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Development of Augmented Reality Learning Media Based on Assemblr Edu to Improve Students' Creativity Abilities

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Abstract: The purpose of this study is to design digital learning media that utilize Augmented Reality (AR) technology through the Assemblr Edu platform on the topic of Earth's Rotation and Revolution to enhance students' creativity. This research employed a Research and Development (R&D) method using the ADDIE model, which consists of five main stages: analysis, design, development, implementation, and evaluation. Data were collected through interviews and questionnaires administered to subject matter experts, media experts, teachers, and students. Both qualitative and quantitative techniques were used for data analysis. The validation results showed that the developed learning media achieved a feasibility score of 86% from material experts and 95% from media experts, both of which are categorized as very feasible. Meanwhile, responses from teachers and students obtained scores of 95% and 84%, respectively, classified as very good. Overall, these findings indicate that Assemblr Edu–based AR learning media are suitable for use in science learning and have strong potential to enhance students' creativity and understanding of abstract concepts.

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Introduction

The science that studies nature systematically is called natural science (IPA). Science is not limited to learning about a comprehensive understanding of various knowledge consisting of facts, and concepts but also a process of discovery (Ardhani et al., 2021). The discovery process is part of science subjects, so in science it is not only about how students gather knowledge and master the material (Miqwati et al., 2023). Science is also a subject that requires reasoning and understanding. Even so, many associate science with memorization because much of the science material is abstract (Pertiwi & Putra, 2023).

In abstract material such as rotation and the Earth's revolution, oral explanations and static images are often not able to help students understand concepts in depth. This concept is related to the movement of celestial bodies that cannot be observed directly in daily life, a more creative and modern learning medium is needed (Parmadi et al., 2023). The use of learning media with concrete visualization capabilities is part of a strategy designed to achieve the results of these goals (Hasan et al., 2021).

The use of teaching media makes it easier for teachers to deliver material by directing students to various learning activities that interact with the media. The use of relevant media that is aligned with learning objectives allows the teaching and learning process to run more effectively and produce meaningful impacts, thereby supporting the achievement of superior learning outcomes (Rini, 2024). Not only that, but learning media can make things easier,

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especially when it comes to teaching new and unfamiliar concepts to students (Nurfadhillah et al., 2021). Flexible learning media can be used in various contexts, both in face-to-face learning in the classroom and based on the surrounding environment. One form of media that is effective in stimulating student interest is digital teaching media.

Digital learning media should be used to engage students and increase effectiveness and interest during learning activities. The presence of learning media can provide different dynamics to students (Diahratri, 2022). Thus, the ideal learning media to display visualizations from abstract science subjects is digital learning media oriented to the use of technology (Tarigan et al., 2024). Along with the need for interactive digital learning media, the development of the technological era is also now experiencing a rapid increase. Along with the advancement of modern globalization, technology is undergoing rapid development, with digital technology being one of the most prominent and widely used forms (Aulia et al., 2022). Digital technology can play a role as a sophisticated learning medium, this condition facilitates students to understand abstract learning more effectively, In addition, the application of digital learning technology can stimulate students' creativity and strengthen the dynamics of interaction in the learning process (Afriyadi & Hayati, 2023).

In the realm of learning, creativity is the ability of students to satisfy their curiosity so as to produce innovative new ideas. Creativity involves thinking that is imaginative, flexible, and sometimes contrary to logic (Lestari, 2019). Indicators of students' creativity can be identified through several important aspects that describe their creative thinking abilities and innovative attitudes. First, think *fluency*, think *flexibility*, *Originality*, *Elaboration*, curiosity, confidence, expressing opinions reflect students' ability to convey their ideas spontaneously and openly (Mislah et al., 2024).

Based on the results of observations at SDN Ratujaya 3, Depok City. The learning process still lacks the function of digital media as a means of supporting digital learning. The digital learning media used is limited to *power point* (PPT), and watching videos only. And even though this school also uses concrete learning media, the use of learning media in the learning process is still lacking. In addition, the low level of creativity of students is influenced by a number of certain factors. First, students rarely bring up ideas during lessons, and during teaching-learning activities, the classroom atmosphere is sometimes not enough to support discursive interaction between students. Using learning media based on *Augmented Reality* (AR) is part of an alternative to encourage increased understanding and creativity of students.

Part of *Virtual Reality* (VR) is called *augmented reality* (AR). Technology of Augmented reality is not new in Indonesia. By combining virtual things with the real world, *augmented reality* (AR) allows users to experience the real environment. So, instead of replacing reality, *Augmented Reality* is the medium that perfects it. A better understanding of the structure of objects can be achieved by using *Augmented Reality* (AR) to present theoretical ideas in a more tangible visual format (Alfitriani et al., 2021). So it can be stated that, *Augmented Reality* (AR) is able to help the student learning process, one of which is as a prop for the introduction of the Rotation and Earth Revolution events (Sacra et al., 2022).

One of the media to teach technology *Augmented Reality* that allow direct application in learning, namely *Assemblr Edu*, the app can display *Augmented Reality* (AR) provides an opportunity for students to observe and engage with each other directly along with the 3D models of Earth's Rotation and Revolution displayed (N. A. Saputra et al., 2025). Clear visualization can help students understand the Earth's movements and their impacts, such as day and night and the change of seasons. Assemblr Edu provides 3D model creation features

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that teachers and students can access. Supported by Augmented Reality (AR) technology, this platform presents material interactively through visual illustrations and attractive 3D animations, thus encouraging students' exploration and creativity (Chairudin et al., 2023). This application can help teachers to train curiosity so that students can increase creativity in processing 3D materials according to understanding so that learning becomes fun and improves the quality of meaningful learning experiences (Rini, 2024).

Based on the above problems, this research intends to develop *Augmented Reality* (AR) digital teaching media based on *Assemblr Edu* to increase student creativity. It is hoped that the research on the development of digital learning media can train students' creativity and can make it easier for students to know abstract learning materials, such as Rotation and Earth Revolution materials.

Research Methods

This research method used Research and Development (RnD) with the ADDIE model which includes five main stages: analysis, design, development, implementation, and evaluation (October, 2023). This research focuses on the use of Augmented Reality (AR)-based Assemblr Edu learning media with Earth rotation and revolution materials, which were piloted on grade VI elementary school students. This media contains learning objectives, interesting illustrations, and explanations of the processes, impacts, and differences in rotation and revolution of the Earth in one interactive unit. The presence of this media is expected to facilitate student understanding while creating an active and fun learning environment.

The data in this study was obtained through interviews and evaluation of the quality of the material by the validators for a qualitative approach. Meanwhile, the quantitative approach used response questionnaires from teachers and students, as well as validation instruments from media and material experts. The measurement tools were in the form of validation questionnaires and participant response questionnaires (Legina & Sari, 2022). The measurement scale used in the questionnaire is the scale *Likert* Five points with a list format *Checklist.* The results of the findings resulting from the validation and the respondents were then analyzed through the following formula. (Nurjannah, 2019):

$$P = \frac{\Sigma x}{\Sigma x\, maks} \times 100\%$$

Information:

P = Percentage score
$\sum x$ = Number of validation scores
$\sum x\, max$ = Maximum number of validation scores

Based on the results of the calculation using the formula described earlier, the level of media feasibility *Assemblr Edu* obtained through validation of material experts and media experts, with assessments including material suitability, clarity of presentation, visual appearance, ease of use, and integration of components. The results of the data processing showed that the media met the eligibility criteria and was ready to be used in learning. The eligibility percentage is shown in the following table.

Table 1. Eligibility Scale

Achievement Rate (%)	Category
81%-100%	Highly feasible
61%-80%	Proper
41%-60%	Enough

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21%-40%	Less worthy
0%-20%	Very unworthy

Source: Modified from (Sari & Dwi, 2022)

After validating the feasibility of *Assemblr Edu* media based on evaluations obtained from experts who act as validators, the researcher also determined the feasibility level of the developed media based on the percentage of assessment by referring to responses from educators and students. Below is a table of percentages and product feasibility:

Table 2. Eligibility Scale

Achievement Rate (%)	Category
81%-100%	Excellent
61%-80%	Good
41%-60%	Enough
21%-40%	Less good
0%-20%	Very bad

Source: (W. Saputra, 2022)

Research and Discussion

Stages of Analysis

The first step in this development is the analysis stage, which is focused on the review of learning outcomes by researchers to be adjusted in teaching media. The analysis is carried out through direct observation of the characteristics of students, educators, and the designed teaching materials. The results of observations at SDN Ratujaya 3 show that educators need innovative digital media to facilitate the delivery of abstract concepts. Meanwhile, students show a high interest in technology, but easily get bored with monotonous learning methods. Therefore, technology-based media such as Augmented Reality (AR) is a necessity, as it is able to visualize concepts in 3D and allow students to actively interact with the material. Through this medium, students not only receive knowledge, but are also encouraged to explore and develop their creativity.

Design Stage

The second stage that is carried out after analyzing is to make a design of the learning media. In carrying out this design process, the researcher will formulate important elements that must be included in the developed learning media. These processes include; 1) Determine the learning material, 2) Design the storyline on the material presented, 3) Collect images, videos, that are relevant in displaying 3D objects, 4) Account Registration, Visit *Assemblr World*, 5) After registration, Log in to *Assemblr Studio*, then log in to your account and access *the Assemblr Studio* dashboard, 5) Start Project: Click the plus sign (+) on the dashboard to start a new project, 6) Add Content, Select the "3D *Object*" menu to add 3D objects from the available categories, 7) Create AR Content, upload a custom marker design that will be used as a trigger to display the AR object in the app, 8) Save and Share the Project, 8) Create an Edu *Assemblr usage guide*

Development Stage

The third stage is the product development stage, where the designed learning media is available in real form and accessible to users. At this stage, validation is carried out by two parties, namely material experts (science lecturers) and media experts (learning media lecturers). The validation results generate input in the form of suggestions and criticism that are used to revise the media to make it more suitable for use in the next stage of

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implementation. The results of the development of Augmented Reality (AR)-based teaching media using *Assemblr Edu* are shown in the following visual:

Figure 1. Initial Parts

Figure 2. Instructions Screen

Figure 3. Material

Figure 4. Material

Figure 5. Quiz

Figure 6. Practice Questions

Figure 7. Material

Figure 8. Quiz

Assemblr Edu's *Augmented Reality* (AR) teaching *media* designed to support students' creativity enhancement can be accessed through the following links and QR codes:
https://asblr.com/oMF40I

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Figure 9. Media *Barcode* Code

Furthermore, the media products that have been designed are validated by two experts, namely media experts and material experts. Validation was carried out through an assessment questionnaire equipped with the presentation of Assemblr Edu-based AR media to be examined and evaluated. The validation results are presented in the following Tables 3 and 4:

Table 3. Material Expert Validation Test Data

Aspects	Achievement Rate (%)	Category
Curriculum	90%	Highly feasible
Material	87%	Highly feasible
Effectiveness of Use	88%	Highly feasible
Creativeness	80%	Highly feasible
Average	**86%**	**Highly feasible**

Based on the results of the evaluation by material experts, the assessment covers four aspects: curriculum (90%), material (87%), effectiveness of use (88%), and creativity (80%), all of which are included in the classification of very feasible. The overall average percentage is 86%, indicating that learning media is very feasible to use.

Table 4. Media Expert Validation Test Data

Aspects	Achievement Rate (%)	Category
Feasibility	100%	Highly feasible
Design	96%	Highly feasible
Effectiveness of Use	92%	Highly feasible
Creativeness	93%	Highly feasible
Average	**95%**	**Highly feasible**

Based on the results of validation by media experts, the assessment was carried out on four main aspects. The feasibility aspect obtained a percentage of 100%, display design 96%, effectiveness of use 92%, and creativity of 93%—all of which are included in the very feasible classification. The overall average of the four aspects shows a percentage of 95%, which confirms that this learning medium is declared very feasible to use.

Implementation Stage

The fourth stage is the application or trial of the product. Products that have been designed by researchers have gone through validation and rearrangement steps, so it is feasible to carry out teaching media simulations with educators and students. With the aim of getting a response that will be used as material for the evaluation of learning media. The results of the responses presented below illustrate the results of the response to the assessment questionnaire of educators and students, described in tables 5 and 6 below:

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Table 5. Educator Response Data

Aspects	Achievement Rate (%)	Category
Curriculum	90%	Excellent
Material	93%	Excellent
Ease of Use	100%	Excellent
Creativeness	96%	Excellent
Average	**95%**	**Excellent**

Based on educators' assessment of *Assemblr Edu-based* AR media, very good results were obtained in all aspects: curriculum (90%), material (93%), ease of use (100%), and creativity (96%). The overall average reaches 95%, indicating that this medium is very suitable for use in learning.

Table 6. Student Response Data

Aspects	Achievement Rate (%)	Category
Design	87%	Excellent
Material	82%	Excellent
Ease of Use	85%	Excellent
Average	**84%**	**Excellent**

Based on the results of the responses of grade VI students, Assemblr Edu-based AR media obtained excellent ratings on the aspects of design (87%), materials (82%), and ease of use (85%). These results show that the media is suitable for use in learning to support the development of students' creativity.

Evaluation Stage

At this stage, it will be known whether this learning media is as expected or not. Researchers can also find out the advantages and weaknesses, and researchers can find out the functional and pedagogical feasibility of the learning media. In order to identify the results of the evaluation process, the researcher can refine the product developed, while still adhering to the original goal of creating the media *Assemblr Edu* one, one of which is by including the *Pre-test*. The following is the assessment data *Pre-test* in Table 7.

Table 7. *Pre-Test Assessment Data*

Indicators of Creativity Questions	Question No.	Average Presentation
Explain day and night in your own language.	1	59%
Explain the rotation of the Earth with the time difference in Indonesia.	2	85%
Explaining the relationship between revolution and seasons through imaginative stories	3	62%
Creating stories from Earth's perspective about time differences	4	62%
Write imaginative stories as a rotating Earth	5	64%
Create a simple learning plan about rotation	6	65%
Writing an imaginative dialogue between the Earth and the Sun about the seasons	7	59%
Overall Average		**64%**

The pre-test results obtained from 31 students showed an average achievement of 64%, which is still quite low. Therefore, the researcher uses *Assemblr Edu* learning media as an effort to increase student creativity. After the use of the media, the researcher continued by giving a post-test to the same student. The data derived from the post-test are compiled in the form of Table 8.

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Table 8. Post-Test Assessment Data

Indicators of Creativity Questions	Question No.	Average Presentation
Explain day and night in your own language.	1	84%
Explain the rotation of the Earth with the time difference in Indonesia.	2	100%
Explaining the relationship between revolution and seasons through imaginative stories	3	85%
Creating stories from Earth's perspective about time differences	4	80%
Write imaginative stories as a rotating Earth	5	86%
Create a simple learning plan about rotation	6	81%
Writing an imaginative dialogue between the Earth and the Sun about the seasons	7	84%
Overall Average		**85%**

From the previous data, the post-test results of 31 students showed an average of 85%, a significant increase compared to the pre-test which only reached 64%. This increase of 21% indicates that the use of *Assemblr Edu* media is effective in increasing student creativity and is suitable for use as a tool in the learning process.

Discussion

Based on the results of the completed study, the teaching media *Augmented Reality* (AR) based *Assemblr Edu* In increasing students' creativity in the material, rotation and the earth revolution have been successfully designed. Results of Table 3. Validation carried out by material experts shows a feasibility level of 86%, which is considered very feasible. The assessment includes curriculum suitability, material completeness, effectiveness of use, and elements of creativity, with high results in all aspects. This indicates that the material is compiled systematically, relevant, and supports the achievement of learning objectives. These findings are in line with the opinion that the selection of media that is appropriate to the curriculum can significantly improve basic competencies and student learning outcomes (Septiana et al., 2022).

Based on the validation of media experts Table 4. Learning media obtained a feasibility percentage of 95% and was categorized as very feasible. The assessment includes aspects of media feasibility, display design, effectiveness of use, and creativity. The maximum score on the feasibility aspect shows that the media meets functional and technical standards. In terms of design, media is considered attractive, easy to navigate, and effective to use by teachers and students. The element of creativity is also highly rated because it is able to present an innovative learning experience. These findings are in line with the opinion that AR-based *Assemblr Edu* It received a positive response because it was attractive, easy to operate, and practically accessible via digital devices (Primadona et al., 2024).

Based on the responses of educators (Table 5), AR learning media is based on *Assemblr Edu* obtained an average feasibility of 95%, which is very good. The assessment includes curriculum suitability, material completeness, ease of use, and elements of creativity. The curriculum and material aspects show alignment with learning standards, while the ease of use obtains maximum scores, indicating the practicality of the media in the classroom context. The element of creativity is also highly valued because it is able to present an interesting and innovative learning experience. These results reinforce previous validation

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that these media are not only technically and content-worthy, but also relevant and applicable to learning (Salmilah & Hisbullah, 2024).

Meanwhile, in table 6. Response of grade VI students to the media *Augmented Reality* (AR) based *Assemblr Edu* also showed positive findings. The design aspect scored 87%, material 82%, and ease of use 85%, all of which were in the classification Very good with a percentage of 84%**.** This achievement shows that the media has succeeded in attracting students' interest, is easy to use, and is able to present material in a more interesting and interactive way. Thus, this learning facility is stated to be ready to be implemented as a media to support the learning process that supports the development of students' creativity. In line with the opinion that *Augmented Reality* (AR) based *Assemblr Edu* also produce a positive impact for students in increasing creativity, *Augmented Reality* (AR) based *Assemblr Edu* has great potential in improving students' experience in science learning (Tuhuteru et al., 2021).

Based on the results of the evaluation, the researcher refined the learning media *Assemblr Edu* while still referring to the initial goal of its development, one of which is through the provision of questions *Pre-test*. From *Pre-test* which was attended by 31 students, obtained an average score of 64%, which shows a relatively low level of achievement. After intervention using the media *Assemblr Edu* Done *Post-test* in the same student, and the results showed a significant improvement with an average of 85%. The difference in the increase of 21% indicates that the media *Assemblr Edu* effectively applied as an instrument to support the learning process in encouraging and increasing student creativity in the material provided.

Augmented Reality (AR) technology in learning media such as Assemblr Edu offers an interactive learning experience through the visualization of abstract concepts into real, easy-to-understand forms. This feature increases student engagement and makes learning more enjoyable. In addition to its user-friendly interface, Assemblr Edu allows for content flexibility without requiring high technical expertise. However, challenges such as the need for dedicated devices, stable internet connections, and subscription fees are still obstacles. However, with adequate infrastructure support, this platform has great potential in driving learning innovation. In line with opinion that *Augmented Reality* (AR) is able to help the student learning process, one of which is as a prop for the introduction of abstract Earth Rotation and Revolution events (Sacra et al., 2022).

In line with previous studies that have been applied in previous research (Purnama Sari et al., 2024) In research on Augmented Reality (AR), it was found that this technology has a positive impact on students' interest in receiving subject matter. The use of AR has been proven to increase student participation, provide visual and sensory stimulation, and encourage their motivation to learn more optimally. *Augmented Reality* (AR) based *Assemblr Edu* also has a positive impact on students in increasing creativity, *Augmented Reality* (AR) based *Assemblr Edu* has great potential in improving students' experience in science learning (Tuhuteru et al., 2021).

The development of Assemblr Edu learning media was developed as a fun learning alternative for grade VI students at SDN Ratujaya 3. During the implementation process, despite obstacles such as internet connection and device limitations, the results of the trial showed that this media was effective in increasing students' creativity in understanding the material of rotation and the Earth's revolution.

Conclusion

Teaching media developed with *Augmented Reality* (AR) technology through *the Assemblr Edu* platform shows its effectiveness in increasing students' creativity on rotation

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and earth revolution materials. This is supported by the increase in student achievement from pre-test to post-test with a difference of 21%, as well as validation by material and media experts who show high feasibility, namely 86% and 95%, respectively. Positive responses from educators and students, with an average of 95% and 84%, also strengthen that this media not only meets the feasibility in terms of technical and content, but is also interesting and easy to use. Thus, *Assemblr Edu* is worthy of being applied as an innovative learning medium in the classroom.

Recommendations

For the sake of optimizing the implementation of this media, it is recommended that teachers not only focus on the use of technology, but also manage classroom dynamics to be more conducive and collaborative. Teachers can design project-based learning activities or AR-supported group discussions to spark creative interaction between students.

In addition, this study still has opportunities to be further developed with a more diverse scope, covering various levels of education, variations of subject matter, or duration of media use, in order to gain a more comprehensive understanding of the influence of AR media on increasing creativity and other student competencies.

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References

Afriyadi, H., & Hayati, N. (2023). *Media Pembelajaran Berbasis Digital*.

Alfitriani, N., Maula, W. A., & Hadiapurwa, A. (2021). Penggunaan Media Augmented Reality dalam Pembelajaran Mengenal Bentuk Rupa Bumi. *Jurnal Penelitian Pendidikan*, *38*(1), 30–38. https://doi.org/10.15294/jpp.v38i1.30698

Ardhani, A. D., Ilhamdi, M. L., & Istiningsih, S. (2021). Pengembangan Media Pembelajaran Berbasis Permainan Monopoli pada Pelajaran IPA. *Jurnal Pijar Mipa*, *16*(2), 170–175. https://doi.org/10.29303/jpm.v16i2.2446

Aulia, T. U., Bandarsyah, D., & Sulaeman, S. (2022). Dampak Game Mobile Legends Terhadap Pola Interaksi Sosial Siswa Kelas V di Sekolah Dasar. *Jurnal Educatio FKIP UNMA*, *8*(3), 899–907. https://doi.org/10.31949/educatio.v8i3.2710

Chairudin, M., Nurhanifah, N., Yustianingsih, T., Aidah, Z., Atoillah, A., & Sofian Hadi, M. (2023). Studi Literatur Pemanfaatan Aplikasi ASSEMBLR EDU Sebagai Media Pembelajaran Matematika Jenjang SMP/MTS. *Communnity Development Journal*, *4*(2), 1312–1318. https://id.edu.assemblrworld.com/

Diahratri, K. (2022). Efektivitas Penggunaan Youtube Sebagai Media Belajar Mahasiswa Program Studi Pendidikan Informatika STKIP PGRI Pacitan. Skripsi. Pacitan. *Khusnul Diahratri.2022*, *5*(3), 248–253.

Hasan, M., Milawati, Darodjat, Khairani, H., & Tahrim, T. (2021). Media Pembelajaran. In *Tahta Media Group*.

Legina, N., & Sari, P. M. (2022). Pengembangan Media Pembelajaran Interaktif Articulate Storyline Berbasis Keterampilan Berpikir Kritis pada Pembelajaran IPA bagi Siswa Sekolah Dasar. *Jurnal Paedagogy*, *9*(3), 375. https://doi.org/10.33394/jp.v9i3.5285

Lestari, I. (2019). *Kreativitas dalam Konteks Pembelajaran* (Issue August).

Miqwati, M., Susilowati, E., & Moonik, J. (2023). Implementasi Pembelajaran Berdiferensiasi Untuk Meningkatkan Hasil Belajar Ilmu Pengetahuan Alam Di Sekolah Dasar. *Pena Anda: Jurnal Pendidikan Sekolah Dasar*, *1*(1), 30–38. https://doi.org/10.33830/penaanda.v1i1.4997

Mislah, M., Hayat, M. S., & Siswanto, J. (2024). Profil Kreativitas dan Keterampilan Berpikir Kritis Siswa dalam Pembelajaran Fisika di Madrasah Aliyah. *Edukatif : Jurnal Ilmu Pendidikan*, *6*(4), 4066–4077. https://doi.org/10.31004/edukatif.v6i4.7288

Mukaromah, D. W. I. S., Studi, P., Matematika, T., Tadris, J., Tarbiyah, F., Ilmu, D. A. N., Negeri, U. I., Kiai, P., Saifuddin, H., & Purwokerto, Z. (2025). *Pengembangan Media Pembelajaran Matematika Berbasis Augmented Reality Menggunakan Assemblr Edu Untuk Meningkatkan Kemampuan*.

Nurfadhillah, S., Ningsih, D. A., Ramadhania, P. R., & Sifa, U. N. (2021). Peranan Media Pembelajaran Dalam Meningkatkan Minat Belajar Siswa SD Negeri Kohod III. *PENSA : Jurnal Pendidikan Dan Ilmu Sosial*, *3*(2), 243–255. https://ejournal.stitpn.ac.id/index.php/pensa

Nurjannah, F. (2019). *Pengembangan penelitian*. 34–47.

Okpatrioka. (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

Parmadi, T., Nurcahyo, M. A., & Listiarini, Y. (2023). Pengembangan Media Miniatur Sistem Tata Surya 3D terhadap Pengenalan Sistem Tata Surya Kelas VI SD. *Jurnal Edukasi*, *1*(3), 255–270. https://doi.org/10.60132/edu.v1i3.174

Pertiwi, D. L., & Putra, L. D. (2023). Pengembangan Media Pembelajaran Video Animasi Interaktif Materi Fotosintesis Kelas Iv Di Sekolah Dasar. *Pendas : Jurnal Ilmiah Pendidikan Dasar*, *08*(3), 3334–3346.

Primadona, I., Zakir, S., Efriyanti, L., & Jasmienti, J. (2024). Perancangan Media Pembelajaran Berbasis Augmented Reality (AR) Menggunakan Assemblr Edu Pada Mata Pelajaran Biologi Di MAN 4 Agam. *Education Achievement: Journal of Science and Research*, *5*(3), 907–923. https://doi.org/10.51178/jsr.v5i3.2099

Purnama Sari, U., Mayadiana Suwarma, D., Endrawati Subroto, D., Putu Agus Dharma Hita, I., Studi PGMI, P., Tarbiyah, F., Al-Quraniyah Manna, S., Mulia, P., Ps Manna, K., & Bengkulu Selatan, K. (2024). Pengaruh Pemanfaatan Teknologi Augmented Reality terhadap Tingkat Ketertarikan Belajar Siswa dalam Penyampaian Materi Pembelajaran. *Journal on Education*, *06*(03), 17672–17679.

Rahayu, F. (2022). Pengembangan Kreativitas Anak Melalui Startegi 4P (Person, Press, Process, Product). *Jurnal Ilmiah Mandala Education*, *8*(3), 2406–2414. https://doi.org/10.58258/jime.v8i3.3779

Rini. (2024). Pelatihan Pembuatan Media Pembelajaran Interaktif Menggunakan Assemblr Edu (AR) Dalam Mendukung Kegiatan Pembelajaran Bagi Guru SMK. *Gudang Jurnal Pengabdian Masyarakat*, *2*(1), 36–40. https://gudangjurnal.com/index.php/gjpm/article/view/283%0Ahttps://gudangjurnal.com/index.php/gjpm/article/download/283/277

Sacra, S., Sains, J., Kasus, S., Belajar, B., Hatiku, B., Solear, K., & Tangerang, K. (2022). *Penerapan Metode Marker Based Tracking Augmented Reality Sebagai Media Pembelajaran Pengenalan Tata Surya*. *2*(4).

Vol. 12 No. 4 : October 2025
E-ISSN: 2722-4627
pp. 1301-1312

Salmilah, S., & Hisbullah, H. (2024). Optimalisasi Pembelajaran Kurikulum Merdeka di Madrasah Melalui Pemanfaatan Media Digital. *Jurnal Pengabdian Literasi Digital Indonesia*, *3*(2), 80–88. https://doi.org/10.57119/abdimas.v3i2.124

Saputra, N. A., Avrillia, D., Cristofel, J., Informatika, T., Teknik, F., Nusantara, U., & Kediri, P. (2025). *Penerapan Augmented Reality dalam Pembelajaran Visualisasi Planet Bumi bagi Siswa MI Miftahush Shibyan*. *4*, 526–531.

Saputra, W. (2022). *pengembangan media pembelajaran trainer sistem bahan bakar diesel tipe in-line*. *1*(1), 40–49.

Sari, P. M., & Dwi, S. (2022). *Pengembangan Media Pembelajaran Video Animasi Berbasis Keterampilan Proses Sains Pada Pembelajaran Ipa*. *5*, 316–323.

Septiana, I. G. Y., Wibawa, I. M. C., & Trisna, G. A. P. S. (2022). Interactive Multimedia Based on Articulate Storylines in the Topic of Plant Anatomy and Physiology. In *International Journal of Elementary Education: Vol. 6 (2)*.

Tarigan, E. D. P. B., Gultom, M., Lubis, S. L. G., & Khairunnisa. (2024). Penerapan Media Pembelajaran Berbasis Digital Pada Mata Pelajaran IPA di SD Negeri 060877 Medan Perjuangan. *Fonologi : Jurnal Ilmuan Bahasa Dan Sastra Inggris*, *2*(2), 237–246. https://doi.org/10.61132/fonologi.v2i2.746

Tuhuteru, S., Kaiwai, O., Douw, L., Oni, W., Willi, F., Agapa, R., Kogoya, I., Mabel, R., Karoba, M., & Tabuni, I. (2021). PkM Pemanfaatan Teknologi Augmented Reality untuk Meningkatkan Kreativitas Media Ajar IPA. *Abdimas Indonesia*, *1*(2), 26–32. https://dmi-journals.org/jai/article/view/226

Waruwu, M. (2024). Metode Penelitian dan Pengembangan (R&D): Konsep, Jenis, Tahapan dan Kelebihan. *Jurnal Ilmiah Profesi Pendidikan*, *9*(2), 1220–1230. https://doi.org/10.29303/jipp.v9i2.2141