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Development of Assemblr-Edu Based Learning Media with RADEC Learning Model on Implementation of P5 in Elementary School

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Abstract: This research aims to develop Assemblr Edu learning media with the RADEC learning model for implementing the Pancasila Student Profile Strengthening Project (P5) in Elementary Schools. This research used the R&D (Research and Development) method with the 4D model. The research subjects consisted of material validators, media validators and 58 students. The data collection instrument used in this research was a questionnaire which was then analyzed descriptively qualitative and quantitative. The results of this study indicated that Assemblr Edu learning media based on the results of material validation obtained 97% with a very feasible category, and the results of media validation obtained 92% with a very feasible category. Educators could apply the results of the Assemblr Edu learning media development in implementing P5 with the RADEC learning model in elementary schools. This research makes a significant contribution to the education field, especially in utilizing Assemblr Edu technology and the RADEC learning model in elementary schools. In practice, it can enrich the literature on technology-based learning and educational innovation to improve the quality of high-quality learning.

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Introduction

Learning media is an alternative to an educator in delivering material, increasing the creativity of students and then increasing the attention of students during the learning process. Educators can utilize technological advances to create innovative learning, especially in implementing the Pancasila Student Profile Strengthening Project (P5). Technology-based learning media is an interesting thing to discuss today. Technology-based media is very helpful for students and educators in supporting success in education. Technological developments greatly help educators (Ghani et al., 2022). So, with the development of technology, educators can innovate in making learning media, such as the use of technology-based learning media.

Along with the times, education will be more advanced and more knowledge will be obtained so that the curriculum will continue to change from time to time to improve the quality of education, including in Indonesia. The curriculum is the most important part of the education process to achieve a goal in education. Using the Merdeka curriculum, a project-based curriculum to develop soft skills in accordance with the profile of Pancasila students (Sari, 2022). The Merdeka Curriculum aims to answer educational challenges and support students' abilities to communicate, collaborate, think critically, and solve problems. (Aulia et al., 2023). Through the project of the Merdeka curriculum students can develop their talents and skills through the Merdeka curriculum program, namely the Pancasila Student Profile Strengthening Project (P5) (Pratiwi et al., 2023). The Pancasila Student Profile Strengthening

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Project (P5) is one of the flagship programs of the Merdeka curriculum. The implementation of P5 will realize the strengthening of the Pancasila Learner Profile character towards students through project-based learning. (Ulandari & Dwi, 2023) (Vogelzang & Admiraal, 2017). The Pancasila Learner, Profile Strengthening Project, has themes such as local wisdom, sustainable lifestyle, Bhineka Tunggal Ika, building the soul and body, engineering and technology, and entrepreneurship. (Arifin, 2023; Maulida, 2023).

Things that need to be considered in learning educators must pay attention to the learning model that will be used during learning, especially in applying P5. There are many learning models, so educators must be able to choose the right learning model to achieve the expected competencies of each student. RADEC is one of the learning models that can be applied in the Merdeka curriculum. According to (Sopandi, 2017) As the inventor of the RADEC learning model, I believe it is suitable for the current conditions because it is the latest breakthrough in education for 21st-century achievement, character, and literacy. (Fatayan et al., 2023).

The RADEC learning model has 5 syntaxes: read, answer, discuss, explain, and create (Pratama et al., 2019). In the read stage, learners will read information from their sources; learners will be guided in understanding the information obtained with questions asked by educators during pre-learning. The answer stage is the second stage; learners will answer pre-learning questions based on the results of the information they get. Stage discussion or discussion: in this third stage, learners discuss in groups and discuss related topics. Stage explain or explain: at this stage, learners are asked to explain the results of their discussion. The last stage is the create stage; in this stage, the educator facilitates and guides learners to use the knowledge they have mastered to create creative ideas or thoughts. (Fuziani et al., 2021).

Before implementing the RADEC learning model in the classroom, it is important to consider the advantages and disadvantages of the learning model. The main advantage of the RADEC learning model is that the steps make it easy for students to understand the learning that takes place and improve their cognitive abilities. The RADEC learning model also provides opportunities for learners. In the discussion stage, the RADEC learning model also provides opportunities for learners to understand the material better and improve their communication skills. (Amar, 2022; Ramadhani, 2021). In addition to RADEC's advantages, this learning model has disadvantages, namely that it is more specific to story problems (Iwanda et al., 2022).

Based on observations and interviews with driving teachers, basically, every school implementing P5 has varied but still uses media that is less interesting for students; this causes a lack of student focus during learning. In addition, the selection of learning models is less considered by teachers in schools. Teachers still use learning models based on their own experience or Self Directed Learning, so it is not suitable in implementing P5 because not all students have the same experience. The limitation of media and the selection of an inappropriate learning model resulted in students not being interested when the application of P5 took place so the application of P5 was said to be unsuccessful. Therefore, to overcome the above problems, the development of learning media and the selection of the right learning model are needed to overcome problems during the learning process is important.

Assemblr Edu learning media is a technology that can realize 3D virtual objects in real-world form, provide collaborative learning, and improve skills among learners and educators. Therefore Assemblr Edu AR-based media is very suitable for any learning, especially in the application of P5. (Carrión et al., 2023; Kleco & Elementary, 2023)..

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Assemblr Edu is a platform that has the advantage of combining online class, 3D and Augmented Reality. The animations in Assemblr Edu are available for free and the features are very interesting to be used in making learning media. This makes Assemblr Edu look superior because there are still many platforms that do not provide free features. (Arulampalam Kunaraj, P.Chelvanathan, Ahmad AA Bakar, 2023).

Assemblr Edu development research that has been researched by (Suhati et al., 2023) shows that Assemblr Edu-assisted learning media is said to be effective and can be used as a supporting tool in the learning process. The results of further research (Hasanah, 2022) stated that Assemblr Edu learning media can stimulate students' interest in learning to be more independent, and students' reasoning is more focused and more competent. Assemblr Edu media fulfils the demands of the advancement of the education era, especially in utilizing the technology media field. Other research results (Putu Rissa Putri Intari Dewi et al., 2022) stated that learning using Assemblr Edu increased learning activities in the classroom, and learning became more relevant. Assemblr Edu media can significantly increase students' interest in learning, as stated by (Lestari et al., 2023). That is because creative learning maximizes the learning process and learning objectives. Learners become more enthusiastic when learning takes place. This research aims to develop interactive learning media in the form of 3D and Augmented Reality based on Assemblr Edu for students applying P5 in elementary schools with the RADEC learning model, especially on Sustainable Lifestyle material. The presence of 3D and Augmented Reality media is expected to help students understand the material easily, increase their focus during learning, and be highly interested in learning, especially in the application of P5.

Research Method

The research and development method was used in this research. According to Sugiyono (in Edwar et al., 2021) *Research and Development* (R&D) is a method used to produce a product and test its effectiveness. The development model of this research was the 4D model (*Define, Design, Development, Disseminate*) (Optik, 2018). In the first step of the research, this model analyzed the needs to determine the appropriate learning product to use. Then, the product to be realized was designed according to the needs, then developed, and then tested so that the resulting product can help the learning process in the classroom, after which the product was tested for validity, the product was tested for validity by media experts and material experts. After the product had been tested for validity and was said to be feasible, the product was disseminated for use in learning.

The subjects in this study were fourth grade students from schools in Jakarta City that have implemented Merdeka Curriculum in the 2023/2024 school year. In each school, 30 students were represented for School A and 28 for School B, so that the total number of participants was 58 students. This research data analysis technique used qualitative and quantitative descriptive analysis. Quantitative data is in the form of assessment data about learning media from material experts, media experts, and students, while qualitative data is in the form of input and suggestions from media experts and material experts. Experts used a Likert scale to validate the data. The following Likert scale is shown in Table 1.

Table 1. Questionnaire Assessment Criteria

Category	Score
Satisfied	3
Simply	2
Not Satisfied	1

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Furthermore, the results of validation research and field trials are calculated in the following way:

$$\text{Interpretation} = \frac{Skor\ perolehan\ data}{Skor\ maksimum}\ x\ 100\%$$

After calculating the score interpretation, it will get a percentage result on the quality of the product developed. The limits of the assessment of the accuracy and suitability of Assemblr Edu media development to be used as learning media are based on Table 2:

Table 2. Feasibility Scale for Assemblr Edu Media Development

Percentage Range	Criteria
0% - 20%	Not Feasible
21% - 40%	Less Feasible
41% - 60%	Decent Enough
61% - 80%	Worth
81% - 100%	Very Feasible

(Saski & Sudarwanto, 2021)

Results and Discussion

The product produced in this development research is Assemblr Edu learning media. This learning media was tested to obtain product validation from material experts and media experts as well as to measure and see responses from students to the media developed. The following display of Assemblr Edu learning media can be seen in Figure 1.

Figure 1. Assemblr Edu Media Development Results

This research uses the 4D development model as a stage in the Assemblr Edu learning media development process. The 4D process consists of 4 stages, namely:

1) **Define**

Define stage is the first step that must be taken before developing learning media. The purpose of this stage is to determine and define the learning requirements. This stage begins with a learner needs analysis, learner analysis is an examination of learner characteristics such as skills, background knowledge, and the level of cognitive development of learners. The analysis results are used as a frame of reference for preparing learning materials later. Furthermore, curriculum analysis aims to identify various problematic student competencies in the learning process. The Curriculum analysis examines the curriculum's various core and basic competencies, namely the Merdeka Curriculum. Furthermore, concept analysis is carried out, this analysis aims to identify, detail, and systematically arrange the relevant parts that students will

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learn—furthermore, formulating the learning objectives needed in product development analysis.

2) Design

The Design stage in the 4D development research model is a systematic process that starts with designing the concept and content of the product. At this stage, researchers started by making design concepts for making media with Assemblr Edu. Researchers selected the media format to design the content of learning media tailored to learning and the Merdeka curriculum used. The selected media development format includes all the learning objectives of the Sustainable Lifestyle material in implementing the Pancasila Student Profile Strengthening Project (P5) which is loaded into Assemblr Edu to make it easier for students in the learning process.

Figure 2. Cover

Figure 2 is the initial appearance (cover) of the media developed by researchers. This display explains the meaning of " Sustainable Lifestyle " and "Waste" in learning materials.

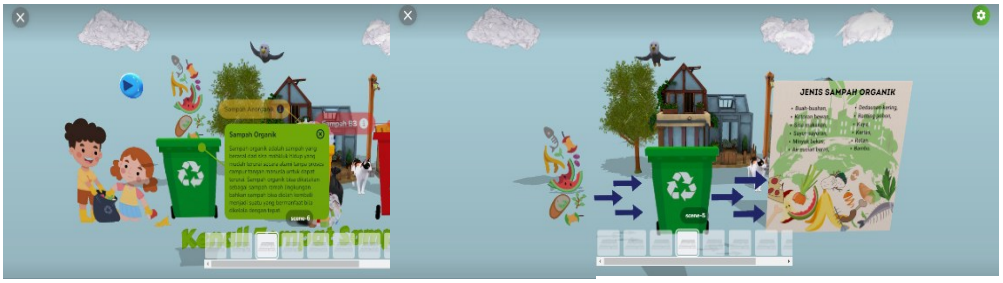

Figure 3. Assemblr Edu Content

Figure 3 is the content section of the media developed by the researcher. This media displays diverse content. In Figure 4, the researcher provides an explanation for each element or animation presented. This aims to help users understand the meaning of the elements designed by researchers.

Figure 4. Cover

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Figure 4 displays the closing section of the media developed by the researcher. The display is designed according to the theme "Sustainable Lifestyle".

3) Development

During this stage, the researcher assesses the designed product to ensure it is innovative and ready for implementation. Validity tests are conducted to achieve this and revisions are made if necessary. Development tests and effectiveness tests are also conducted to ensure the product meets the required standards. After the product is declared valid, then proceed to the next stage. The validation of Assemblr Edu learning media is assessed through feasibility instruments given to material and media experts. These experts provided assessments, comments, and suggestions on the validation sheet used by researchers to develop the product. The results of the validators became a reference for improving media development. The results of the material and media expert assessment are in Table 3.

Table 3. Feasibility Results of Assemblr Edu Media

Validator	Score Acquisition	Maximum Score	Average Percentage
Media	39	42	92%
Material	35	36	97%
Total		**90%**	
Qualifications		**Very Feasible**	

Based on Table 3, the average media expert score is 90% and the average material expert score is 97%. This shows that the media developed achieved very high criteria, making it very feasible to use. The material expert assessment aims to collect material experts' opinions to improve the content presented in the learning media. Evaluation from media experts aims to determine the suitability of the media developed and will later disseminate the results. Based on the results of the experts' assessment, Assemblr Edu learning media is considered very feasible to use, especially in the implementation of P5 in elementary schools.

4) Disseminate

The Disseminate stage is the stage of spreading the media that has been developed. At this stage, the use of media is carried out on a wider scale, for example, at school or in class. This stage aims to test the effectiveness of using learning media in learning activities. After the deployment, students evaluate the validity of user satisfaction through a questionnaire. The results of the questionnaire are presented in table 4:

Table 4. Learner Response Results

School Name	Score Acquisition	Maximum Score	Average Percentage
School A	1066	1170	90%
School B	998	1092	91%
Total		**90.5%**	
Qualification		**Satisfied**	

Table 4 shows that students who learn using Assemblr Edu media are satisfied with their learning experience. The average percentage of questionnaire answers obtained in each school is 90% and 91%, respectively. The overall average score is 90.5%. This interactive Assemblr Edu learning media has a satisfying effect on students' use of it during learning.

Based on the research results, users have been well-received with developing Assemblr Edu, especially in implementing P5 in school learning. Assemblr Edu learning media is very

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effective for implementing P5 in schools. It means that user satisfaction with Assemblr Edu learning media and its suitability for implementing P5 in schools have been proven through research results.

With the rapid development of technology, utilizing technology for learning is appropriate. A study shows that Assemblr Edu's learning media technology makes learning more interactive and practical and provides innovation at the basic level. (Arrum & Fuada, 2021). Assemblr Edu Learning Media is useful in learning because, according to previous research (Putu Rissa Putri Intari Dewi et al., 2022) students assess this learning media as exciting and not boring when learning occurs. This is evidenced by the application of Assemblr Edu learning media, which runs as an interactive learning media application. Based on relevant research, the questionnaires obtained had perfect criteria, so it was concluded that Assemblr Edu media could attract participants' attention and was easily accessible via smartphone. This media also has advantages in using Augmented Reality in Assemblr Edu, which is applied in implementing learning. (Rinda et al., 2023).

Based on the results of research on the development of Assemblr Edu technology-based learning media in the development process using the 4D model (*Define, Design, Development, Disseminate*), that Assemblr Edu technology-based learning media becomes a product and the product is tested for feasibility by media validators as well as material. In the implementation in elementary schools, Assemblr Edu learning media gives a positive impression and impact; this enriches the literature on technology-based learning and educational innovation in the context of the Pancasila Learner Profile Strengthening Project (P5) dimension of Sustainable Lifestyle. In class teaching practice, the content to utilize Assemblr Edu can be adjusted to the needs of students and daily life. Of course, this research is very helpful in improving the quality of learning, by preparing students more thoroughly to become competent and characterized learners by Pancasila values.

Conclusion

The conclusion obtained from the results of this study is that the media developed meets the criteria very feasible, with the acquisition of an average presentation of media experts of 92% and material experts obtaining an average percentage of 97%. The results showed the average percentage of student questionnaire results or user satisfaction using Assemblr Edu learning media. The average percentage result shows 90.5% and is said to be satisfied with using Assemblr Edu media. Based on these results, Assemblr Edu media can be used in learning and implementing P5 in elementary schools using the RADEC learning model. Assemblr Edu Learning Media can be an alternative learning media that supports the times.

Recommendation

Based on the research results, there are the following suggestions:

a) Students can prepare smartphones so that they can open learning media in the form of Augmented Reality and 3D based on Assemblr Edu while learning and when studying at home.
b) For educators, the developed product is expected to be used as a reference in applying P5 with other materials and adapted to the needs during learning.
c) Further researchers can develop and create Assemblr Edu-based learning media that are superior and more interesting.

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