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Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran
https://e-journal.undikma.ac.id/index.php/jurnalkependidikan/index

Vol. 11, No. 3 : September 2025
E-ISSN: 2442-7667
pp. 1163-1173
Email: jklppm@undikma.ac.id

Developing Augmented Reality-Based Modules for Strengthening Pancasila Student Profiles in Elementary School Students

Sukirno[1*], Marjanah[2], Irma Dewi Isda[3]
[1*]PGSD Study Program, [2]Biology Education Study Program, [3]English Language Education Study Program, Universitas Samudra, Indonesia.
***Corresponding Author. Email: sukirno@unsam.ac.id**

Abstract: This research aims to develop an Augmented Reality media-based module with learning the Pancasila Student Profile Strengthening Project that is feasible and effective for fourth-grade students in elementary schools. This research starts by examining the demands and traits of the prospective audience, then continues with the design of a module that utilizes AR technology to provide a more dynamic learning experience. This study employed the research and development method with the ADDIE model, which consists of five main stages: analysis, design, development, implementation, and evaluation. The data analysis techniques employed included qualitative and quantitative descriptive approaches. Qualitative data were obtained from observations of the implementation of the teaching module, while quantitative data were obtained from assessments by content experts and material experts, as well as from questionnaires. The results indicated that the media expert validation reached a percentage of 90.97%, and material experts reached 85.00%, both of which fall into the 'excellent' category. Therefore, the media was deemed suitable for use in learning. The field trial involved 60 students. The results showed that in the small group trial, the media obtained a percentage value of 90.63%, categorized as 'excellent', while in the large group trial, it obtained a percentage value of 92.73%, also categorized as 'excellent'. Based on the feasibility and effectiveness evaluations, the module is suitable and effective for use by fourth-grade students of SD Negeri Tualang Cut Aceh Tamiang. Thus, the AR-based module is an innovation that can enhance the quality of learning by making content dynamic and interactive.

Article History
Received: 14-07-2025
Revised: 17-08-2025
Accepted: 31-08-2025
Published: 25-09-2025

Key Words:
Augmented Reality; Module; Pancasila Student Profile Strengthening Project.

How to Cite: Sukirno, S., Marjanah, M., & Isda, I. D. (2025). Developing Augmented Reality-Based Modules for Strengthening Pancasila Student Profiles in Elementary School Students. *Jurnal Kependidikan*, *11*(3), 1163-1173. https://doi.org/10.33394/jk.v11i3.17123

https://doi.org/10.33394/jk.v11i3.17123

Introduction

The need for adjustments in the education system is rising due to fast technological advancements as well as progression of information especially in the period of Industrial Revolution 4.0. The Merdeka Curriculum or independent curriculum in Indonesia is one through which students are made ready to be subjected to the challenges from the world and to adapt to the fast changes happening around the working and living environments. The curriculum will be completely put into effect by the year 2024 (Hamdi et al., 2022). These program incorporates a Pancasila student profile, which is a framework for graduates to demonstrate desired character traits and competencies while upholding the esteemed values of Pancasila (Kholik et al., 2022; Yayuk et al., 2023). Characteristics of an independent curriculum implementing project-based learning (Nisfa et al., 2022). Project refers to collaborative endeavors focused on specific subjects or concepts, tailored to the preferences, backgrounds, and abilities of children under the supervision of a teacher, enabling them to engage in exploration (Akyol et al., 2022). While the Pancasila learner profile means the

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targeted plan for Indonesian students to be lifelong learners, excel in personality according to Pancasila as the life philosophy (Shalikha, 2022).

The project integrates activities with the value of Pancasila as the identity of the Indonesian nation. Formulated to carry out education through the Pancasila student profile strengthening project, the value of Pancasila as an identity of the Indonesian nation has been very relevant to the situation in the student environment (Nurhayati & Marsidin, 2022). If an education sector in the 21st century has to move hand in hand with scientific and technological advancement, then it needs to create a classroom environment that would meet these needs (Sutrisno, 2021). The effect of technology is imperative for bringing about changes in all walks of life and enhancing the skills and knowledge of people at large (Aditama et al., 2019). Technology cannot be understated in its role within education at the moment. This is well evidenced by the shift from traditional teaching aids to digital resources (Arifin et al., 2023).

Digital era challenges, one of which is technology in this current era of globalization. From these challenges, the government seeks superior and competitive resources, especially through education in learning (Al-Tabany, 2017). Basically, it is a means of digital technology that teachers and pupils can engage through in interaction and share material in the process of learning (Alam & Mohanty, 2023). The schooling system should use digital technology for education by way of example, using electronic media for teaching and learning activities (KBM) (Irawan & Yatri, 2022). E-modules provide a new setting for students since they are in electronic form, thus easily accessible (Putri & Syarifuddin, 2023). One of the advantages of e-modules includes flexibility of access, as learners can access anytime, anywhere as per their needs (Atikah et al., 2021). E-modules have several types used in education a) text-based e-modules, b) multimedia-based e-modules, c) interactive e-modules, d) simulation-based e-modules, e) game-based e-modules, f) project-based e-modules, g) course-based e-modules, h) augmented reality (AR) based e-modules (Putri & Hendriyani, 2023).

In fact, the use of learning media related to technology is still rarely used by teachers. This is because of the various reasons, one of which is that the teachers themselves are in short supply of skills and knowledge in IT, the difficulty of designing IT-based media, the difficulty of operating IT learning media, inadequate facilities and infrastructure, lack of teacher creativity and teachers who are elderly (Amelia & Marini, 2022). The use of technology in educational materials is not being maximized, and the Pancasila student profile has not been implemented in schools, more particularly in classrooms. This is due to the fact that teachers do not really understand how the implementation of the Pancasila profile applies to them as teachers. The integration of the Pancasila student profile into the curriculum has not been at its best because of the existence of several obstacles that further reduce information (Maghfirani & Romelah, 2023).

Based on the results of observations and interviews with teachers at SD Negeri 1 Tualang Cut, Aceh Tamiang Regency, it is known that teachers tend to reuse the same teaching materials in the learning process in the classroom. Students feel less engaged in learning and challenged to grasp the material being taught because this kind of learning material is not varied. This makes the students often create a less conducive atmosphere in the class, resulting in disruptions in the learning process involving technology and the dimensions of the Pancasila student profile. Accordingly, the students' interest in learning declines. The decrease in interest in learning can be revealed by the student's inattentiveness and disinterest in whatever the teachers teach them while in class (Putri et al., 2019; Sugiyati, 2016).

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These difficulties can be overcome only by some engaging, creative, technology-driven learning tools. One of the important tools is augmented reality. Augmented reality displays the real world that is artificially overlaid with virtual objects in 2D or 3D real-time format (Elisa & Wiratmaja, 2019; Seviana et al., 2023). Since augmented reality can display abstract ideas in a form that people understand, the usage of a model for the object makes it to be very beneficial for learning (Aditama et al., 2019; Faiza et al., 2022). Character education thus has a major part to play in the learning process to enable students to better their status in a classroom. Therefore, character plays an imperative role in enabling students to develop a productive mind in education since it is the foundation that needs to be given uttermost priority in the management of education (Fajar & Putra, 2021; Nuraeni & Lubis, 2022).

Augmented reality learning tools could improve students' academic achievement (Wibowo et al., 2022). The incorporation of AR in teaching will enhance the interest of students in science subjects at the fourth grade level in elementary school (Oktaviani et al., 2019). It is found that Augmented Reality works on interesting students in their studying process (Salsabila et al., 2023). It may also trigger motivation in digital native students with interactive 3D AR technology (Carolina, 2023). On this view, it is deduced that the use of an AR-based Thematic Learning E-Module, integrated with Pancasila Student Profile, is quite appropriate and effective as a learning tool (Mahmud & Cempaka, 2022; Wibowo et al., 2022).

The Augmented Reality media-based module in the Pancasila Student Profile Strengthening Project learning is relevant to the current digital era and must be optimized to utilize the presence of the metaverse, especially in achieving learning interest which ultimately has a positive impact on learning outcomes. In addition, this media helps teachers in providing more realistic learning media. This research aims to create an Augmented Reality media-based module with learning the Pancasila Student Profile Strengthening Project that is feasible and effective for fourth-grade students in elementary schools.

Research Method

This research used the research and development (R&D) method with the ADDIE model (Branch, 2009) in five phases: analyze, design, development, implementation, and evaluation. The model used was the ADDIE development model (see Figure 1).

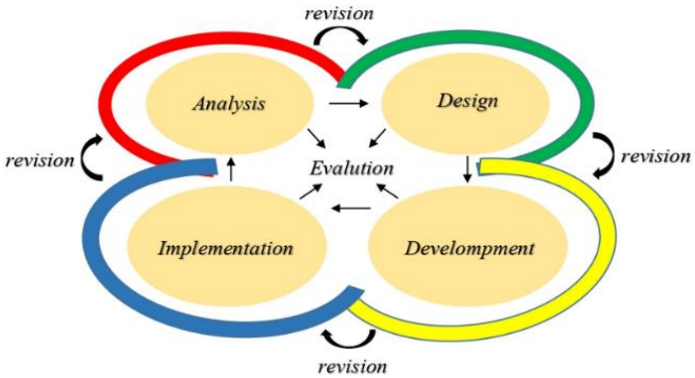

Figure 1. Development Stages of the ADDIE Model

Based on the image above, the ADDIE model developed in this study consists of five stages. First, the Analysis stage includes identifying needs, learning outcomes, and a literature review related to the Pancasila Student Profile. Second, the Design stage focuses on designing an Augmented Reality (AR)-based learning module integrated with the values of

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the Pancasila Student Profile. Third, the Development stage includes the creation of an AR-based digital learning module and validation by experts to obtain input, suggestions, and comments as a basis for product improvement. Fourth, the Implementation stage is carried out through module trials in schools accompanied by questionnaires by teachers and students to assess the level of practicality and effectiveness of the product. Finally, the Evaluation stage aims to review the implementation results and make revisions, so that the final product is more optimal and suitable for use in learning.

Results and Discussion

The development of this augmented reality-based module utilizes professional media capable of integrating text and images within the context of the Pancasila Student Profile Strengthening Project. The module creation process utilizes an application that allows visualization of learning materials in augmented reality. The following image represents the product resulting from the development of this augmented reality-based module.

Analysis Stage

The first process was the need and requirement analysis before the media is to be produced. During this stage, the researchers have looked carefully at student characteristics, needs of schools, field problems, and properties of materials. Moreover, research had also been done relating to the need and availability of instructional materials that could support students during their learning process.

Design Stage

The second stage is design, which is the process of preparing a framework for making media. At this stage, researchers design all the needs needed to develop the media. This process is carried out based on a frame of reference that takes into account the material, the characteristics of the learners, and the school curriculum.

Development Stage

The third process is media production, where content is developed according to set specifications and resources. It makes use of a number of tools, some of which are Deppmotion, Bender, Mixamo, Worldcast, and Canva among others in producing the media. The final product in this stage is the final product of the module using AR media.

(a) (b)

Figure 2. E-Module Design (a) E-Module Caver, (b) E-Module Display of Pancasila Students Profile Strengthening Project with Augmented Reality Media

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The developed augmented reality-based module displays interactive visualizations of Pancasila symbols and medicinal plants. Each material is presented with an intuitive interface design, combining text, images, and three-dimensional elements that can be accessed through the augmented reality feature. In the Pancasila symbols section, students can observe visual representations of each symbol along with a more in-depth description of the meaning and values contained within. Meanwhile, in the medicinal plants section, the module displays images and scientific information regarding their types, morphological characteristics, and benefits, which can be explored through an interactive display. This display design, as shown in the following image, is designed to increase student engagement and enrich the learning experience through technology integration, in this case as seen in the image below.

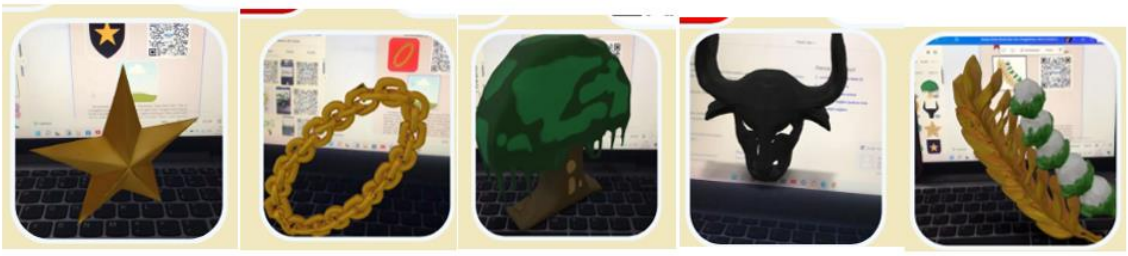

Figure 3. Pancasila Symbols Based on Augmented Reality Media

Figure 4. Medicinal Plants Based on Augmented Reality Media

Expert tests and trials of the product feasibility evaluation are conducted in two independent test groups, which will yield information about the viability of the product. The process is broken down as shown.

a) Material Expert Test

Validation by experts means seeking reviews, comments, suggestions, and advice on how best to improve the content being developed for the digital learning materials. The appropriateness, presentation, and language of the content material are reviewed by material experts. Table 1 summarizes the feedback from the material experts.

Table 1. Results of Material Expert Assessment

No	Aspects	Indicator	Score				Average
			V1	V2	V3	V4	
1.	Content Feasibility	Suitability of material with ELOs	4	4	4	3	3.75
		The accuracy of the material	4	3	3	3	3.25
		The meaningfulness of learning materials	3	3	4	3	3.25
		The recency of the learning material	4	4	3	3	3.75
Validation Score %							**87.5**
2.	Presentation	Material presentation technique	4	3	3	3	3.25
		Presentation Support	3	3	4	4	3.5
		Student engagement	3	3	3	4	3.25

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		Feedback feasibility	4	4	4	3	3.75
		Feasibility of formative questions	3	3	3	3	3.25
Validation Score %							**85.00**
3.	Linguistics	Tasks	4	3	3	3	3.25
		Communicative	3	3	3	3	3.25
		Dialogical and interactive	4	4	4	3	3.75
		Appropriateness to students' developmental level	3	3	3	3	3.00
		Orderliness and cohesiveness of thought	4	3	3	3	3.25
Validation Score %							**82.5**
Overall validity score							**85.00**
Category							**Very Valid**

The review by the material expert on the e-module with professional augmented reality media yielded an average score of 85.00%. This grade indicates that the developed digital teaching materials are of good quality and can thus be used without any revision. The expert arrived at this score based on the assessment of the content, presentation, and language, all of which received an average positive rating. However, it did not get a 100% score because of the insufficiencies that were noted in the tool like rewards for both correct and incorrect responses in exercises, incomplete materials, and incomplete exercise questions and instructions. Likewise, some videos and images needed further explanations and proper citations. The suggestions by the material expert were considered by the researcher.

b) Media Expert validation

Validation by media professionals shall evaluate augmented reality e-module product usability. Among the criteria that are used by media professionals are design, graphical and color scheme, font style, navigation buttons, interactivity features, appropriateness of augmented reality visuals, and user-friendliness and readability of text in media. Results of the evaluation by media have been summarized and displayed in the visual form of Table 2.

Table 2. Results of Media Expert Validation

No	Aspects	Indicator	Score				Average
			V1	V2	V3	V4	
1.	Graphics	Homepage	4	4	4	3	3.75
		Illustration	4	3	3	3	3.25
		Color composition	4	4	3	4	3.75
		Selection of font type and size	4	4	4	4	4
		Layout (navigation icons)	4	4	4	3	3.75
		Interactivity	3	4	4	4	3.75
		Feasibility of media images	4	4	4	3	4
		Ease of use	3	3	4	3	3.25
		Text Readability	4	4	4	3	3.25
Validation Score %							**81.87**
Overall validity score							**90.97**
Category							**Very Valid**

The professional augmented reality media-based e-module was tested by the media expert for a score of 90.97%. It means that the augmented reality media product is very credible and can be used without any change. As for the practicality test, it involved small and large group trials with students. Following are the details:

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a) Small Group Trial

The small group trial seeks to identify initial problems when augmented reality media is used. Through this trial, it is expected that there will be no fundamental problems when the augmented reality media images of the Pancasila Student Profile Reinforcement Project are used in learning. This trial was conducted by SD Negeri 1 Tualang Cut Aceh Tamiang students in small groups, as shown in Figure 5.

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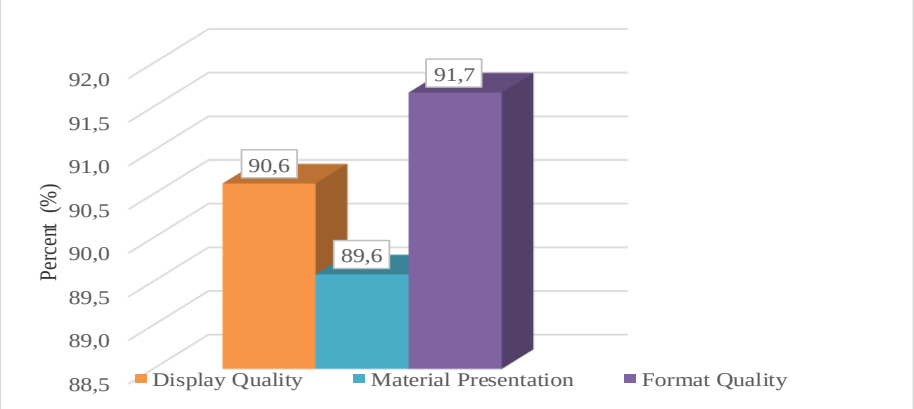

Figure 5. Results of Small Group Test Assessment

As in Figure 5, the evaluation done by students in small groups concerning the display quality of the professional augmented reality media-based module indicated a ratio of 90.6 percent, a material presentation ratio of 89.6 percent, and a format quality ratio of 91.7 percent. Furthermore, these three aspects of evaluation combine to have an average score of 90.63%. It could thus be said that the developed module categorizes as outstanding and is appropriate for the Pancasila Student Profile Reinforcement Project.

b) Large Group Trial

After completing the small group trial, the next step is to conduct feasibility testing on the large group, which is the last stage. The feasibility test by this reviewer is a limited field test that aims to get an assessment and response from a wider population regarding e-modules based on professional augmented reality media. The outcome of this experiment will serve as the basis for modifications in the final version of the product. The results of student assessment from the large group trial can be seen in Figure 6.

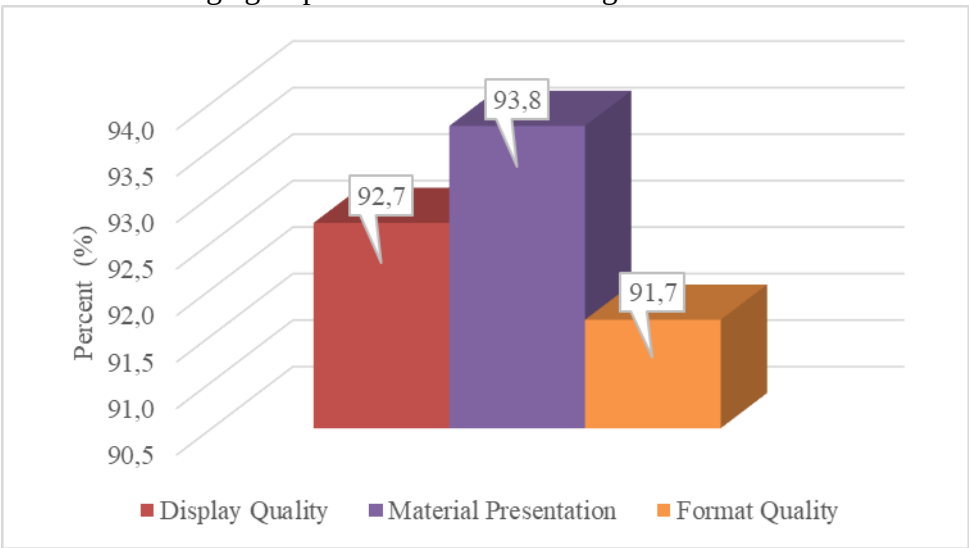

Figure 6. Results of the Large Group Test Assessment

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According to Figure 6, most of the students admired this Augmented Reality Professional Media-Based Module by showing 92.7% positive perception on display quality, 93.8% positive perception on material presentation, and 91.7% positive perception on format quality. The average score for these three aspects is 92.73%. The Module is of superior quality and fits the Pancasila Student Profile Reinforcement Project.

This fact is evident when we consider various viewpoints. The dimensions of the Pancasila Student Profile Strengthening Project are supported by AR media in the learning process, particularly through lessons oriented towards its development. Use as a learning tool, AR affects student engagement in learning; students who use AR show a higher interest in comparison with those using traditional media (Abdullah et al., 2022; Oktaviani et al., 2019). AR can engage students in learning and develop their interest in it. Also, the interest in learning is great when students are highly involved in the process of learning (Alalwan et al., 2020; Elisa & Wiratmaja, 2019).

Incorporation of AR media is increasingly trusted to develop science in accordance with the rapid progress of the digital age, based on various previous research findings. AR is valuable because of its cost-effective and simplified development process that works with quite a number of media platforms. It can be incorporated in smartphone apps or traditional printed materials like newspapers, books, and magazines (Fitria, 2023; Riskiono et al., 2020). The use of AR can be maximized through collaboration with the capabilities of technology-savvy teachers. Teachers in the digital era, both young and old, must have skills in managing or using technology, especially AR, so that teaching materials can be delivered in unique, smart, innovative, and creative ways (Seviana et al., 2023; Suh & Ahn, 2022).

The study suggests that incorporating augmented reality media into educational settings can positively impact student engagement and curiosity. The idea brings out the possibility that blending science and technology in learning will become a tool that will aid in promoting balanced growth in our educational institutions. Studies indicate a correlation between using educational media, student motivation levels as regards to learning processes and performance in academics (Sugiyati, 2016). Failure to exploit this learning media may result in students whose interest in academics keeps dwindling until they are no longer motivated to learn (Putri et al., 2019).

Conclusion

The study concludes that the media expert validation reached a percentage of 90.97%, and material experts reached 85.00%, both of which fall into the 'excellent' category. Therefore, the media was deemed suitable for use in learning. The field trial involved 60 students. The results showed that in the small group trial, the media obtained a percentage value of 90.63%, categorized as 'excellent', while in the large group trial, it obtained a percentage value of 92.73%, also categorized as 'excellent'. Based on the feasibility and effectiveness evaluations, the module is suitable and effective for use by fourth-grade students of SD Negeri Tualang Cut Aceh Tamiang. Thus, the AR-based module is an innovation that can enhance the quality of learning by making content dynamic and interactive.

Recommendation

For teachers, Augmented Reality (AR)-based digital teaching modules can be used as innovative learning media to increase motivation, conceptual understanding, and internalization of the Pancasila Student Profile values, while being integrated with active learning strategies and continuously evaluated according to class dynamics. For future researchers, research can be expanded to more schools, levels, and subjects, utilizing other

interactive technologies such as Virtual Reality (VR) or Mixed Reality (MR), and conducting longitudinal studies to examine the long-term impact on students' character and 21st-century skills.

Acknowledgment
The research team would like to thank the DIPA of the Directorate of Research and Community Service, Directorate General of Research and Development, Ministry of Higher Education, Science, and Technology in 2025 for the support of Regular Fundamental Research funds with contract number 553/UN54.6/PT.01.03/2025 for the 2025 budget year. In addition, the researcher would also like to thank the Research and Community Service Institute of Samudra University for facilitating the smooth implementation of this research.

References

Abdullah, N., Baskaran, V. L., Mustafa, Z., Ali, S. R., & Zaini, S. H. (2022). Augmented reality: The effect in students' achievement, satisfaction and interest in science education. *International Journal of Learning, Teaching and Educational Research*, *21*(5), 326–350. https://doi.org/10.26803/ijlter.21.5.17

Aditama, P. W., Adnyana, I. N. W., & Ariningsih, K. A. (2019). Augmented reality dalam multimedia pembelajaran. *SENADA (Seminar Nasional Manajemen, Desain Dan Aplikasi Bisnis Teknologi)*, *2*, 176–182.

Akyol, T., Şenol, F. B., & Yaşar, M. C. (2022). The effect of project approach-based education on children's early literacy skills. *International Journal of Contemporary Educational Research*, *9*(2), 248–258. https://doi.org/10.33200/ijcer.1024470

Al-Tabany, T. I. B. (2017). *Mendesain model pembelajaran inovatif, progresif, dan konteksual*. Prenada Media.

Alalwan, N., Cheng, L., Al-Samarraie, H., Yousef, R., Alzahrani, A. I., & Sarsam, S. M. (2020). Challenges and prospects of virtual reality and augmented reality utilization among primary school teachers: A developing country perspective. *Studies in Educational Evaluation*, *66*, 100876. https://doi.org/10.1016/j.stueduc.2020.100876

Alam, A., & Mohanty, A. (2023). Educational technology: Exploring the convergence of technology and pedagogy through mobility, interactivity, AI, and learning tools. *Cogent Engineering*, *10*(2), 2283282. https://doi.org/10.1080/23311916.2023.2283282.

Amelia, W., & Marini, A. (2022). Urgensi Model Pembelajaran Science, Technology, Engineering, Arts, and Math (STEAM) untuk Siswa Sekolah Dasar. *Jurnal Cakrawala Pendas*, *8*(1), 291–298. https://doi.org/10.31949/jcp.v8i1.1947

Arifin, B., Handayani, E. S., Yunaspi, D., Erda, R., & Dhaniswara, E. (2023). Transformasi Bahan Ajar Pendidikan Dasar Ke Arah Digital: Optimalisasi Pembelajaran Pendidikan Sekolah Dasar Di Era Teknologi Cybernetics. *Innovative: Journal Of Social Science Research*, *3*(5), 1–10. https://doi.org/10.31004/innovative.v3i5.4746

Atikah, N., Gistituati, N., Fitria, Y., & Syarifuddin, H. (2021). Validitas e-modul matematika sekolah dasar berbasis pendekatan realistic mathematics education (RME). *Jurnal Basicedu*, *5*(6), 6103–6109. https://doi.org/10.31004/basicedu.v5i6.1799

Carolina, Y. Dela. (2023). Augmented reality sebagai media pembelajaran interaktif 3D untuk meningkatkan motivasi belajar siswa digital native. *Ideguru: Jurnal Karya Ilmiah Guru*, *8*(1), 10–16.

Elisa, E., & Wiratmaja, Ig. (2019). Augmented reality: Analisis pengembangan media pembelajaran kimia untuk meningkatkan keterampilan 4C mahasiswa. *Journal of The*

Indonesian Society of Integrated Chemistry, *11*(2), 73–81. https://doi.org/10.22437/jisic.v11i2.8124

Faiza, M. N., Yani, M. T., & Suprijono, A. (2022). Efektivitas Penggunaan Media Pembelajaran IPS Berbasis Augmented Reality untuk Meningkatkan Kompetensi Pengetahuan Siswa. *Jurnal Basicedu*, *6*(5), 8686–8694. https://doi.org/10.31004/basicedu.v6i5.3901

Fajar, W. M., & Putra, E. D. (2021). Peran Guru Melalui Program Adiwiyata Dalam Mengembangkan Karakter Peduli Lingkungan di SD. *Mimbar Pgsd Undiksha*, *9*(3), 468–474. https://doi.org/10.23887/jjpgsd.v9i3.40646

Fitria, T. N. (2023). Augmented reality (AR) and virtual reality (VR) technology in education: Media of teaching and learning: A review. *International Journal of Computer and Information System (IJCIS)*, *4*(1), 14–25. https://doi.org/10.29040/ijcis.v4i1.102

Hamdi, S., Triatna, C., & Nurdin, N. (2022). Kurikulum merdeka dalam perspektif pedagogik. *SAP (Susunan Artikel Pendidikan)*, *7*(1), 10–17. https://doi.org/10.30998/sap.v7i1.13015

Irawan, L., & Yatri, I. (2022). Pengembangan Media Pembelajaran Augmented Realty pada Materi Struktur Tumbuhan Sekolah Dasar. *Ideas: Jurnal Pendidikan, Sosial, Dan Budaya*, *8*(3), 971–978. https://doi.org/10.32884/ideas.v8i3.890

Kholik, A., Bisri, H., Lathifah, Z. K., Kartakusumah, B., Maufur, M., & Prasetyo, T. (2022). Impelementasi kurikulum Merdeka Belajar Kampus Merdeka (MBKM) berdasarkan persepsi dosen dan mahasiswa. *Jurnal Basicedu*, *6*(1), 738–748. https://doi.org/10.31004/basicedu.v6i1.2045

Maghfirani, R. T., & Romelah, S. (2023). Implementasi Nilai Kebhinekaan Global Dalam Profil Pelajar Pancasila Untuk Menghadapi Krisis Identitas Nasional. *Bersatu: Jurnal Pendidikan Bhinneka Tunggal Ika*, *1*(5), 100–108. https://doi.org/10.51903/bersatu.v1i5.327

Mahmud, M., & Cempaka, M. (2022). Pengembangan E-Modul Pembelajaran Tematik Terintegrasi Profil Pelajar Pancasila Berbasis Augmented Reality (AR). *Jurnal Kajian Dan Pengembangan Umat*, *5*(2), 154–167. https://doi.org/10.31869/jkpu.v5i2.3818

Nisfa, N. L., Latiana, L., Pranoto, Y. K. S., & Diana, D. (2022). Pengaruh pendekatan pembelajaran project based learning (pjbl) terhadap kemampuan sosial dan emosi anak. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *6*(6), 5982–5995. https://doi.org/10.31004/obsesi.v6i6.3032

Nuraeni, F., & Lubis, M. (2022). Pola asuh orang tua dan implikasinya terhadap pembentukan karakter anak. *Jurnal Pendidikan Anak Usia Dini Undiksha*, *10*(1), 137–143. https://doi.org/10.23887/paud.v10i1.46054

Nurhayati, J., & Marsidin, S. (2022). Strengthening Pancasila student profiles in independent learning curriculum in elementary school. *International Journal Of Humanities Education and Social Sciences (IJHESS)*, *1*(6), 976–988. https://doi.org/10.55227/ijhess.v1i6.183

Okpatrioka, O. (2023). Research and development (R&D) penelitian yang inovatif dalam pendidikan. *Dharma Acariya Nusantara: Jurnal Pendidikan, Bahasa Dan Budaya*, *1*(1), 86–100. https://doi.org/10.47861/jdan.v1i1.154

Oktaviani, Y., Lusa, H., & Noperman, F. (2019). Pengaruh Augmented reality sebagai media pembelajaran terhadap minat belajar siswa mata pelajaran ipa sd kota bengkulu. *JURIDIKDAS: Jurnal Riset Pendidikan Dasar*, *2*(3), 202–208. https://doi.org/10.33369/juridikdas.2.3.202-208

Putri, A. E., & Hendriyani, Y. (2023). Pengembangan E-Modul Berbasis Augmented Reality Untuk Mata Pelajaran Komputer dan Jaringan Dasar Siswa Kelas X TKJ di SMK Negeri 3 Seluma. *Jurnal Vokasi Informatika*, *3*(1), 56–63. https://doi.org/10.24036/javit.v3i1.70

Putri, B. B. A., Muslim, A., & Bintaro, T. Y. (2019). Analisis faktor rendahnya minat belajar matematika siswa kelas V di SD Negeri 4 Gumiwang. *Jurnal Educatio Fkip UNMA*, *5*(2), 68–74. https://doi.org/10.31949/educatio.v5i2.14

Putri, S. D., & Syarifuddin, S. (2023). Development of Interactive E-Module on Biye Tradition to Improve Students' Learning Outcomes. *International Conference on Social Knowledge Sciences and Education (ICSKSE 2023)*, 289–302. https://doi.org/10.2991/978-2-38476-168-5_26.

Riskiono, S. D., Susanto, T., & Kristianto, K. (2020). Augmented reality sebagai Media Pembelajaran Hewan Purbakala. *Krea-TIF: Jurnal Teknik Informatika*, *8*(1), 8–18. https://doi.org/10.32832/kreatif.v8i1.3369

Salsabila, B., Akhyar, A., Setiawan, A., & Chandra, D. A. (2023). Pemanfaatan Augmented Reality (AR) sebagai Media Pembelajaran Kelas VII SMPN 1 Rambah. *Journal on Education*, *6*(1), 856–863. https://doi.org/10.31004/joe.v6i1.3002

Sari, R. K. (2021). Penelitian kepustakaan dalam penelitian pengembangan pendidikan bahasa Indonesia. *Jurnal Borneo Humaniora*, *4*(2), 60–69. https://doi.org/10.35334/borneo_humaniora.v4i2.2249

Seviana, R., Suharto, Y., Rosyida, F., & Masitoh, F. (2023). Aplikasi Volcano Berbasis Android Pada Materi Vulkanisme Sebagai Media Microlearning Geografi. *Jurnal Ilmiah Pendidikan Profesi Guru*, *6*(1), 196–208. https://doi.org/10.23887/jippg.v6i1.59506

Shalikha, P. A. A. (2022). Implementasi Projek Penguatan Profil Pelajar Pancasila Sebagai Upaya. *Jurnal Pendidikan Ekonomi*, *15*(2), 86–93. https://doi.org/10.17977/UM014v15i22022p86

Sugiyati, S. (2016). Pengaruh Media Pembelajaran dan Minat Belajar Terhadap Hasil Belajar Matematika. *Jurnal Penelitian Dan Penilaian Pendidikan*, *1*(2), 227–241. https://doi.org/10.22236/jppp.v1i2.1259

Sugiyono. (2019). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Alfabeta.

Suh, W., & Ahn, S. (2022). Utilizing the metaverse for learner-centered constructivist education in the post-pandemic era: An analysis of elementary school students. *Journal of Intelligence*, *10*(1), 17. https://doi.org/10.3390/jintelligence10010017

Sutrisno. (2021). Improvement Of Human Resources Competence With Academic Quality Policy In The Economic Sector Of Higher Education Providers In East Java. *Transformational Language, Literature, and Technology Overview in Learning (TRANSTOOL)*, *1*(1), 19–28. https://doi.org/https://doi.org/10.55047/transtool.v1i1.104

Wibowo, V. R., Putri, K. E., & Mukmin, B. A. (2022). Pengembangan media pembelajaran berbasis augmented reality pada materi penggolongan hewan kelas V sekolah dasar. *PTK: Jurnal Tindakan Kelas*, *3*(1), 58–69. https://doi.org/10.53624/ptk.v3i1.119

Yayuk, E., Restian, A., & Ekowati, D. W. (2023). Literasi numerasi dalam kerangka kurikulum merdeka berbasis art education. *International Journal of Community Service Learning*, *7*(2), 228–238. https://doi.org/10.23887/ijcsl.v7i2.56278

