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Development of Media Smart Apps Creator Integrated Problem-Based Learning Model Learning on Reaction Rate Material

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Abstract: This research aims to produce an Integrated learning media product using Problem-Based Learning smart apps creator application with models Thiagarajan's 4D development. Based on research carried out, media expert opinion, educator response, participant response students towards integrated learning media Problem-Based Learning using the smart apps creator application gets criteria very worthy with an average media expert assessment score of 96.08%, educator response assessment 95.05%, and Student response assessment was 80.2%. The results of this research show that interactive learning media is based on Problem-Based Learning useing the smart apps creator application on the speed material point reactions can be used as a learning medium.

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Introduction

Technological advances have varied impacts on various aspects of life. Currently, the world is facing the Industrial Revolution 4.0 in various fields, including education. The industrial revolution encouraged advances in science and technology (IPTEK). The use of technology is an extraordinary breakthrough in improving the quality of education (Hermansyah, 2020). Learning in the 21st century requires teachers to utilize various innovations in technology. A teacher's ability is not only to develop pedagogical abilities in learning, but teachers must also have skills in using technology so that learning is in line with developments in the 4.0 era. (Irfani et al, 2021).

Skills in this technology are to improve learning outcomes and facilitate the process and availability of learning tools (Azizah, 2020). Technological Pedagogical Content Knowledge (TPACK) shows that content knowledge that integrates technology and pedagogical skills is an important condition in creating effective and innovative classroom teaching using technology (Yuliati et al, 2016). Educators' ability to use technology is one solution for preparing a competent millennial generation (Somantri, 2021).

Easy and interesting applications, one of which is Smart Apps Creator. According to Prokoso (2020), Smart Apps Creator is software in the form of an application that is used to create Android and iOS-based mobile applications without the need for program writing or coding and can produce EXE and HTML5 formats. Simply by having a network and a laptop or computer, applications can be created easily because in this case, Smart Apps Creator has

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provided application creation templates, making it easier for teachers to enter the material to be delivered, which can be in the form of text, images, or videos. Students can learn independently using learning media with the Smart Apps Creator application (Fadrial, 2021).

As educators, apart from using learning media that can attract students' interest in learning, educators are also obliged to choose the right model to convey a concept to students to achieve maximum learning outcomes. Efforts that educators can make are to use models that are suitable and can help students relate the material to real-life problems. Problem-based learning is a learning model characterized by real problems as a context for students to learn critical thinking and problem-solving skills and gain knowledge (Hatami, et al. 2023). According to previous research, Al-Fikry, et al (2018) stated that the Problem-Based Learning model was significantly better at improving students' critical thinking abilities than the conventional model.

Reaction rate learning material in chemistry is one of the contents that is often faced by students with a fairly high level of difficulty. In line with research by Dewi, et al., (2020), that class XI students still find it difficult to learn reaction rate material which has an impact on their low learning outcomes. Therefore, using the Problem-Based Learning learning model in teaching reaction rate material can be an effective approach (Larasati, et al. 2019).

Based on the problems described above, researchers are interested in conducting development research entitled "Development of Smart Apps Creator (SAC) Media Integrated Problem-Based Learning (PBL) Learning Models on Reaction Rate Material".

Research Method

This research is a type of development research or Research and Development (R&D) which is a research method with planning to create certain items through the development cycle and testing the feasibility of the items (Sugiono, 2017). The product developed is a smart apps creator media integrated with problem-based learning models on reaction rate material. Research and development method/Research and Development (R&D) with the Thiagarajan development method. The 4D research stage consists of (definition, design, development, and dissemination). Identification and definition stage, this stage is an initial analysis carried out to identify problems faced by students that need attention, especially in the application of the SAC learning media that will be applied. Design stage, the design stage consists of media selection, format selection, and media drafts in the form of product designs and storyboards. Development stage, the development stage includes the initial stage of product development which begins with preparing the Smart Apps Creator 3.0 software which will be used in developing learning media products. The product to be developed is in accordance with the product design that has been created so that the product developed has a concept that is appropriate to the design research subject and realizes it in the initial design. The initial product design was designed using the Canva application, then developed and created based on the application in SAC software. Dissemination or feasibility, at this stage the initial product that is ready to be made will be validated by several experienced experts to assess the new product being designed. After the learning media has been revised, product trials are carried out in small groups (limited tests) by looking at the responses of students and teachers to the newly created learning media.

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Analysis of non-test instrument data in this study used descriptive data analysis techniques using a Likert scale. The type of data obtained from the results of this research is qualitative data which is analyzed using quantitative data, namely in the form of numerical data and interpreted in the form of words. The Likert scale is used to measure the attitudes, opinions, and perceptions of a person or group of people towards a social phenomenon. In this study, a scale of 1 to 4 was used, with a score of 1 being the lowest and a score of 4 being the highest. as:

Table 1. Scoring on Student Response Sheets Based on a Likert Scale.

No	Criteria	Assessment criteria
1	4	Very interesting
2	3	Interesting
3	2	Quite interesting
4	1	Not attractive

Result and Discussion

Reaction rate learning material in chemistry is one of the contents that is often faced by students with a fairly high level of difficulty. This was also expressed by Sariati (2020), that many students find it difficult to learn chemistry because chemical concepts are abstract and complex, so they require deep and real understanding to learn them. In understanding the concept of reaction rate, students not only need to understand the basic theory but also must be able to relate this theory to everyday phenomena. In the learning process, students only use textbooks and when teachers deliver learning at school, students do not appear to be actively involved in the learning process. The ongoing learning process is also dominated by teachers rather than students.

Smart Apps Creator media is designed by first identifying the syllabus, learning objectives, and materials that will be used and are by the 2013 curriculum. The next step is to determine learning activities that are adapted to the stages and steps of the problem-based learning model. The problem-based learning model is a learning model that encourages students to solve problems using scientific methods, so that students can learn knowledge related to the problem and also have an advantage in solving problems (Aritonang and Zubir, 2022). This learning model involves giving problems to students as an initial step in the learning process, which is then solved using problem-solving strategies so that students are actively faced with complex problems that must be solved (Purba, E., & Munzirwan, R. 2022). This SAC media consists of an initial display in the form of an opening video, cover, main menu, learning objectives, concept map, initial ability test, material, evaluation test, and profile. This media was designed and adapted using feasibility assessment aspects in accordance with the National Education Standards Agency (BSNP). This instrument was then given to a media expert for validation by a media expert, namely a lecturer. In creating media, the problem faced is that the smart apps creator software only has a 30-day trial.

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Criticism and suggestions given by media experts are then used as a reference for improving revisions to the media that has been developed so that media that is suitable for use is obtained.

Table 2. Media Expert Validation Assessment Results

No	Assessment Aspect	Percentage Assessment		Average
		Validator 1	Validator 2	(%)
1	Linguistic Aspect	93,75	93,75	**93,75**
2	Aspect of Software Engineering	93,75	100	**97**
3	Display Aspect	95	100	**97,5**
	Overall Average (%)			**96,08**
	Results Criteria			**Very Worth It**

Based on the table above, it shows that the assessment is divided into three aspects, namely linguistic aspects, software engineering aspects, and appearance aspects. The data obtained was managed using a Likert scale with the presentation results of each validator assessment, the presentation results of validator 1's assessment were 93.75% for the linguistic aspect, 93.75% for the software engineering aspect, and 95% for the appearance aspect. Meanwhile, the results of validator 2's assessment presentation were 93.75% for the linguistic aspect, 100% for the software engineering aspect, and 100% for the appearance aspect.

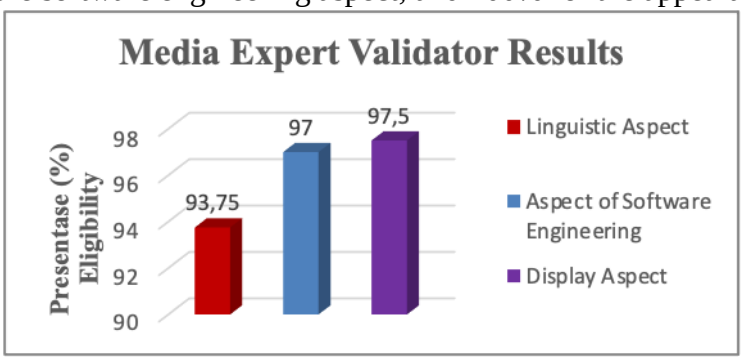

Figure 1. Graphic of Media Expert Validation Results

Figure 1 shows the results of media validation with three assessment aspects, with different colors for each aspect, where the red color is the linguistic aspect assessment with a result of 93.75%, the blue color is the software engineering aspect assessment with a result of 97%, and purple is an assessment of the appearance aspect with a result of 97.5%. The average value of the three assessment aspects is 96.08% in the "very feasible" category.

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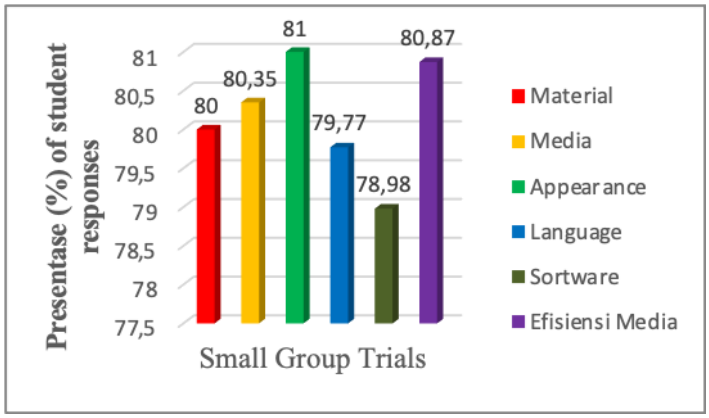

Figure 2 shows that the data obtained from filling out a questionnaire regarding students' interest responses on a small/limited scale to the media being developed, namely from students in class assessment of 80%, media aspects with an assessment percentage of 80.35%, display aspects with an assessment percentage of 81%, linguistic aspects with an assessment percentage of 79.77%, software aspects with an assessment percentage of 78.98%, and aspects media efficiency with an assessment percentage of 80.87%. The average value of the students' responses to the six assessment aspects was 80.2% in the "interesting" category. Meanwhile, the assessment of educators' responses is divided into three aspects, namely appearance and effect for users, practicality, and media content. Data was obtained using a Likert scale with a presentation of each aspect, namely 96.42% for the appearance and effect aspects for users, 95% for the practicality aspect, and 93.75% for the media content aspect. The average value of the results of educators' responses to the three assessment aspects is 95.05% in the "Very interesting" category.

The students' responses to the SAC media that had been developed showed the results of the assessment presentation with an average score of 80.2% in the "decent" category. So it can be concluded that the SAC media integrated the PBL learning model in reaction rate material which is interesting and gets a positive response from students. This is in line with Yessi's (2021) research on the use of Android-based learning media with the Smart Apps Creator "Colloidal Nature" and Instagram as learning media and evaluation tools, apparently providing a good response for students. Based on previous research conducted by Mas'ud, H., et al (2023), the results of students' assessments based on the appearance aspect received a percentage score of 53.3% or very interesting, while students' assessment based on the content aspect of the material received a percentage score of 56.7% or very feasible, while the usefulness aspect received a percentage score of 56.7% or very useful.

Conclusion

The feasibility of smart apps creator media integrated with problem-based learning models on reaction rate material based on BSNP standards which have been validated by media experts received an average score of 96.08%, so it can be concluded that the media as a whole is included in the "very feasible" category, which means The media developed is very suitable for use as learning media. Meanwhile, the response of students and educators to learning media is reviewed from several aspects and overall is included in the "decent and

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very appropriate" criteria. This is based on a feasibility assessment in terms of response assessment aspects with percentage results of 80.2% and 95.05%, which means that students and educators respond very well to this media and it is very suitable if it becomes a medium in the learning process.

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