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The Effect of Power Point Media Integrated with Animation on Student Learning Outcomes on Reaction Rate

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Abstract:The Effect of Power Point Media Integrated with Animation on Student Learning Outcomes on Reaction Rate. The purpose of this study is to ascertain whether animated power point presentations have an impact on students' learning of reaction rate material. All of the students in class XI MIPA SMA Negeri 7 Medan served as the study's population, and the research samples, class XI MIPA 3 and XI MIPA 4, which were chosen using the purposive sampling technique, comprised the study's research samples. The chemistry learning outcomes exam and student response questionnaire were the test-and-non-test instruments utilized in this study. Each test had up to 20 multiple-choice questions, while the response questionnaire had up to 12 affirmative statements**.** Based on one tiled t test, the tcount was 3.498 and tα was 1.67. Because tcount ≥ tα corresponds to the Ho rejection area, Ha is accepted. So it is concluded that the hypothesis is accepted, which means that there is an effect of PPT media integrated with animation on student learning outcomes on reaction rate material. Meanwhile, students' response to the PPT media integrated with animation was obtained as much as 1099 with a percentage of 76.319%. The acquisition of these results concluded that students in experimental class 1 who were taught with PPT media integrated animation had a response with a good category**.**

Keywords: Problem Based Learning Model, Power Point Media, Learning Outcomes and Response, Reaction Rate.

Abstrak:Pengaruh Media Power Point Terintegrasi Animasi Terhadap Hasil Belajar Siswa Pada Materi Laju Reaksi. *Tujuan dari penelitian ini adalah untuk mengetahui apakah presentasi power point beranimasi berdampak pada pembelajaran siswa pada materi laju reaksi. Seluruh siswa kelas XI MIPA SMA Negeri 7 Medan menjadi populasi penelitian, dan sampel penelitian adalah kelas XI MIPA 3 dan XI MIPA 4 yang dipilih dengan teknik purposive sampling. Tes hasil belajar kimia dan kuesioner respon siswa merupakan instrumen tes dan non-tes yang digunakan dalam penelitian ini. Setiap tes terdiri dari 20 soal pilihan ganda, sedangkan angket respon siswa terdiri dari 12 pernyataan positif. Berdasarkan uji t pihak kanan diperoleh t_{hitung} sebesar 3,498 dan tα adalah 1,67. Karena $t_{hitung} \geq t\alpha$ sesuai dengan daerah penolakan Ho maka Ha diterima. Sehingga disimpulkan bahwa hipotesis diterima, yang artinya terdapat pengaruh media PPT terintegrasi animasi terhadap hasil belajar siswa pada materi laju reaksi. Sedangkan respon siswa terhadap media PPT terintegrasi animasi diperoleh sebesar 1099 dengan persentase sebesar 76,319%. Perolehan hasil ini menyimpulkan bahwa peserta didik pada kelas eksperimen 1 yang dibelajarkan dengan media PPT terintegrasi animasi memiliki respon dengan kategori baik.*

Kata kunci: *Model Problem Based Learning, Media Power Point,Hasil Belajar dan Respon, Laju Reaksi*

- **INTRODUCTION**

The 2013 curriculum is the one currently being used in high school settings. The primary focus of learning in the 2013 curriculum is learner activities rather than educators. According to the 2013 curriculum, teachers are only expected to act as facilitators, hence it is expected that they will teach pupils how to deal with contextual and real-world problems (Pardomuan, 2013). Chemistry is one of the disciplines taught in high school. Chemistry material contains many concepts that are quite difficult for students to understand, because it involves chemical reactions and calculations and involves concepts that are abstract and are considered by students to be relatively new material (Ristiyani & Bahriah, 2016).

Many factors, both internal and external, play a role in why students find it difficult to comprehend during the learning process. Internal factors include things like interest, pleasure, intelligence, and others, while external factors include things like family, school, and other external influences (Darimi, 2016). If these two elements have an impact on pupils while they are studying, it will have a negative effect on student learning results. One of the topics covered in class XI SMA / MA is reaction rate. Because the topic is complex, reaction rate is a component of an abstract chemical concept. The subject of reaction rate teaches students about collision theory, reaction rate computation, and reaction rate-affecting variables. One of the senior high schools in Medan City is SMA Negeri 7 Medan, which is situated at Jl. Timor No. 36 in the Gaharu area of the East Medan Sub-district.

Based on preliminary observations made on October 4, 2022 was determined that educators continue to use traditional learning models when teaching chemistry, specifically the lecture method, which prevents students from being directly involved in the learning process and leads to students becoming increasingly bored throughout the lesson. Preliminary observations also revealed that teachers did not include any media into the learning process, solely using textbooks as teaching resources. The average result of the XI grade reaction rate exam in the 2021-2022 academic year has not reached the minimum completion value, which is 30%, based on historical data from the institution. Therefore, it can be concluded that the current chemistry learning on reaction rate material is inadequate.

Based on the aforementioned issues, they can utilize learning models as teaching tools in an effort to resolve them so they can inspire students to take an active role. Problem-based learning is one of the learning models that can be applied in accordance with the reaction rate material. PBL is a teaching strategy that promotes students' understanding of how to learn and their ability to collaborate in groups to discover answers to issues that arise in the real world (Akcay, 2009). With the PBL paradigm, learning involves more than just receiving information from teachers; instead, students can take the lead and participate in discussions and activities (Rampi et al., 2021).

This is consistent with the analysis of various sources; in the study by (Sandabunga' et al., 2021), it was found that there was a significant difference in the achievement of learning outcomes between students taught using the PBL model and students taught using the traditional model. To the difference in learning outcomes before and after being given a problem-based learning model which will provide an increase in learning outcomes (Choiriyah et al., 2022). Using the PBL learning model had a substantial impact on the cognitive learning outcomes of class XI students at SMK Negeri 02 Manokwari research on the concept of reaction rate, according to (Utami et al., 2019). The PBL learning technique was applied in the experimental class, and a 30% effect was observed.

In research conducted by (Ghufroni & Hastuti, 2013), the use of powerpoint media in learning can increase student learning completeness in stoichiometry material in cycle I by 36.1% then increased in cycle II to 71.4%. (Sativa & Jasmidi, 2022) research concluded that there was an increase in student learning outcomes taught with a scientific approach using powerpoint media higher than the increase in student learning outcomes taught with conventional models. There is a positive effect of the problem-based learning model learning model on the learning outcomes of X MIPA class students of SMA Negeri 6 Makassar, according to the research (Alwi et al., 2022). PBL models outperformed traditional ones in (Sirait & Hutabarat, 2013) study in terms of learning outcomes. According to (Janah et al., 2018), using the PBL technique with materials from salt hydrolysis has an impact on students' learning results.

By using learning media in the classroom, educators can try another approach to solving these issues. Powerpoint is the ideal learning tool for reaction rate topics. One of the Microsoft Office application programs called Power Point is great for creating slideshow presentations, and it's frequently used for teaching, presenting, and animating. Power Point's benefits include being simple to use, offering a selection of themes, beautiful templates, and being able to integrate images, videos, and sound. Animation is a form of interactive media that displays moving pictures that closely resemble the real world (Sandi et al., 2016). When it comes to aiding teachers in the teaching of either group, individual, or mass learning, animation is a very successful medium.

Animation is utilized in the classroom to grab students' attention, boost motivation, and boost participation. Animation usually displays the movement of objects or images so that they can change position at a certain time, creating the illusion of a motion picture (Apriansyah, 2020). These media act as a middleman for the distribution of educational resources, making it simple for students to access information during the learning process. With the beautiful presentations offered by power point and animation media, this media can help enhance activity and engage students' attention. Students' greater engagement and focus during the learning process will result in improved learning results.

In particular, given the student-centered nature of the 2013 curriculum, it is crucial to have comprehensive study resources that can help teachers increase students' involvement in the learning process. Teachers will be able to design learning by putting students at the center of the learning process and encouraging their engagement, critical thinking, and curiosity in the teaching and learning process. Students who are actively involved in the learning process and who see the learning environment as pleasant will do better in chemistry classes. Based on this description, researchers are considering doing a study on "The Effect of Power Point Media Integrated with Animation on Student Learning Outcomes on Reaction Rate Material".

▪ METHOD

This study used a quasi-experimental methodology and pretest-posttest control group research design. Where quasi experiment is a research design conducted under conditions that do not allow controlling or manipulating all relevant variables (Kumalasari, et.all 2023). The population of this study consisted of all of the odd semester XI grade students at SMA Negeri 7 Medan during the 2022–2023 academic year, with a total of 6 classes and 30 students in each class. The sample was chosen based on the students' baseline abilities being fairly similar, as seen by the generally equal average learning outcomes. Purposive sampling was used to choose samples from the XI MIPA 3

and XI MIPA 4 classes for this investigation. Experiment I and Experiment II classes were created from the classes chosen as samples.

The main source of data for this study is test scores (pretest and posttest scores). In addition, surveys that students responded to after viewing animated Powerpoint presentations serve as supplementary data. The viability of the test instrument (pretest-posttest) was assessed using validity and reliability tests. The effectiveness of this instrument is evaluated using students who have been given reaction rate material. The data analysis uses Microsoft Excel. Item validity was assessed using product moment correlation by calculating the correlation between the results of the test items and the total score:

$$\text{Rxy} = \frac{N\sum \text{XY} - (\sum \text{X})(\sum \text{Y})}{\sqrt{\{N\sum X^2 - (\sum \text{X}))^2\{N\sum \text{Y}))^2 - -(\sum \text{Y}))^2\}\}}}$$

In order to determine if an item is legitimate, the validity coefficient (rxy) is calculated and compared to the values of the r product moment table at a level of 0.05 (Silitonga, 2014). Reliability is determined using Cronbach's Alpha. The criteria for the degree of reliability (r11) according to Guilford are shown in Table 1.

Table 1. Criteria for Degree of Reliability

Realibilitas	Interpretasi
r11 ≤ 0,20	Extremely low
0,20 < r11 <0,40	Lower
0,40 < r11 <0,70	Medium
0,70 < r11< 0,90	Higher
0,90 < r11 1,00	Extremely High

While the student's response to the animated integrated power point media on reaction rate material is seen from the calculation of the linkert scale. The linkert scale formula is:

$$\text{P} = \frac{f}{N} \times 100\%$$

A linkert scale is used to calculate the score, and its measurements are shown in Table 2.

Table 2. Linkert Scale Ranges

Alternative Answers	Score
Strongly Agreed	4
Agreed	3
Disagreed	2
Disagree strongly	1

The hypotheses were put to the test using Microsoft Excel. First, the findings of the pretest, posttest, and student response tests were tested for homogeneity and normality. The sample is thought to be normally distributed and to have a homogeneous variance if the sig value is greater than 0.05. If the sample has a normal distribution and is homogenous, the next right party should perform a t test using the criterion t-count> tα(db) to determine whether to accept or reject Ho. The formula for calculating t-count is as follows:

$$t_{hit} = \frac{(\bar{X}_1 - \bar{X}_2)}{S\sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

▪ RESULT AND DISCUSSION

Validity and reliability testing are conducted before students are given the test instrument (pretest-posttest). This test tries to determine whether a tool or measuring equipment is appropriate for testing as a tool in research. Students who have studied reaction rate material were used to test the test equipment in this study. The test data was then obtained, examined, and modified to meet Guilford's criteria. The results of the validity test are shown in table 3 below:

Table 3: Categories of Test Validity

Test Validity Category	Question Number
Valid	1, 2, 11, 17, 18, 19, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 34, 38, 39, 40

The reliability calculation produced the results rcount of 0.85075 and rtable at = 0.05 of 0.374. Given that rcount> rtable, the test tool used in this study is reliable and usable. Based on the results of the validity and reliability tests, which showed that the test questions were valid and reliable, the test instrument is deemed suitable for use in evaluating student learning outcomes. Both classes in this study are first given a preliminarily test (pretest) consisting of 20 items that satisfies the criterion for validity and reliability. Pretests are used to evaluate students' starting abilities. Experimental class 2 scored on average 29 on the pretest, compared to experimental class 1's average of 31.67. The graph below more clearly illustrates the discrepancy between the pretest outcomes for the two classes:

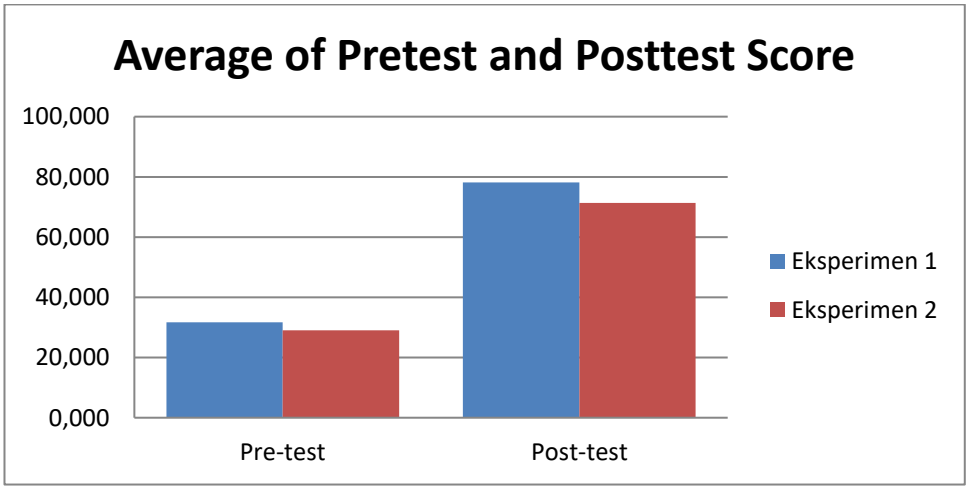

Fig. 1 Average Pretest to Posttest Difference in Scores

According to the curve in Figure 1, Experimental Class 1 has a higher average pretest score. It can be seen from the graph that the starting abilities of the students in the two classes are essentially the same. Additionally, both courses received treatment, with experimental class 1 receiving a problem-based learning model using PPT media

combined with animation and experimental class 2 receiving a PBL model using PPT media only. The researcher introduced the learning objectives in the PBL model class using PPT media integrated with instructional animations before piqueing students' interest with a connection to daily life in the form of a firework eruption process running quickly while the browning of pears runs with a long process. The students provided thoughtful responses when asked a question. The idea of reaction rate is then connected to the responses provided by the students. The researcher instructed students to create groups after explaining the idea of reaction rate, and each group then distributed lkpd.

The researcher asked each learner to understand, discuss, and work on worksheets (LKPD) related to the concept of reaction rate. While discussing the worksheet, students pay attention to the PPT media integrated with animation which displays the reaction rate material in detail. Furthermore, students are given time to discuss in answering the questions on the LKPD, the researcher asks students who are willing to present the results of their discussion. The students seemed enthusiastic in answering the questions on the LKPD, seen from their enthusiasm to present without being pointed. When there are answers from students who are still not right, the researcher as a facilitator provides reinforcement on the material discussed so that it will increase students' memory of the material learned at this first meeting, so on until the last meeting in learning with the PBL model using PPT media integrated with animation.

Similar to experimental class 1, which started with the researcher outlining the learning objectives, instruction in experimental class 2 follows the PBL paradigm while using PPT media. Additionally, the researcher introduces students to the issue by posing the question, "Which occurs faster, the burning of firecrackers or the eruption of fireworks? " and asking them to respond. These problems are related to issues that arise in everyday life, such as the browning of pears and the eruption of fireworks. Additionally, groups of students are divided up and told to have a discussion regarding the worksheet's questions. During this discussion, students focus on PPT media that contains information about reaction rates in depth. Additionally, researchers allow students time for debate and request that they submit the outcomes of their talks. The researcher revises or reinforces the student arguments after they present the outcomes of their discussion, and so on until the final meeting.

After the learning has been finished in both classes, a posttest with 20 multiple-choice questions is given to gauge how much the students have learned after using both PPT media with animation and PPT alone. The average student learning outcomes with PPT media integrated with animation were 78.170 and with PPT media alone were 71.33, respectively. It is clear from the graph in Figure 1 that both classes improved when compared to the pretest findings.

The results of hypothesis testing with the right party t test obtained student learning outcomes with tcount of 3.498 and t0.05 (58) is 1.671 because tcount> tα then Ho is rejected or Ha is accepted. So it is concluded that the hypothesis is accepted, meaning that there is an effect of using PPT media integrated with animation on student learning outcomes. The usage of PPT media integrated animation makes learning more engaging and can stimulate students, which improves learning outcomes. PPT media integrated animation is used to provide PBL reaction rates that students can visualize. Based on these criteria, it is determined that Ha is accepted.

This is consistent with the research of (Nainggolan & PW, 2019), which claims that the learning outcomes of students taught with PPT media are higher than students

who are not taught with PPT media, as evidenced by Fhitung > Ftabel (0.949 > 0.6794). According to (Sholeh, 2021) research, there are differences between learning outcomes before and after using animation-based interactive learning media, as shown by the increase in sig value (2-failed) 0.000 0.05. This is because students score higher after using animation-based interactive learning media than they did before. (Saragi & Makharany Dalimunthe, 2022) stated that the learning outcomes of students taught with the PBL model using PPT were higher than the learning outcomes of students taught conventionally by obtaining an average posttest in both classes of 80.88 and 74.12. Khibri (2019) in his research also stated that the use of power point media can improve student chemistry learning outcomes, student activity and some students feel happy with learning through the application of PPT media.

A response questionnaire with 12 statements was given to students in experimental class 1 who were exposed to PPT media with animation to determine whether their replies fell into the very good, good, less good, or not good categories. As a consequence, the PPT media integrated animation received a student reaction score of 1099, with a percentage of 76.319%. The table below contains a description of the student response data utilizing animated integrated power point media.

Table 4 : Student Response Data Description

Class	Student Count	Persentase	Category
Eksperimental 1	30	76,319%	Good

These findings indicated that experimental class 1 students who were taught using PPT material that included animation had responses that were in the "good category." According to the research, using this media has a positive effect on learning since the PPT media with animation provides reaction rate content complete with photos, reactions, and animations that showcase visual appeal. This is in line with Dewita's research (2020), which states that learning media based on visualization and animation are very feasible to be applied to the learning process because students focus their attention more during this media is used in the learning process, as evidenced by the response percentage of 89.4% which is categorized as very feasible to use.

▪ CONCLUSION

Based on the research results, PPT media with animation has an impact on student learning outcomes when used on reaction rate material. This is indicated by the tcount value of 3.498 and the tα value of 1.67. Ha is accepted because tcount ≥ tα in accordance with the Ho rejection area. Thus, it can be said that the proposed hypothesis is correct, meaning that PPT media equipped with animation has an influence on student learning outcomes on reaction rate material. As well as student response to PPT media integrated with animation amounted to 76.319%. This result concluded that students in experimental class 1 who were taught with PPT media integrated with animation had a response with a good category. This research is important to encourage student activeness during the learning process so as to improve learning outcomes, as well as as a consideration for teachers to apply media and learning models that are in accordance with learning materials.

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