THE EFFECTIVENESS OF *GUTINMATHE'S* IN BLOG-BASED LEARNING WITH A CONTEXTUAL APPROACH ON LINEAR EQUATION SYSTEM

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ABSTRACT

This study aimed to determine how effective the learning is using Gutinmathe's blog with a contextual approach. This research employed a quantitative approach and ADDIE Web development method, with analysis, design, development, implementation, and evaluation stages. The population in this study were Year 10 students of one of the vocational high School in Pandaan, Indonesia and the samples were Year 10 students majoring in Medical Laboratory Technology from the school. The data was analyzed using the paired-sample t-test conducted by SPSS. Gutinmathe's blog learning media was validated by two media expert lecturers and one teacher. The media validation score was 78.33%, meaning that the blog media is feasible to use. The results of this study indicate differences in learning outcomes before and after using the Gutinmathe blog-based learning media, where the students' post-test answers are better than the pre-test. It shows that using Gutinmathe's blog-based learning media with a contextual approach is effective.

ARTICLE INFORMATION

How to Cite

Inganah, S., Mahmulah, L., & Kusumawardana, A. S. (2022). The Effectiveness of Guitinmathe's in Blog-Based Learning With A Contextual Approach On Linear Equation System. *Kalamatika: Jurnal Pendidikan Matematika*, *7*(1), 85-98.

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INTRODUCTION

Due to Covid-19, offline learning that is usually applied has turned into online learning by utilizing technology (Sadikin & Hamidah, 2020). Technology-based learning is now the easiest access to improve the quality of education (Khusniyah & Hakim, 2019). In this case, internet information and communication technology created without any limits and time for any user can be used as one of the learning media that students can access. According to Rani & Maarif (2021), technology-based learning will facilitate the learning activities of each individual in online learning as a substitute for face-to-face learning. Aditya (2018) argued that one promising media is blog-based learning. This is in line with Prasetyo, et al. (2020) and Sartono (2016). They claimed that learning media using blogs as alternative learning media in schools is effective because it can increase student achievement and motivation.

To plan an effective and efficient online learning process, educators are required to create a new learning innovation to make learning not monotonous Prastiwi et al. (2020). This is also supported by Rahman (2020) who arguing that educators must carry out a learning strategy to overcome all the problems of online learning. However, online learning brings obstacles in grasping the concepts (Utami & Cahyono, 2020). This condition makes students choose to accept the situation and remain silent when they find learning material that is difficult to solve, especially in learning mathematics. It is supported by Ja'faruddin et al. (2020) stating that learning mathematics is often considered difficult with abstract, systematic, logical specifications, which require an effort to think critically.

Based on the observations and interviews with teachers at the school involved in this study, it is known that learning activities during the Covid-19 pandemic were carried out using the Google classroom platform and YouTube videos. Some students had difficulty understanding the concept so that they had not been able to solve System of Linear Equation with Three Variables (SLETV) problems using the elimination method and substitution even more, especially in term story. Azzahra & Pujiastuti (2020) and Mairing (2017)argued that the inability of students to understand problems in SLETV results in students not being able to make equations and complete SLETV calculations correctly. Therefore, researchers want to improve students' ability and learning outcomes on the material of the SLETV.

Responding to the problems, *Gutinmathe* was created as an option for learning mathematics media based on blog media with a touch of contextual approach Sufianto (2019)

claimed a contextual approach is believed to help students improve their ability to understand concepts by combining learning theory and the application of daily life. It is in line with Ulya et al. (2016), who argued that the contextual approach can expand students' interpretive skills compared to conventional approaches when learning mathematics takes place.

Several previous studies have discussed the SLETV, including Istini (2018), who studies the numbered heads together type of cooperative learning model with a scientific approach. Kuswanti et al. (2018) discussed student errors in solving SLETV problems. Cardo A.P. et al. research (2020) discusses students' difficulties in understanding concepts and solving SLETV contextual problems through elimination and substitution methods. In comparison, Dini, M., Muraeni, & Anita (2018) discussed how to improve students' mathematical understanding skills with a contextual approach to SLETV using student worksheets. This research is developed to support previous research. This research focuses on the effectiveness of online learning based on blog media with a contextual approach for learning SLETV.

This study aimed to determine how effective learning using *Gutinmathe* blog media with a contextual approach. *Gutinmathe* blog media was created by describing SLETV material characterized by a contextual approach that aims to make students accept the SLETV concept; improve students understanding and learners' mathematical communication skills. *Gutinmathe* blog media has benefits, namely, to overcome the problems of online learning through media-based learning media with a contextual approach. It is expected to support students in interpreting learning materials and achieve basic competencies by curriculum competency standards that have been made.

METHOD

This study is a Research and Development using a quantitative approach and the ADDIE Web development method, with the stages of analysis, design, development, implementation, and evaluation, as seen in Figure 1.
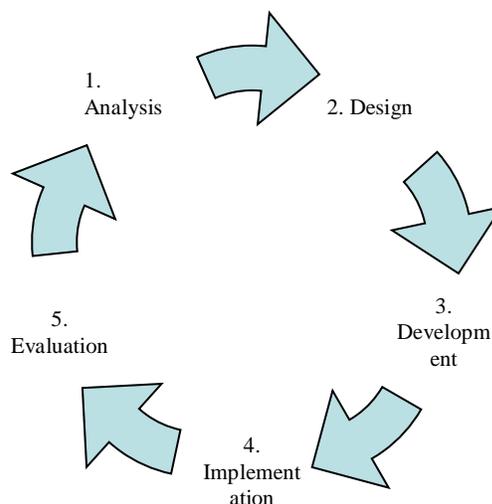
Figure 1. ADDIE Development Mode (Sari & Suswanto, 2017)

In the analysis phase, observations were carried out with interviews to identify problems in students' teaching and learning activities and identify the characteristics of students when learning took place. The design stage is the stage of designing media and preparing instruments and learning materials. A validation test is carried out in the development stage to determine whether the media is valid when teaching and learning activities occur. The implementation stage is implementing learning using the *Gutinmathe* for Year 10 students in the school studied. At the evaluation stage, it is the evaluation stage of the implementation of the *Gutinmathe* at the implementation stage. In this case, the evaluation was carried out by analyzing the data from the students' pre-test and post-test results to determine the effectiveness of the *Gutinmathe*. The data analysis technique was carried out using the t-test (Paired Sample t-Test) on SPSS, with the hypothesis that there was a difference in the average score of students after carrying out learning with *Gutinmathe* blog media with a contextual approach. The t-test (Paired Sample t-test) was also used to determine the difference in student learning outcomes after carrying out teaching and learning activities assisted by *Gutinmathe*. The learning outcomes are presented in Table 1.

Table 1. Categories of Learning Outcomes (Hikmah et al., 2018)

Score	Learning Result Category
0 – 20	Very Less
21 – 40	Less
41 – 60	Enough
61 – 80	Good
81 – 100	Very Good

RESULT AND DISCUSSION

Based on research on *Gutinmathe* blog media using the ADDIE development model, the following data were obtained.

1. In the stage of analysis, the researchers analyzed by doing an observation in the school to determine the problems in learning mathematics. The observation was done with interview to determine the learning methods and learning outcomes, the learning media used by students when teaching and learning activities take place online, and the sample used.

2. In the second stage, namely the design stage, based on the result of the analysis in the previous stage, researchers began to design for developing the learning tools in the form of *Gutinmathe* blog media. Meanwhile, at the stage of development, *Gutinmathe* blog media development was carried out, and the preparation of instruments that can assist online teaching and learning activities can increase students' learning motivation.
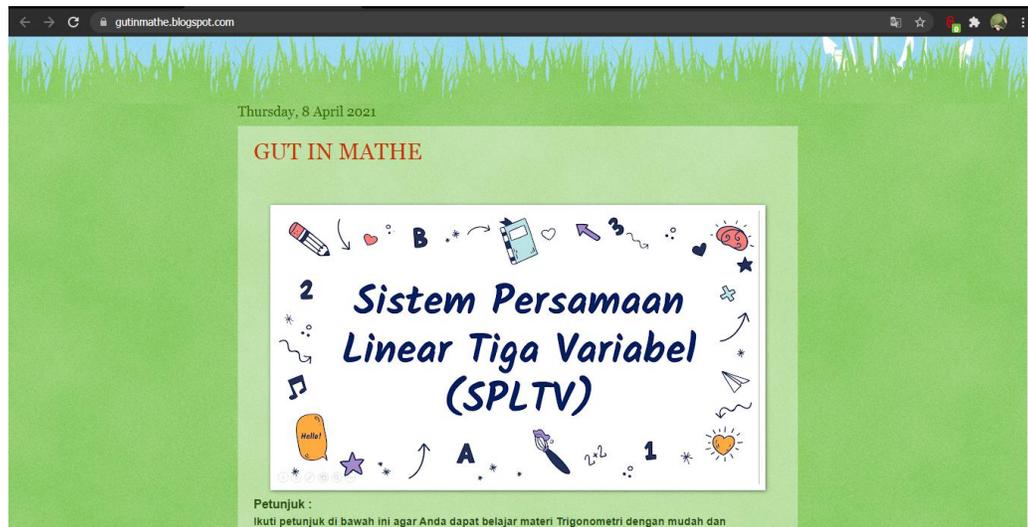

Figure 2. Initial Display of Media

The picture on the main page (see Figure 2) displayed when opening the blog media is the homepage display containing the learning sub-materials studied. Figure 3 shows a concept map display of the material to be studied; the purpose of giving a concept map is to show students the concepts and objectives of the material to be studied.
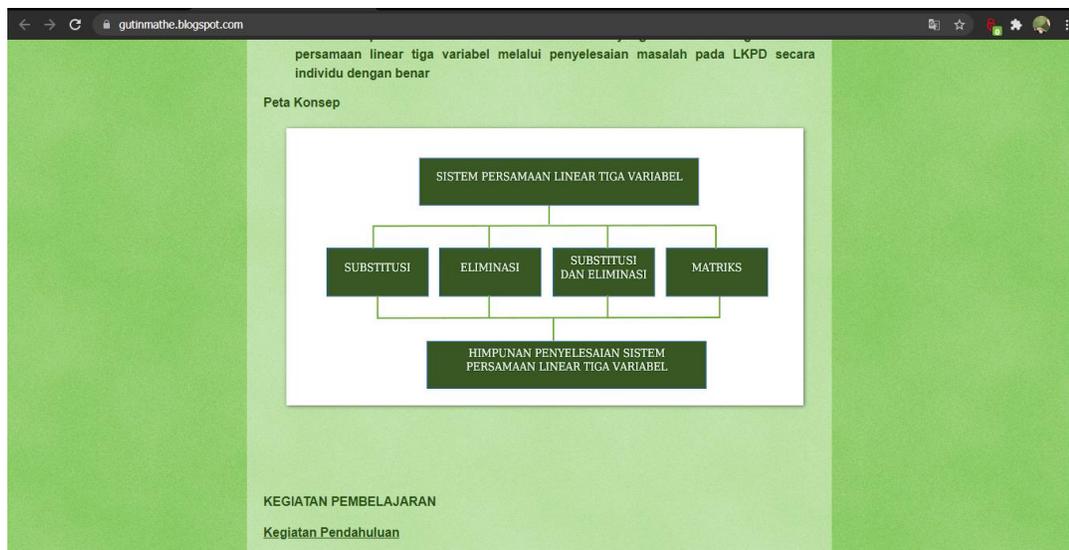
Figure 3. Concept Map Display

There is a display of the initial material page (Figure 4). In the initial material, there is motivation and a link given to access the pre-test to see students' ability.

Figure 4. Initial Material Page Display

Figure 5 shows the page display containing materials for SLETV. In this case, SLETV is packed with a contextual approach that can improve conceptual understanding of SLETV. Students can discuss several problems on the material page, namely learning activities 1, learning activities 2, and learning activities 3, along with the explanation video link.
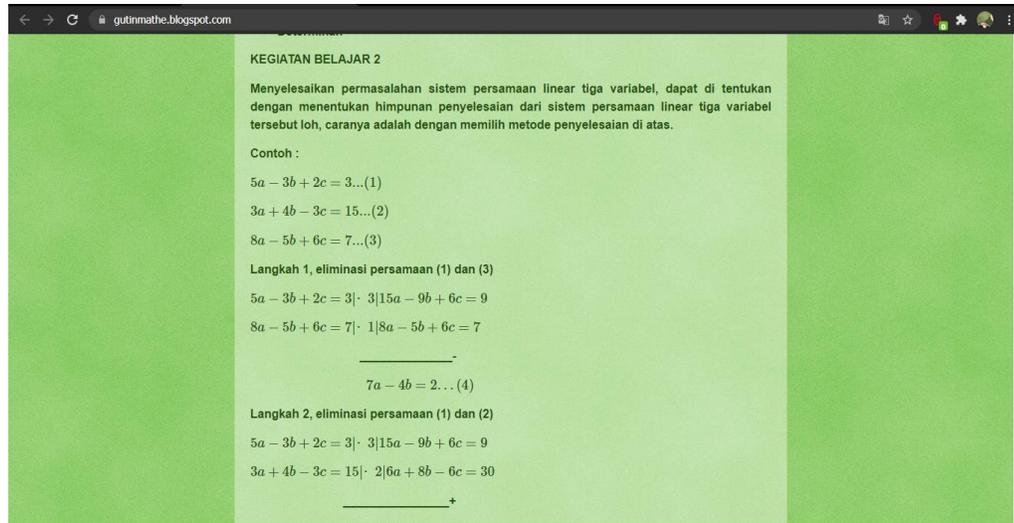
Figure 5. Material Page Display

Figure 6 presents the final display of the media contains motivation. It is also given a link to access the post-test to measure the ability of students to understand the SLETV.
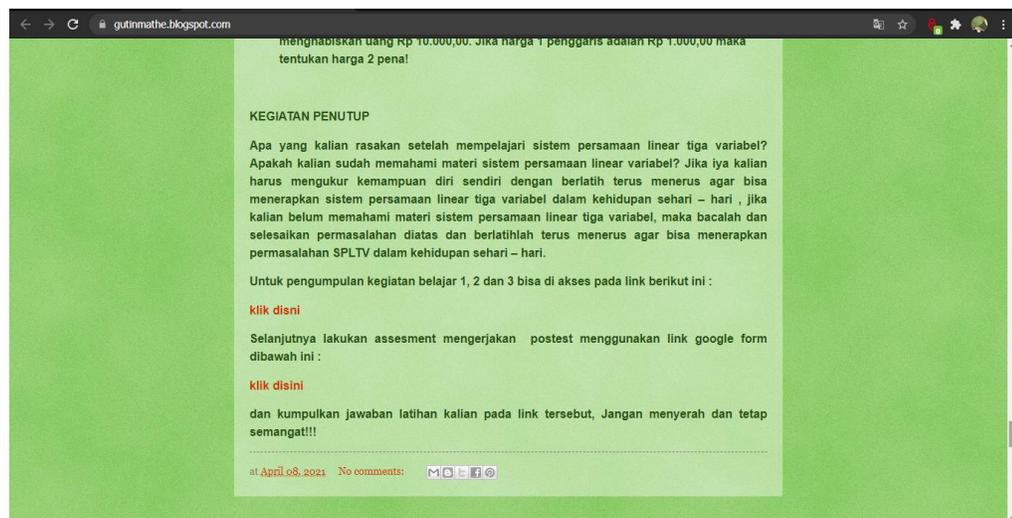

Figure 6. Media Final Display

3. At the development stage, validation was carried out by two media expert lecturers and one teacher, with validation score being 78.33%. It shows that the *Gutinmathe* blog-based learning media with the *Gutinmathe* contextual approach is valid to be implemented when teaching and learning activities take place.

4. At the implementation stage, learning is carried out using the *Gutinmathe* blog media for sample students.

5. At the evaluation stage, an analysis of the results of the learning implementation activities at the implementation stage is carried out. Some students' answer sheets solving the problems of SLETV in the *Gutinmathe* blog media are presented in Figure 7, Figure 8, and Figure 9.
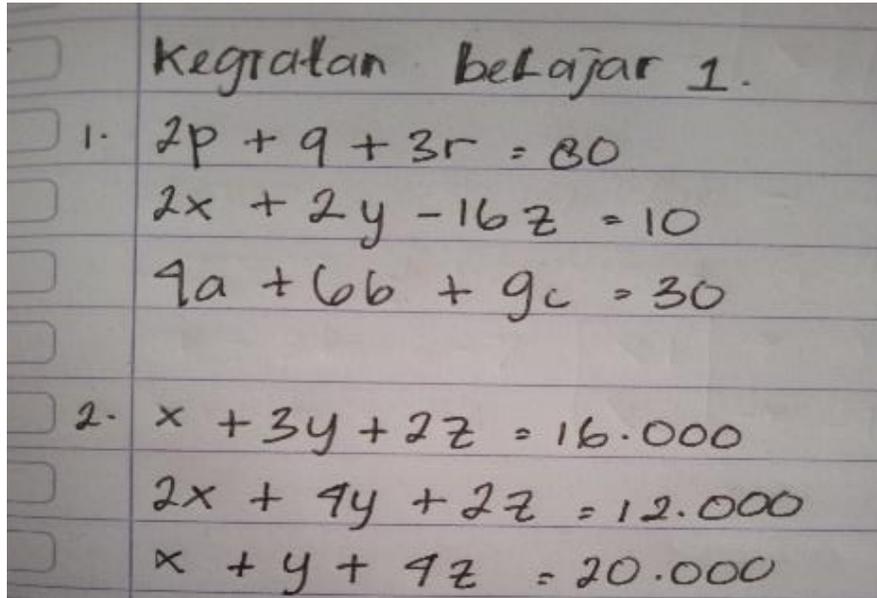

Figure 7. Students' answers are good at learning activities 1

Figure 7 shows that students can apply the discussion of contextual problems and write them according to the notation of the SLETV. So, it can be concluded that students can understand the SLETV concept correctly.
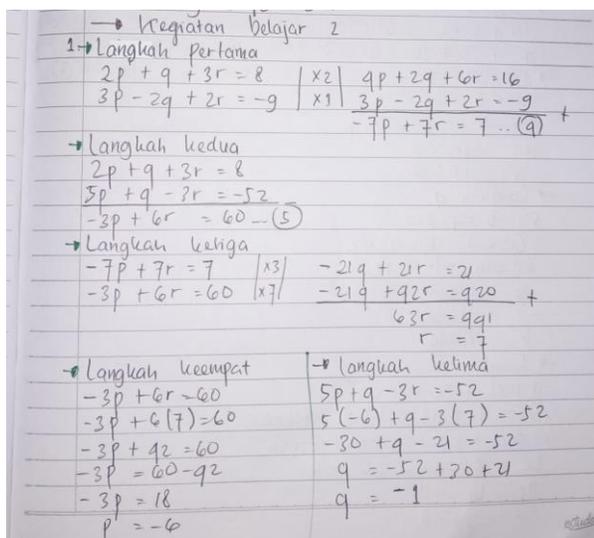

Figure 8. Students' answers are good at learning activities 2

Figure 8 shows that students can apply contextual problems and solve the SLETV problems using the elimination and substitution methods. Thus, students have achieved the ability to understand concepts and solve SLETV problems.
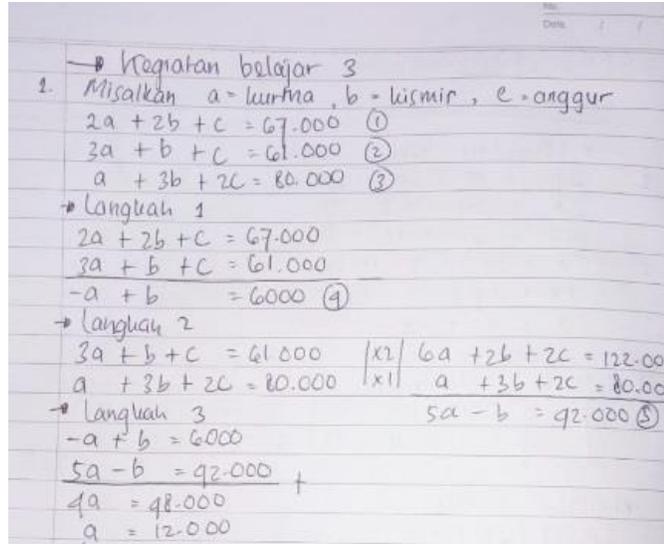

Figure 9. Answers of capable students are in learning activities 3

Figure 9 shows that these students cannot solve contextual problems in learning activities 3. The answers written are not relevant to the problems that are given. Therefore, it can be concluded that these students have not been able to solve contextual problems in learning activities 3.

Based on the data in the study, analysis was carried out, and the student learning outcomes before and after learning using the blog media *Gutinmathe* were presented in Figure 10.
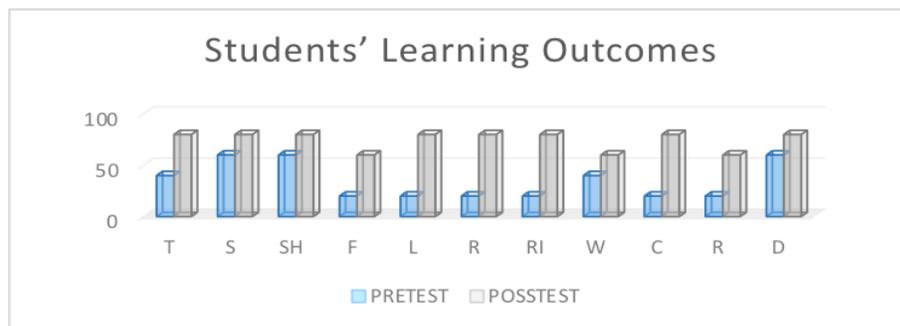

Figure 10. Graph of Student Learning Outcomes

When the t-test (Paired Sample t-test) was performed on SPSS and the results are presented in Tables 2 and 3.

Table 2. Descriptive Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pre-Test	34.55	11	18.091	5.455
Post-Test	74.55	11	9.432	2.817

Table 3. Paired sample t-test results

	Paired Difference							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2 – tailed)
				Lower	Upper			
Pre-test – Posttest	-40.000	17.889	5.394	-52.018	-27.982	-7.416	10	.000

Figure 10 shows the difference in student learning outcomes before and after using *Gutinmathe's* blog media. Table 2 indicates the mean of pre-test score is 34.55, while it is 74.55 for the post-test. Based on these data, it can be seen that the students' post-test learning outcomes is better than the pre-test. Table 3 shows significant different between pre-test and post-test (p= 0.000), meaning that H0 is rejected and H1 is accepted. So, it can be concluded that there is a difference in students' learning outcome after carrying out learning using *Gutinmathe* media blogs with a contextual approach.

Based on these data, the results obtained are *Gutinmathe* blog media-based learning with a contextual approach is effective. Learning based on *Gutinmathe's* blog media can help to improve understanding skills and learning outcomes of Year 10 students in this study. A similar study conducted by (Lehtonen et al., 2020). Lehtonen et al. (2020) found that technology-based learning in learning linear equations could support conceptual understanding and language and improve learning achievement. Similarly, research conducted by Dini, M., et al. (2018)reported that learning mathematics with a contextual approach can improve students' understanding abilities and achieve performance indicators prepared previously. It is also supported by Cardo A.P. et al. (2020) stating that contextual problem-based learning is an alternative to overcome the problems of SLETV so that students can solve contextual problems well. In addition, the research by Sugandi & Benard (2018) revealed that the ability and potential of students in understanding learning materials and students' mathematical communication have improved.

CONCLUSION

Gutinmathe blog media is a blog-based learning media used to facilitate online learning activities. The advantages of the *Gutinmathe* blog media are that it is easily accessible by students. It also has basic competencies, indicators, concept maps, video explanations of

learning material for SLETV, as well as learning activities 1, learning activities 2, and learning activities 3 as a form of evaluation of learning daily. In the *Gutinmathe* blog media, there are also pre-test and post-test links that are used to measure the ability of students and see how effective the *Gutinmathe* blog media is when used. However, the *Gutinmathe* blog media also has some drawbacks. It is susceptible to viruses and easy to abuse.

In this study, the media blog was created with a touch of contextual approach. In this case, students can understand the concepts in learning activities 1. Students can solve contextual problems using elimination and substitution methods in learning activities 2. Students have not been able to solve contextual problems in learning activities 3. Based on the learning outcomes, students' outcomes after the learning assisted by blog media were improved. Students who get high post-test scores are considered to have been able to accept concepts and solve contextual problems on SLETV. In conclusion, research with *Gutinmathe* blog media with a contextual approach is effective for online and offline learning. However, some students have not been able to solve contextual problems. Therefore, this research needs to be developed and further studied.

ACKNOWLEDGMENTS

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