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THE EFFECT OF POWTOON ANIMATION MEDIA TOWARDS MOTIVATION AND LEARNING OUTCOMES OF STUDENT ON CHEMICAL EQUILIBRIUM MATERIAL

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Abstract

The research was a quasi-experiment that aimed to determine the effect of powtoon animation media toward motivation and learning outcomes of student on chemical equilibrium. This research uses guided inquiry learning model in the teaching process. The independent variable in this research was powtoon animation media in guided inquiry learning model and the dependent variable was motivation and learning outcomes at class XI Exact SMAN 2 Maumere. The population of this research were all of class XI Exact SMAN 2 Maumere consist of 4 class and totaling 123 students. The sample consisted of two classes of class XI Exact 4 as an experiment with 23 students and class XI Exact 2 as the control with 20 students. Data collection technique was obtained from questionnaires for motivation and objective test which consist of 20 items multiple choice. The average of learning motivation in experiment class is higher than control class with scores of 81.33 and 71.41. The average of learning outcomes in experiment class was high 81,7 than control class was 74,5. The data analysis technique used descriptive statistical analysis and inferential statistical analysis for learning outcomes. The hypothesis test using t test shows that tcalculate (1,90) > ttable (0,60) on $\alpha = 0{,}05$. Based on the results of data analysis can be concluded that there was an effect of powtoon animation media toward motivation and learning outcomes on Chemical Equilibrium Material

Keywords: powtoon animation media, motivation, learning outcomes, chemical equilibrium.

1. INTRODUCTION

Success in the learning process can be influenced by various factors including the learning outcomes obtained by students. Cognitive learning outcomes of students can be improved by the teacher's efforts to choose models, methods, or strategies by using learning media that are suitable for students. The involvement of students in the learning process is very important, in this case, students must play an active role in the learning process.

Chemistry learning itself has three aspects, namely macroscopic, microscopic and symbolic. Animation can be useful and students find it more helpful for them to understand the course (Hammoumi, Zerhane, & Idrissi, 2022). However, most students do not master all aspects, especially the microscopic aspects which contain abstract concepts. One of the chemical materials that contains microscopic concepts is chemical equilibrium. In this material, there is the concept of a shift in equilibrium which can be affected by changes in concentration, volume, pressure, and temperature. The difficulty of students in understanding the material can be seen in the incompleteness of student learning outcomes when doing tests.

Based on the results of an interview with one of the Chemistry teachers at SMAN 2 Maumere, the cognitive learning outcomes of students in class XI on the subject of chemical equilibrium are still not optimal. This can be seen from the percentage of students who have not been able to reach the standards set by the school or the Minimum Completeness Criteria (KKM) of around 50%. This is also not in accordance with the demands of the 2013 curriculum which requires students to achieve a minimum mastery score.

Observations made directly on the learning atmosphere in the classroom showed that when the teacher taught many students were not enthusiastic about participating in the learning process. One of them can be seen from the facial expressions of the students who are not serious in following the learning process, they tend to be noisy in class and are not serious in learning. In addition, the use of learning tools is also very rarely used in the learning process.

One possibility of this deficiency is that students who have difficulty understanding microscopic concepts can lead to misunderstandings. If this error takes place consistently, it will lead to wrong concepts or misconceptions. Therefore, teachers are required to use appropriate learning media to make it easier for students to understand the concept. In addition, the lack of student motivation in studying chemistry is also a problem that needs to be overcome.

The teacher's role in the learning process demands the teacher's ability to use learning media that can increase students' motivation and learning outcomes and make students able to play an active role. One of the learning models that can increase motivation and learning outcomes and make students able to play an active role is the guided inquiry learning model. The guided inquiry learning model demands the activeness of students in the learning process, students will actively seek, investigate, and find a concept or information for themselves while the teacher plays a role in guiding students to find the concept or information. This will also make the lessons received by students will not be quickly forgotten but will survive in the long-term memory or memory of these students, because they are looking for, and investigating a particular concept or knowledge specifically through the help of learning media (Amri, 2013).

Many learning media are being created at this time, but to find a really good learning media so that the learning process becomes effective, efficient, interesting and fun is a problem that needs to be solved. One way that can be used by teachers to overcome problems that occur during the learning process both experienced by students and teachers themselves, is by using learning media in the learning process. Learning with animated powtoon media can convey comprehensive information to all students despite their diverse learning styles. Powtoon animation media involves both hearing and sight in one process or activity so that students who have an audio learning style can be stimulated to audio learning and students who have a visual learning style will also get visual learning stimuli.

Research on the development of animated video-based learning media with guided inquiry learning models can also increase motivation and learning outcomes so, that learning becomes effective and practical (Sya'bania, Anwar & Wijaya, 2020). Based on the description above, research was carried out to determine the effect of Powtoon animation media towards motivation and learning outcomes of students on chemical equilibrium material.

2. METHOD

The type of research used is quasi-experimental research. This research was conducted to test whether there is an effect of using powtoon animation media on students' motivation and learning outcomes. This study consists of two variables, namely the independent variable and the dependent variable. Powtoon animation media in guided inquiry learning model and guided inquiry learning model without powtoon animation media as independent variables, while motivation and student learning outcomes as dependent variables.

The research design used is Posttest-Only Control Design. The research design pattern is as follows:

Tabel 1. Research Design

R_1	X_1	O_1
R_2	X_2	O_2

Description:
R_1 = experiment class
R_2 = control class

X_1 = Treatment with inquiry learning model using powtoon animation media
X_2 = Treatment with inquiry learning model
O_1 = Posttest scores of students in the experiment class
O_2 = Posttest scores of students in the control class

The population in this study were all students of class XI IA SMAN 2 Maumere for the academic year 2021/2022, which consisted of four classes with a total of 123 students. Sampling in this study was carried out using a simple random sampling technique, namely taking two classes from four classes of XI IA students at SMAN 2 Maumere. The class that was selected as the experimental class was XI IA 4 while the control class was XI IA 2. This research was conducted in the odd semester of the 2021/2022 academic year located in Sikka Regency, Alok District, namely at SMAN 2 Maumere in four meetings with three meetings to learning process and one meeting for the test.

The instrument used in this study was a motivational questionnaire, a learning process observation sheet, which was filled out by an observer who had been determined by the researcher. Based on the results of the assessment of learning motivation, it is said to be effective if it is in the "Very High" category. In addition, the test is a test of learning outcomes in the form of multiple choice as many as 20 items with 5 answer choices that will go through a content validation process by competent parties and item validation through test questions on class XI IPA 1 SMAN 2 Maumere students. Student learning test results are converted into grades with the following formula:

$$\text{Value} = \frac{\text{score obtained by students}}{\text{maxium score}} \text{ x } 100$$

Table 2. Minimum Completeness Criteria (KKM) at SMAN 2 Maumere

LEVEL OF COMPLETENESS	CATEGORY
$\geq 75,00$	FINISHED
$< 75,00$	NOT FINISHED

(Source: SMAN 2 Maumere)

$$\% \text{ completeness} = \frac{\text{number of students who completed}}{\text{total number of students}} \times 100\%$$

This research hypothesizes that there is an effect of powtoon animation media on motivation and student learning outcomes on chemical equilibrium material.

3. Results and Discussion

3.1 The results of the analysis learning motivation

The effect of the animated powtoon media used in learning the chemical equilibrium material can be seen from the data on the learning motivation of students in the experimental class and the control class. The results of the analysis of students' learning motivation can be seen in Table 3.

Tabel 3. The Results The results of the analysis of learning motivation for the experimental class and the control class

No	*Indicator*	*Class*	
		Experiment	**Control**
1	Enthusiasm and diligence in doing the task	82.07	82.55
2	Tenacious in facing difficulties / not easily discouraged to achieve a goal	83.08	84.11
3	Pay attention to the teacher when explaining the subject matter	80.11	84.57
4	Enjoy working/doing tasks of their own volition	86.74	89.84

5	Motivated by the situation and learning environment	90.15	80.08
6	Happy to solve problems	86.36	81.64
7	The spirit of competition in conveying and defending his opinion	82.77	83.40
	Average	**81.33**	**71.41**

The average result of the experimental class students' learning motivation was higher than the control class. This shows that animated video-based learning media can increase students' learning motivation. The results of this study are by the theory of (Bravo, Payumo, & Pittendrigh, 2021) Results from the study identified the most watched videos on the youtube channel can increase insight for boosting higher educational institutions participation in informal educational science animation and ICT learning practices using platforms like YouTube. The findings also point to where improved methods for reaching the intended recipients of informal education online are needed to best leverage the potential of such platforms, so that researchers use powtoon as a platform to design animation media.

3.2 Descriptive statistical analysis of learning outcomes

The results of descriptive statistical analysis of student scores in the experimental class and control class include the table, the highest score, the lowest value, the calculated variance, and standard deviation, in Table 4.

Table 4. Descriptive Statistics Value of Student Learning Outcomes in the experimental class and control class

Statistics	***Statistics Value***	
	Experiment Class	**Control Class**
Number of Samples	23	20
The highest Score	90	85
Lowest Valye	65	60
Mean	81,7	74,5
Median	79,2	76
Modus	86,3	78,2
Variants (S^2)	57,90	59,21
Standard Deviation (S)	7,6	7,69

Table 4. Shows that there is a difference between the test scores of students' learning outcomes for the experimental class and the control class. This can be seen in the mean, median, and mode values for the experimental class which is higher than the mean, median, and mode values for the control class.

Table 5. Minimum Completeness Criteria for Students

LEVEL OF COMPLETENESS	**CATEGORY**	**EKSPERIMENT CLASS**		**CONTROL CLASS**	
		Frequency	**Percentage**	**Frequency**	**PERCENTAGE**
$\geq 75,00$	Finished	19	82,6%	12	60%
$< 75,00$	Not finished	4	17,4%	8	40%

Table 5. shows that the minimum completeness criteria (KKM) for learning outcomes at SMAN 2 Maumere is 75, so students who are classified as complete for the experimental class are 19 people out of 23 total students. As for the control class, students who achieved the completeness criteria were 12 people out of 20 students. So that the percentage of completeness in the experimental class is 82.6%, while in the control class is 60%. These data, it shows that the results obtained in the experimental class are higher than the control class.

The use of powtoon animation media in the experimental class makes students interested in the learning process so powtoon animation media supports student learning outcomes. This is following what is described by (Anggraini, Yuhelman, & Ningsih, 2022) that the animated video learning media is very suitable to be used as a medium for learning chemistry. Based on the results of descriptive analysis, it was found that the average learning outcomes of the experimental class were higher,

namely 81.7, and in the control class was 74.5. In addition, the number of students who achieved the criteria for completeness in the experimental class was more than in the control class.

3.3 Inferential statistical analysis of learning outcomes

3.3.1 Normality Test

The normality test is carried out to know whether the population used is normal or not. The normality test uses the chi-square test statistic (χ^2), the data is said to be normal if $\chi^2_{\text{count}} < \chi^2_{\text{table}}$. From the calculation results for the experimental class, $X^2_{count} = 3{,}2116$ while the value X^2_{table} for the experimental class at the confidence level (α) = 0.05 and degrees of freedom (dk) = 2, then $X^2_{table} = 5{,}991$. So it can be concluded that the sample in the experimental class is normally distributed because of $X^2_{\text{count}}(3{,}2116) < X^2_{\text{table}}(5{,}991)$. For the control class in the calculation results, the values of $X^2_{\text{count}} = 3{,}0748$, and X^2_{table} at the confidence level (α) = 0.05 and degrees of freedom (dk) = 2, then $X^2_{\text{table}} = 5{,}991$ is obtained.

3.3.2 Homogenity Test

A homogeneity test was conducted to determine whether the data from the two groups were homogeneous or not. The homogeneity test criteria is $F_{\text{count}} < F_{\text{table}}$.

Based on the results of the homogeneity test using the variance from the control class as the largest variance and the variance from the experimental class as the smallest variance, the data obtained $F_{\text{count}} = 1{,}02$ while F_{table} at the confidence level (α) = 0.05, then obtained $F_{\text{table}} = 2{,}13$.

3.3.3 Hypothesis Testing

This hypothesis testing aims to determine the differences in student learning outcomes between the experimental class and the control class. After it is known that the sample is normally distributed and comes from a homogeneous variance, then proceed with hypothesis testing. The one-party *t*-test was used to test the hypothesis. The *t*-test was performed on each experimental class and control class. Based on the calculation results, the value of $t_{\text{count}=}$ 1,90 and the value of t t_{table} at the confidence level (α) = 0.05, and the degrees of freedom (dk) = 41, which is 0.60. The value of $t_{count} > t_{table}$, then H_1 is accepted and H_0 is rejected and it can be concluded that there is an effect of of powtoon animation media on motivation and student learning outcomes on chemical equilibrium material, because $t_{\text{count}}(\mathbf{1,90}) > t_{\text{table}}$ (0,60).

Inferential statistical analysis is a statistical analysis used to analyze sample data and the results are used for the population. This analysis is used to test normality, homogeneity, and research hypotheses. Based on the analysis prerequisite test, it is stated that the data from the experimental class and control class come from a population that is normally distributed and homogeneous so that hypothesis testing using the t-test can be continued. The results of hypothesis testing using the t-test obtained the value of $t_{\text{count}=}$ 1,90 and the value of t_table at the confidence level (α) = 0.05and the degrees of freedom (dk) = 41, which is 0.60. This shows that $t_{\text{count}} > t_{\text{tabel}}$, which means H_0 is rejected and H_1 is accepted, it can be concluded that there is an effect of of powtoon animation media on motivation and student learning outcomes on chemical equilibrium material.

Learning media is a teaching aid used by teachers to convey their learning messages. Powtoon application has several benefits, namely: learning becomes more effective, can improve student learning achievement, can increase student learning motivation, and improve teacher skills in managing learning (Deliviana, 2017). Learning outcomes in the experimental class given powtoon animated media at each meeting using the guided inquiry learning model were higher than the control class with the guided inquiry learning model without powtoon animation media because providing powtoon animation media at each meeting could make students interested in learning more seriously and actively in the learning process.

Based on observations, when students find out that powtoon animated media will be given, they become interested in focusing on learning, with the guided inquiry learning model students can be more active in the learning process making it easier to understand the material being taught and students will remember it longer. That science learning using animation media is very effective in use in learning activities. By using animation media, student learning outcomes will increase, this is evident from the average value before using animation media and after using animation media (Khomaidah & Harjono,

2019). The use of powtoon animation media can make abstract concepts more concrete in this case chemical equilibrium material.

The use of this animated powtoon media makes it easier for the material to be digested and easier for students to remember. In addition, that the application of animation software powtoon can help teachers in improving student learning outcomes. The results of the analysis of the suitability of teacher and student activities in the process of learning are said to increase with each cycle. The results showed that the teacher's skills were good in managing learning by applying powtoon software animation media. The results of the data processing show that learning by using animation software powtoon is very good fun and helps students understand the subject matter (Trina, Kamaruddin, & Rahmani, 2017).

Several benefits are taken by students and teachers in animation-based learning, namely: Introduction of information and communication technology devices to students, provide a new and enjoyable experience for both the teacher and the students, fun learning methods can increase motivation to learn more, catch up with knowledge about science and technology in the field of education, follow the development of science and technology (Simarmata, Sibarani, & Silalahi, 2019). The use of animated media on chemical materials, namely electrolyte and non-electrolyte solutions, has a positive effect on critical thinking skills and student learning activities (Wahyuni, Emda, & Zakiyah, 2018). This is what makes the influence of using powtoon animation video media in the guided inquiry learning model. Students better understand the material presented by using animated powtoon media so that students' motivation and learning outcomes can increase. Several previous studies have also tried this animation media in the inquiry learning model, In addition, there are studies (Subhan, Salempa, & Danial, 2018) that there is a positive influence of the media animation in an inquiry learning model guided by thinking skills critical and learning activities of students inchemical equilibrium material.

4. CONCLUSIONS

Based on the results of the analysis and discussion of the research, it can be concluded that the animated powtoon media has a positive effect on the motivation and learning outcomes of students on chemical equilibrium material.

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