Science Process Skills And Concept Mastery. *Jurnal Pendidikan IPA Indonesia*, *13*(1), 90–102. https://doi.org/10.15294/jpii.v13i1.48891

Simamora, E. W., & Siregar, N. N. (2024). Pengembangan Media Pembelajaran Augmented Reality pada Materi Bangun Ruang untuk Kelas V SD. *Konstruktivisme : Jurnal Pendidikan Dan Pembelajaran*, *16*(2), 298–308. https://doi.org/10.35457/konstruk.v16i2.3588

Sugiyono. (2010). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

Taroreh, L. H. J. (2024). *PEDASUD : Jurnal Ilmu Pendidikan Guru Sekolah Dasar dan Usia Dini EFEKTIVITAS MEDIA PEMBELAJARAN INTERAKTIF BERBASIS TEKNOLOGI DALAM MENINGKATKAN PEMAHAMAN KONSEP IPA*.

Triyana Safitri, N., Wulan Tersta, F., Kurniawan, D., Keguruan dan Ilmu Pendidikan, F., & Jambi, U. (2024). Pelatihan Penggunaan Media Pembelajaran Berbasis Augmented Reality Terintegrasi Kearifan Lokal Bagi Guru SMP Kota Jambi. *Journal of Human And Education*, *3*(4), 493–499.