The Use of Instagram to Increase the Outcome in Learning the Reaction Rate in Chemistry Subject

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Abstract: The reaction rate is one of the abstract chemical materials so it requires visualization that can describe the reaction rate events in a more realistic way so that it is more easily understood by students. Visualization can help students be able to observe the symptoms that occur, collect data and draw conclusions from the videos or images presented and improve student learning outcomes. Social media such as Instagram is very possible to be applied in the chemistry learning process which requires visualization to explain some chemistry concepts like reaction rate. The use of Instagram can help students observe the symptoms that occur in the reaction rate through the videos or images presented. Instagram is considered very appropriate to be used to convey learning material that requires visualization to increase students' understanding. The research method used was quasi-experimental with the use of experimental class and control class and shaped Posttest-Only Design. Based on the results of the study, the learning outcomes in the cognitive domain average value of the experimental class was 80.83 and the average value of the control class was 73.83 with increased learning outcomes N-gain of 0.26. Assessment of learning outcomes in the affective and psychomotor domains with the use of final score on a scale of 1 to 4. Calculation of the final score uses the score comparison formula obtained with the maximum score multiplied by the maximum score. In the present study, a final score with an average affective and psychomotor score of 3.21 and 3.04 was obtained respectively.

Keywords: Instagram; Learning outcomes; Reaction rate; Social media

Introduction

The Ministry of Education and Culture has established a policy of learning from home through online learning. This step was taken as a response to slowing the rate of spread of the Covid-19 virus in the community (Sofie et al., 2022). Online learning is very possible given the current advances in internet technology which are developing very fast and making learning more effective and innovative (Kickmeier-Rust & Albert, 2010; Kim & Hannafin, 2011).

Choosing the right learning media greatly influences the success of the online teaching and learning process (Riyani, 2012; Alabdulkareem, 2015; Kolokytha et al., 2015; Boateng & Amankwaa, 2016; Giustini et al., 2018). Various kinds of social media platforms that are popular today that can be used as media in the teaching and learning process include Facebook, Twitter, Pinterest, YouTube and Instagram (Manca & Ranieri, 2016; Benko et al., 2016; Ali et al., 2017; Bal & Bicen, 2017; Chawinga, 2017a; Chawinga, 2017b; Blattner & Dalola, 2018). Various kinds of social media platforms that are popular today that can be used as media in the teaching and learning process include Instagram. Instagram is a very popular social media among teenagers today. Most Instagram users are teenagers in the age range of 16 to 24 years (Mandja, 2016; Mushlihah & Yetri, 2018; Abney et al., 2018; Erarslan, 2019; Irwandani et al., 2020).

Instagram has features such as feeds, direct messages, Insta Story and IGTV. The IGTV feature on Instagram allows educators to share long videos and users can set the privacy level of video uploads. In addition, IGTV is still ad-free. The use of Instagram is also very user friendly so it is easy to apply to teenagers. This makes it very possible for Instagram to be used as an online learning platform in chemistry subject matter of reaction rates for students in high school (Bexheti et al., 2014).

The reaction rate is one of the chemical materials that require students to have conceptual and factual knowledge. The material characteristics of the reaction rate which are abstract in nature require visualization that can describe the events and factors that affect the reaction rate more realistically so that they are more easily understood by students (Sukmawati, 2019).

Visualization can help students be able to observe the symptoms that occur, collect data and conclude the videos or images presented and it is hoped that chemistry learning will be more effective. Cognitive learning theory according to Bruner states that a good way to learn is to understand concepts, meanings, and relationships, through intuitive processes and finally arrive at a conclusion. Intuitive forms can be obtained from visual representations to solve problems (Edi, 2011; Hamalik, 2011; Djamarah, 2012; Elison, 2017; Hurst, 2018).

Instagram is very possible to be applied in the chemistry learning process which requires visualization to explain some chemical concepts such as reaction rates. It is believed that this can help achieve the minimum completeness score for the reaction rate material in the online learning process (Moore et al., 2013; Tuvi-Ardad & Blonder, 2018). The objectives to be achieved in this study are: Knowing the effect of the use of social media on learning outcomes in the cognitive domain of students in the reaction rate material, knowing the effect of using social media on learning outcomes in the affective domain of students in the reaction rate material and knowing the effect of using media social impact on students' psychomotor domain learning outcomes in the reaction rate material.

Method

The research method used was quasi-experimental using two classes in the form of an experimental class as the treatment class and a control class as the comparison, and was given a posttest. The research design used is shaped Posttest-Only. The population in this study were all students of class XI SMA 1 Seulimeum which consisted of 2 classes, namely XI IPA-1 with 30 students and XI IPA-2 with 30 students. The reason the researcher

determined the population of class XI IPA students was because the reaction rate material was taught in class XI. The sample in this study were students in class XI MIA-1 as the experimental class and XI MIA-2 as the control class. Class selection is done by purposive sampling by assuming the ability of all classes is the same result students' cognitive learning can be identified by using the instrument of multiple choice questions, the number of questions used is 20 multiple choice questions which have been tested and validated.

The research design used is shaped Posttest-Only Design with an overview of the design presented in Table 1.

Table 1. Research Design

Class	Treatment	Posttest
Experiment	X_A	O_A
Control	X_K	O_K

Information:
X_A : Treatment with the use of social media
X_K : Treatment without the use of social media
O_A : *Posttest* experimental class
O_K : *Posttest* control

Result and Discussion

The cognitive learning outcomes of students can be determined by using multiple choice questions, the number of questions used is 20 multiple choice questions which have been tested and validated. The learning outcomes of students in the cognitive domain can be seen from the overall value of the sample with an average value of the experimental class of 80.83 and an average value of the control class f 73.83 as shown in Table 2 below.

Table 2. Posttest Mean Value

Class	N	$\bar{x}$	σ	SEM
Experiment	30	80.83	10.75	1.96
Control	30	73.83	10.06	1.84

The different results obtained were estimated by the different treatments received by the two classes. Chemistry learning materials are still doctrinal, forcing educators to use media as a method of conveying learning. This is due to the way the human brain works stand does not support learning patterns that contain lots of lectures, the human brain is unable to concentrate on receiving information for more than 10 minutes.

Chemistry learning in design by utilizing Instagram social media trying to overcome this problem. There are several reasons why you should use Instagram social media as a learning medium. The reason why you have to take advantage of Instagram social media is because of the many features offered by Instagram as a

service that can be used by users in order to facilitate interaction, which these features can be used as learning media. Instagram media with its features will help students a little from boredom. With Instagram social media students will learn with various colour displays, and film images that are adapted to chemistry learning. This is very important because the characteristics of learning chemistry end make students in saturation and results in a loss of enthusiasm for learning (Herawati et al., 2013). This is in accordance with the function of the media, as according to Gagne and Briggs, namely learning media has a very important role as a tool to stimulate the learning process. Learning media is defined as anything that can be used to convey messages, and stimulate thoughts, feelings, attention and willingness of students so that they can encourage the teaching and learning process.

After the prerequisite test is carried out, the next step is the analysis test. As for what is used in this analysis test is the t-test. Study results from data for the experimental class was 30 students, while for the control class were 30 students. The average value of student learning outcomes or the mean for the experimental class is 80.83. Meanwhile, the control class is 73.83. Thus descriptive statistics can conclude there is a difference in the average student learning outcomes between the experimental class and the control class. Furthermore, to prove whether the difference is significant or not, it is necessary to do a t-test in this study using the help of the SPSS application (Independent Sample t Test).

Based on the output results analysis SPSS is known to value Sig. levene's test for equality of variances is equal to 0.628 > 0.05, which means that the variance of the data between the experimental class and the control class is homogeneous or the same. The results of the independent t-test show that the sig. (2-tailed) of 0.012 < 0.05, it can be concluded that there is a significant difference between the learning outcomes of students in the experimental class and the control.

Conclusion

There is a significant difference between the learning outcomes of students in the experimental class and the control class of students in the reaction rate subject. This is shown by the average value of student learning outcomes for the experimental class was 80.83 while for the control class was 73.83. Test results Independent Sample t Test known value themselves. (2 tailed) of 0.012 < 0.05, it can be concluded that there is a significant difference between the learning outcomes of students in the experimental class and the control class.

Conflicts of Interest
The authors assert that there is no presence of any conflict of interest.

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