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THE EFFECT OF ONLINE LEARNING VIA MICROSOFT TEAMS ON STUDENTS' LEARNING OUTCOMES IN THE REACTION RATE TOPIC AMONG GRADE XI SCIENCE STUDENTS OF SMA NEGERI 6 AMBON

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ABSTRACT

This study was conducted with the objective to find out the significant influence between learning *daring* using *microsoft teams* on the reaction rate material on the learning outcomes of class XI Science students at SMA Negeri 6 Ambon in the 2020/2021 school year. The population of this study were students of class XI IPA 2 and a sample of 16 people. Data collection techniques using interviews and questionnaires. The results showed that there was a significant influence between learning *daring* using *microsoft teams* on student learning outcomes. This is evidenced by the results of the regression equation Y = 10.857 + 0.315x. This means that if learning *daring* using *microsoft teams is* increased by 1 point, the learning outcomes will increase by 31.5%, which means H_0 is rejected and H_1 is accepted.

Keywords: *Online learning, rate reactions, learning outcomes*

INTRODUCTION

The influence of globalization has brought changes to all aspects of life, requiring humans to be capable of adapting to developments in every field, including education, science, and technology. Globalization has also led to positive changes, particularly the advancement of science and technology. These advancements have significantly affected the field of education, especially in terms of educational facilities and infrastructure used by teachers to support the learning process through online media in schools and educational institutions (Subekti et al., 2017).

Teachers serve as the front line of education, with responsibilities that include teaching, educating, providing direction and guidance, training, assessing and evaluating, as well as offering moral and emotional support to students. The teaching and learning process carried out by teachers in the classroom greatly supports learning activities, as it enables direct intervention when students experience difficulties in understanding concepts. However, along with technological advancements, the role of teachers has shifted throughout the learning process. Teachers no longer perform all teaching and mentoring tasks entirely in the classroom; instead, students are often assigned to access information independently and engage in group discussions to construct their own understanding. Online learning is a form of distance education conducted through the internet and supported by technological devices such as mobile phones and computers. The learning process can also be facilitated through applications that support online instruction. Video conference–based platforms such as Zoom Cloud Meeting, learning management system–based platforms such as Google Classroom, and Microsoft Teams are examples of online learning platforms that enable students to learn at the same time, even when they are in different locations (Bensalem, 2018).

Microsoft Teams is a service product within the Microsoft Office product line designed primarily for business environments, such as Hosting Exchange Server. Microsoft Teams can be utilized by teachers in educational services, including chemistry learning based on e-

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learning, enabling students to independently seek information through the use of information and communication technology via the internet in order to answer chemistry concepts both factually and conceptually.

Chemistry learning emphasizes providing direct experience to students so that they can discover concepts independently (Anita et al., 2013). Chemistry is a science that studies the composition, structure, and properties of substances or matter on the atomic to molecular scale, as well as the changes, transformations, and interactions involved in forming materials found in everyday life (Dwinata et al., 2016). The reaction rate topic is one of the chemistry topics taught in Grade XI, in which students are required not only to possess the ability to calculate and memorize information, but also to understand concepts closely related to reaction rates and gain direct experience through experimental activities. Through the use of process skills, learning becomes easier, more meaningful, and more engaging (Andromeda et al., 2018).

Based on the results of interviews with the chemistry teacher of Grade XI Science at SMA Negeri 6 Ambon, data on students' learning outcomes in the reaction rate topic during the 2020/2021 academic year showed an increase prior to the pandemic. Of the 16 students actively participating in learning, 15 students achieved mastery (minimum mastery criterion: 67), while 1 student did not. The obtained data demonstrate that students' mastery in the reaction rate topic reached 94%. This improvement occurred due to students' active participation during face-to-face learning, as the teacher provided direct instruction and guidance when students experienced difficulties in understanding the material. In contrast, the learning outcomes during online learning experienced a decline because students were confronted with a new condition requiring independent learning. The challenges faced by the chemistry teacher included poor internet connectivity, students' lack of access to smartphones, students' low level of engagement and responsibility during online learning, and limited instructional time.

The study conducted by Kristina et al. (2020) examined the implementation model of online learning as a substitute for face-to-face instruction in Lampung Province. This research employed a descriptive quantitative approach to identify the model of online learning implementation and its effect on students' learning motivation in Lampung Province. The population consisted of all students from elementary to senior high school levels, both from public and private institutions across Lampung Province. The sample included 109 students selected through simple random sampling, taking population homogeneity into consideration. The data collection instrument used a questionnaire consisting of both closed-ended and open-ended questions distributed through Google Forms. The questionnaire contained 12 questions related to the online learning variable and 10 questions related to the learning motivation variable. Data were analyzed using descriptive statistical analysis supported by computerized data processing.The results revealed that the most widely used online learning application in Lampung Province was WhatsApp (87.2%), followed by Google Classroom (41.3%), Google Meeting or Zoom (13.8%), and YouTube (15.6%).

The study conducted by Subekti et al. (2017) examined the use of video conferencing as an interactive learning medium in productive subjects at SMK Negeri 2 Prabumulih. The findings revealed that conventional learning processes resulted in the learning objectives not being achieved. Therefore, research was conducted by utilizing digital communication and technology in the form of video conferencing as an interactive learning medium to increase students' learning interest. The results of the study indicated that the use of video conferencing as an interactive learning medium demonstrated both practicality and effectiveness.

The study conducted by Sony et al. (2018) examined the optimization of Google Classroom as a learning medium at SMK Negeri 1 Bangkinang. Google Classroom, as an application specifically designed for online learning or virtual classrooms, enables teachers to easily create, distribute, and organize assignments without the use of paper. This activity made the learning process more effective, especially since teachers and students are able to interact face-to-face at any time through the Google Classroom virtual class. Through community service activities aimed at providing educational workshops on optimizing the use of Google Classroom within the environment of SMK Negeri 1 Bangkinang, this program was expected to support teachers in utilizing and implementing Google Classroom as a learning medium.

Several previous studies have shown that online learning using Microsoft Teams can be applied in chemistry instruction to enhance students' activity in discussion and access to

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chemistry concepts via the internet. Therefore, this research was conducted under the title, "The Effect of Online Learning Using Microsoft Teams on Students' Learning Outcomes in the Reaction Rate Topic among Grade XI Science Students at SMA Negeri 6 Ambon."

RESEARCH METHODS

This study employed a quantitative approach with a correlational research design aimed at determining the relationship between online learning using Microsoft Teams and students' learning outcomes on the reaction rate topic. The research was conducted at SMA Negeri 6 Ambon over the course of one month, from December 18, 2020, to January 18, 2021.

The population of the study consisted of all Grade XI Science students at SMA Negeri 6 Ambon, with a sample of 16 students from class XI IPA 2. The independent variable was online learning using Microsoft Teams, while the dependent variable was the learning outcomes on the reaction rate topic.

The instrument used was a Likert-scale questionnaire consisting of 14 items distributed through Google Forms. Data were collected through questionnaires and documentation of students' academic results.

The data were analyzed quantitatively using SPSS 16, including validity testing, reliability testing, classical assumption tests (normality, linearity, and homogeneity), and simple linear regression analysis.

RESULTS AND DISCUSSION

The purpose of this study was to determine the effect of online learning using Microsoft Teams on students' learning outcomes in the reaction rate topic among Grade XI Science students at SMA Negeri 6 Ambon.

A. Research Instrument Testing

1. Validity Testing

Table 1. Results of Instrument Validation

No	Statement	Significance	r_{table}	r_{count}	Qualification	Description
1	Online Learning Using Microsoft Teams on Reaction Rate Material	0,000	0,497	0,808	Very high correlation	Valid
2	Students are able to access the application easily and understand how to use it.	0,000	0,497	0,840	Very high correlation	Valid
3	The application can be used for group discussions.	0,000	0,497	0,805	Very high correlation	Valid
4	The interface of Microsoft Teams is clear and easy to understand.	0,001	0,497	0,749	High correlation	Valid
5	The online learning platform facilitates easy access to instructional materials and provides flexible options for submitting assignments.	0,000	0,497	0,788	High correlation	Valid
6	Using this application for learning is more convenient than using other platforms.	0,000	0,497	0,808	Very high correlation	Valid
7	This application makes it easy to store important material documents and assignments.	0,000	0,497	0,885	Very high correlation	Valid
8	This application enables me to complete assignments quickly during learning activities.	0,028	0,497	0,549	Moderate correlation	Valid
9	I am able to explain the concept	0,000	0,497	0,892	Very high	Valid

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No	Statement	Significance	r_{table}	r_{count}	Qualification	Description
	of reaction rate.				correlation	
10	I am able to understand the expression of the reaction rate in a chemical reaction.	0,002	0,497	0,723	High correlation	Valid
11	I am able to explain the occurrence of collision theory.	0,021	0,497	0,569	Moderate correlation	Valid
12	I am able to determine the reaction order.	0,000	0,497	0,801	Very high correlation	Valid
13	I am able to determine the rate law equation.	0,000	0,497	0,840	Very high correlation	Valid
14	I am able to conduct experiments on the factors that affect the reaction rate.	0,001	0,497	0,734	High correlation	Valid

According to Ridwan (2015), an item is considered valid if ($r_{count} < r_{table}$) at the 5% significance level. Conversely if ($r_{count} < r_{table}$), the item is considered invalid. Based on the results of the validity test, all items were found to be valid because ($r_{count} < r_{table}$) at the 5% significance level.

2. Reliability Test

Table 2. Summary of Reliability Test Results

Variable	Cronbach's Alpha	Standard Value	Conclusion
Online learning	0,904	0,600	Reliable
Learning outcomes	0,856	0,600	Reliable

Table 2 shows that the independent variable, online learning using Microsoft Teams, has a Cronbach's Alpha value of 0.904 with a standard value of 0.600, and is therefore considered reliable. Meanwhile, the dependent variable, learning outcomes, has a Cronbach's Alpha value of 0.856 with a standard value of 0.600, and is also considered reliable.

3. Normality Assumption Test

Table 3. Summary of the Normality Test Results

Variable	Asymp sig	Standard Value	Conclusion
Online learning	0,065	0,05	Normal
Learning outcomes	0,211	0,05	Normal

Table 3 shows that the independent variable, online learning using Microsoft Teams, has an Asymp. Sig value of 0.065 with a standard value of 0.05, and is therefore categorized as normal. Meanwhile, the dependent variable, learning outcomes, has an Asymp. Sig value of 0.211 with a standard value of 0.05, and is also categorized as normal. The results indicate that both tested variables are normally distributed, which is consistent with Sudarto (2012), stating that if the Asymp. Sig value is greater than 0.05, the data are considered normally distributed. Based on the test results for the independent variable—online learning using Microsoft Teams—the Asymp. Sig value is greater than the standard value 0,065 > 0,05 and is therefore categorized as normal, and for the dependent variable, learning outcomes, the Asymp. Sig value is greater than the standard value 0,211 > 0,05 and is also categorized as normal.

B. Linearity Test Analysis

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Table 4. Summary of Linearity Test Results

Variable	F Value	Sig	Alpha Value	Conclusion
X on Y	3.154	0,089	0,05	Linear

Table 4 shows that the independent variable (online learning using Microsoft Teams) and the dependent variable (learning outcomes) have a significance value of 0.089 with an alpha value of 0.05, and are therefore classified as linear. This result is consistent with Djazari (2013), who states that if the significance value of F is greater than 0.05, the relationship is considered linear.

C. Analysis of Homogeneity Test

Table 5. Summary of Homogeneity Test Results

Variable	Sig	Alpha Value	Conclusion
Online learning	0,380	0,05	Homogeneous
Learning outcomes	0,380	0,05	Homogeneous

Table 5 shows that the online learning variable using Microsoft Teams has a significance value of 0.380, and the learning outcomes variable also has a significance value of 0.380. Therefore, it can be concluded that the relationship between the independent variables and the dependent variable is homogeneous, as the significance value is greater than 0.05 (Kasmadi, 2013).

D. Effect of Online Learning Using Microsoft Teams on Students' Learning Outcomes in Reaction Rate Topics

Regression Model

Simple linear regression analysis is a statistical tool used to measure the effect of the independent variable (X) on the dependent variable (Y) (Sugiyono, 2011). The results of the statistical calculation show that the regression equation is expressed as y = a + b(x) in statistical computation y = 10,857 + 0,315x. The constant value of 10.857 indicates that if the online learning variable using Microsoft Teams is equal to 0, the average student learning outcome remains positive at 10.857. Furthermore, if students' scores in online learning using Microsoft Teams increase by 1 point, the dependent variable (learning outcomes) increases by 31.5%. This result demonstrates that learning using Microsoft Teams can improve students' learning outcomes. This finding is supported by Situmorang (2020), who stated that learning through Microsoft Teams for Education is highly effective in increasing students' learning interest.

The results indicate that online learning using Microsoft Teams led to an improvement in students' learning outcomes on the reaction rate topic. Based on the simple linear regression equation, it can be concluded that there is a positive effect of online learning using Microsoft Teams on students' learning outcomes. The significance value of 0.04 is lower than 0.05, indicating a positive influence of online learning using Microsoft Teams on learning outcomes. Therefore, H_0 is rejected and H_1 is accepted.

CONCLUSION

Based on the results of the study on the effect of online learning using Microsoft Teams on students' learning outcomes in the reaction rate topic for Grade XI Science students at SMA Negeri 6 Ambon, it was found that there is a positive and significant effect of online learning using Microsoft Teams on learning outcomes. The regression analysis yielded the regression equation Y = 10.857 + 0.315X. This means that if online learning using Microsoft Teams increases by 1 point, the learning outcomes will increase by 31.5%. Therefore, H_0 is rejected and H_1 is accepted.

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REFERENCES

Andromeda, Ellizar, Iryani, Bayharti, Yulmasari Yofita. (2018). Validitas dan Praktikalitas Modul Laju Reaksi Terintegrasi Eksperimen dan Keterampilan Proses Sains untuk Pembelajaran Kimia di SMA. Vol.2. No.2. FMIPA Universitas Negeri Padang.

Anita, N. Y.M., Karyasa, I. W., dan Tika, I. N., (2013). Pengaruh Model Pembelajaran Kooperatif Tipe Group Investigation (GI) Terhadap Self-Efficacy Siswa, *eJournal Program Pascasarjana Universitas Pendidikan Ganesha,* 3(1), 1-10.

Bensalem, E. (2018). The Impact of Whatsapp on EFL Students' Vocabulary Learning *Arab World English Journal (AWEJ)*.

Djazari, M. Rahmawati Diana. Nugraha Adhi Mahendra. (2013). Pengaruh Sikap Menghindari Resiko Sharing dan Konowledge Self-efficacy Terhadap Informal Knowledge Sharing pada Mahasiswa Fise Uny. *Jurnal nominal,* 2(2), 195-196.

Dwinata, R. A. Rusdi, E. Sal, P. Y. (2016). Rancang Bangun Aplikasi Tabel Periodik Unsur Dana Perumusan Senyawa Kimia Dari Unsur Kimia Dasar Berbasis Android. *Jurnal rekursif* 4(2).

Kasmadi, Sunariah, Nia Siti. (2013). *Panduan Modern Penelitian Kuantitatif*. Sukabumi : ALFABETA.

Kristina, M., Sari, R. N., & Nagara, E. S. (2020). Model pelaksanaan pembelajaran daring pada masa pandemi covid 19 di Provinsi Lampung. *Idaarah*, *4*(2), 200-209.

Ridwan, Abdullah. (2015). *Pembelajaran Saintifik untuk Implementasi Kurikulum 2013.* Jakarta: Bumi Aksara.

Sony, Afhdil Hafid, Hayami Regiolina, Fatma Yulia, Wenando April, Amien Al Januar, Fuad Evans, Unik Mitra, Mukthar Harun, Hasanuddin. (2018). Optimalisasi pemanfaatan *google classroom* sebagai media pembelajaran di SMK Negeri 1 *Bangkinang*, 2(1).

Sugiyono, (2011). *Metode Penelitian Kuantitatif, Kualitatif dan R & D*. Bandung. Alfabeta.

Situmorang, A. S. (2020). Microsoft teams for education sebagai media pembelajaran interaktif meningkatkan minat belajar. *Sepren*, *2*(1), 30-31.