JPPIPA 12(4) (2026)

Jurnal Penelitian Pendidikan IPA

http://jppipa.unram.ac.id/index.php/jppipa/index

Improving Students' Disaster Preparedness Using Android-Based Science E-Modules with the SETS Approach

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Received: September 23, 2025
Revised: March 02, 2026
Accepted: April 25, 2026
Published: April 30, 2026

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DOI: 10.29303/jppipa.v12i4.12931

Abstract: Schools become high-risk areas in the event of an earthquake. This study aims to determine the increase in students' disaster preparedness through Android-based science e-modules using the SETS approach. This quasi-experimental study was conducted with a pre-test and post-test control group design. The subjects of this study were 61 eighth-grade students at an Islamic junior high school in Yogyakarta, selected through purposive sampling. The data collection instrument in this study consisted of 10 multiple-choice test items assessing disaster preparedness indicators, including knowledge and attitude, policies and guidelines, disaster response plans, early warning systems, and mobilization. Data analysis in this study used the gain standard equation to see the increase in student disaster preparedness. The findings of this study indicate that the normality test results for the control and experimental classes, for both pre-test and post-test, are significant at the 0.05 level, indicating that the data in both classes are normally distributed. The results for the experimental class showed a 70% increase in student disaster preparedness, falling into the high category, while the control class was 50%, in the medium category. These findings indicate that using Android-based science e-modules with the SETS approach can significantly increase student disaster preparedness.

Keywords: Android; Disaster preparedness; Learning innovation; Science e-module; SETS approach

Introduction

As a country in the Pacific Ring of Fire, Indonesia often experiences severe natural disasters, including earthquakes, tsunamis, and volcanic eruptions. Almost the entire Indonesian archipelago is vulnerable to large and small earthquakes. The most susceptible areas include Aceh, North Sumatra, West Java, Bali, and Papua, while in parts of Kalimantan, no earthquake sources were found (Siagian et al., 2014). One example of a tragic event is the earthquake on May 27, 2006, with a magnitude of 6.3 on the Richter Scale, which rocked the Special Region of Yogyakarta and parts of Central Java. This earthquake caused 5,800 deaths; more than 37,000 were injured, and thousands of houses were damaged to varying degrees (Seeberg & Padmawati, 2021). The cause is the movement of the Opak Fault, which runs from the coast of Bantul to Prambanan (Bronto et al., 2023).

According to the disaster risk map, several sub-districts in Yogyakarta are highly vulnerable to earthquakes, including Kasihan, Bantul, and Pleret. These sub-districts are located along the Opak Fault, increasing their vulnerability to earthquakes (Hizbaron et al., 2012). Data from more than the last 30 years shows that earthquakes are one of the disasters that cause the most victims in Indonesia, with thousands of people dying. This fact emphasizes the importance of implementing disaster preparedness in schools, especially in earthquake-prone areas. The 2018 Indonesian Disaster Risk Index shows that 16 provinces in Indonesia are in the high disaster risk class, while 18

How to Cite:
Putranta, H., Yuliatun, T., Uskenat, K., & Reski, A. (2026). Improving Students' Disaster Preparedness Using Android-Based Science E-Modules with the SETS Approach. *Jurnal Penelitian Pendidikan IPA*, *12*(4), 147–156. https://doi.org/10.29303/jppipa.v12i4.12931

other provinces are in the medium risk class (Supriyadi et al., 2018). This indicates the need for extra attention to building disaster preparedness in schools, where many highly vulnerable people gather during disasters.

These disasters not only threaten human lives but also cause significant economic damage. Disaster preparedness is crucial for reducing the negative impacts of natural disasters and strengthening community resilience (Kapucu et al., 2013). Education is recognized as an essential tool in building disaster preparedness among students. Furthermore, disaster education provides knowledge of disaster risk and mitigation and trains students in practical skills they can use to handle emergencies. However, disaster education in schools still needs improvement, as the curriculum is poorly integrated, resources are limited, and there are differences in readiness levels between students and teachers (Johnson et al., 2014). Apart from that, the teaching materials used in schools, such as e-modules, only facilitate disaster preparedness.

The use of Android-based e-modules to improve disaster preparedness in Indonesia still needs improvement, despite this technology's great potential to strengthen disaster education (Saputro & Afni, 2023). The e-module allows students to study independently and access the latest information about disasters, which is crucial for increasing their understanding of risk and mitigation. In science education, students' low knowledge competency can be influenced by certain factors, including less supportive learning models. A learning process based on science, environment, technology, and society (SETS) can offer students opportunities to learn through direct observation and disaster simulations, fostering a deeper understanding of how to respond to natural disasters (Kitagawa, 2021).

Although Android-based e-modules offer high flexibility and accessibility for learning, the main challenge is inconsistent implementation across schools in Indonesia. However, integrating SETS with Android-based e-modules can increase students' preparedness for disasters (Ronan et al., 2015). This approach provides theoretical knowledge and trains practical skills relevant to emergencies (Krasnyansky et al., 2020). The importance of developing and implementing Android-based e-modules in disaster education lies in increasing students' understanding of disasters and preparing them to face increasingly complex disaster threats in the future. Thus, efforts to improve the use of technology in disaster education need to be encouraged through progressive education policies and adequate infrastructure support throughout Indonesia.

This technology allows students to learn independently and access the latest information, which is crucial in responding to emergencies (Ferri et al., 2020). With full support from various parties, integrating e-modules can be significant in building a more prepared and resilient generation in natural disasters. In addition, the SETS approach integrates multiple scientific disciplines to understand the complexity of natural disasters, offering a holistic framework that emphasizes theoretical aspects and encourages the development of critical thinking skills and practical solutions. In the context of disaster education, integrating SETS with Android-based e-modules can create a more relevant and valuable learning experience. Students gain a theoretical understanding of disasters and are trained to apply their knowledge in real situations through interactive simulations and scenarios (Peek & Guikema, 2021). Thus, this research has the potential to significantly contribute to the development of disaster education policies in Indonesia and other countries that are vulnerable to natural disasters. Integrating SETS with Android-based e-module technology can create an educational model that is more adaptive and responsive to future disaster challenges.

Method

Research Design

This research adopted a quasi-experimental design with two class groups: the control and experimental classes. The quasi-experimental design was a pre-test and post-test group control (Tarhan et al., 2020). This research evaluates the effectiveness of Android-based science e-modules using the SETS approach for student disaster preparedness. Overall, this research is expected to provide concrete scientific evidence on the benefits of using technology, in the form of Android-based e-modules, and the SETS learning approach in disaster education. It is also hoped that the results of this research can provide recommendations for education stakeholders and policymakers to improve learning methods that are adaptive and responsive to future disaster challenges. The research design is shown in Table 1.

Table 1. Quasi-Experimental Research Design

Group	Pre-test	Treatment	Post-test
Experiment	X_1	O_1	X_2
Control	X_1	O_2	X_2

Based on Table 1, X_1 is an initial test measuring students' disaster preparedness before treatment. This test was applied to the experimental and control classes to determine students' initial level of preparedness before receiving any treatment. By conducting this initial test, baseline data are obtained that will be used to compare results after treatment. Next, X_2 is the final test measuring students' disaster preparedness after treatment. This final test was also applied to both groups, namely the experimental and control classes. In the experimental class, students received treatment through learning with Android-based science e-modules using the SETS approach.

Meanwhile, the control class received treatment using modules provided at school. The results of this final test will be compared with those of the initial test to assess the intervention's effectiveness. Furthermore, O_1 is the treatment administered to the experimental class, which learns using Android-based science e-modules with the SETS approach. This learning experience is designed to improve students' disaster preparedness through interactive, technology-based methods. Meanwhile, O_2 is administered to the control class using standard school modules. A comparison of the results from the experimental and control classes after treatment will show that learning with Android-based science e-modules using the SETS approach is more effective at improving students' disaster preparedness than conventional learning methods.

Participant

This research involved all class VII students at MTs Al Ikhlas Berbah, Yogyakarta, consisting of six classes. Each class has 32 students, so the research population is large and representative. The research sample was selected using purposive sampling. The selected sample consisted of class VII A as the experimental class and class VII B as the control class. The study used purposive sampling (Palinkas et al., 2015). The total number of samples from the two classes was 66 students. In this research, the control class used PowerPoint text media as treatment, while the experimental class used Android-based science e-modules with the SETS approach. The SETS approach in the science e-module is designed to enhance learning effectiveness by providing more interactive and engaging technology for students. Meanwhile, the Android-based science e-module, which uses the SETS approach in this research, is presented in Figure 1.

The Android-based science e-module using the SETS approach comprises three framework sections. The introductory section contains information students need, including cover, foreword, menu, essential competencies, objectives, and concept map. The core part includes video content, assessments, and goals to be achieved. The concluding section presents a bibliography and glossary. The e-module used in this experimental class indicates that this research focuses on content and innovative delivery methods aligned with technological developments.

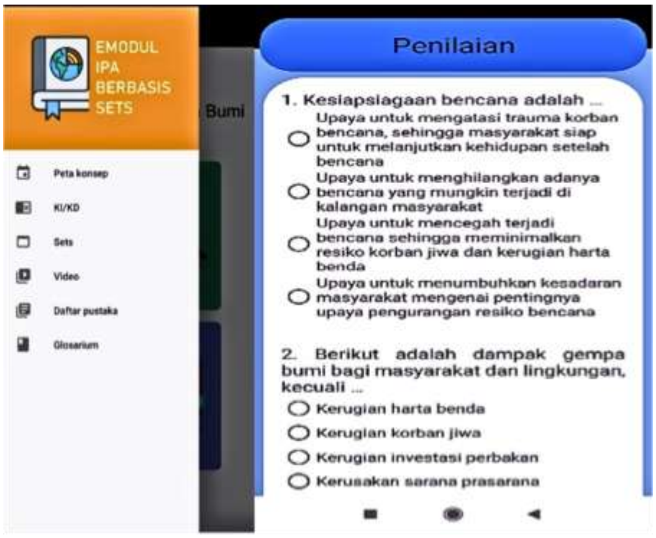

Figure 1. Android-based science e-module using the SETS approach

Research Instruments and Procedures

The research instrument was a test consisting of multiple-choice questions on disaster preparedness. To assess the implementation of learning according to the provided learning implementation plan, use the learning implementation observation sheet. To measure disaster preparedness abilities, use a written test consisting of 10 questions with a disaster-preparedness indicator rubric that includes knowledge and attitudes, policies and guidelines, disaster response plan, early warning system, and mobilization. The grid of multiple-choice questions on disaster preparedness is shown in Table 2.

Table 2. Disaster Preparedness Test Question Grid

Disaster Preparedness Aspects	Disaster Preparedness Indicators	Number of Items
Knowledge and attitudes towards disaster risk	Knowledge about actions during a disaster	3
	Knowledge of disaster management	
	Attitudes towards disaster risk	
Early warning system	Dissemination of warnings and mechanisms	3
	Practice and simulation	
Plan for disaster emergencies	Evacuation plan	2
	First aid, rescue and security	
Resource mobilization	Organizing	2
	Command system for evacuation	
Number of Question Items		10

This research stage began with both the control and experimental classes being given the same pre-test. This pre-test measures students' initial understanding of disaster concepts and basic science knowledge before providing the intervention. Identical pre-tests ensured that both groups had comparable initial understanding before they engaged in the intervention under study (Neuman et al., 2011). After the pre-test, the experimental class received an intervention using an Android-based science e-module based on the SETS approach. This intervention is designed to increase students' understanding of science concepts relevant to disasters and their preparedness for natural disasters. The e-module used in this research is intended to present integrated information between science, environment, technology, and social aspects of society (SETS), thereby increasing student engagement and practical application of their knowledge.

On the other hand, the control class did not receive intervention using Android-based science e-modules with the SETS approach during the research period. The control class continues with its routine learning process. This aims to compare changes in the experimental class with those in the control class to assess the extent to which the use of e-modules and the SETS approach has significantly impacted students' disaster preparedness. After the intervention, both groups were again given a post-test identical to the previous pre-test. Following appropriate interventions, this post-test evaluates students' increased understanding and disaster preparedness. The effectiveness of Android-based science e-modules using the SETS approach in improving students' disaster preparedness can be assessed by comparing pre-test and post-test scores between the two groups.

Data Analysis

Analysis of learning implementation in this research uses the interjudge agreement (IJA) method, as shown in equation (1). The IJA method is used to determine the extent to which observations from several judges regarding the implementation of learning show suitability or consistency (Utami et al., 2021). In this context, the IJA percentage is calculated based on the agreement between assessors on the aspects observed during the lesson's implementation. If the IJA percentage exceeds 75%, the learning activity is considered well carried out. This shows that most assessors agree that the learning process follows the learning implementation plan and meets the established criteria.

$$IJA = \frac{A_y}{A_y - A_N} \times 100\% \quad (1)$$

Based on equation (1), Ay represents an activity carried out, and AN represents an activity not carried out. The IJA method provides a systematic and objective way to evaluate the implementation of learning. The high IJA percentage of over 75% indicates that the learning process runs effectively and according to plan. This method also helps identify areas that require improvement if the IJA percentage is below a set threshold, making it possible to make necessary adjustments to improve the quality of learning. Before conducting tests to increase disaster preparedness using the n-gain equation, a series of prerequisite tests must be conducted to ensure the data meet the required statistical assumptions. The first prerequisite test is the normality test using the Shapiro-Wilk method. This test assesses whether the data follow a normal distribution (González-Estrada et al., 2022). Next, a test of homogeneity of variances was conducted using Levene's test, which assesses the similarity of variances across groups (Ntumi, 2021). Hypothesis testing was also conducted on the pre-test and post-test results from the experimental and control classes to determine whether there were significant differences between the two groups before and after the intervention. Pre-test and post-test analyses using the n-gain equation were conducted to evaluate the increase in students' disaster preparedness, as shown in equation (2).

$$g = \frac{\bar{x}\ skor\ postest - \bar{x}\ skor\ pretest}{100 - \bar{x}\ skor\ pretest} \quad (2)$$

The n-gain equation is calculated, then categorized into three levels based on the level of improvement achieved. The high category is set for N-gain values greater than or equal to 0.70, the medium category for N-gain values between 0.30 and 0.70, and the low category for N-gain values less than 0.30 (Doyan et al., 2022). This equation helps quantify and understand disaster preparedness more precisely and objectively. Carrying out this prerequisite test can ensure that the data obtained is suitable for further analysis and that the results produced are reliable. This N-gain analysis also provides in-depth insight into the effectiveness of the intervention for the experimental class compared with the control class.

Result and Discussion

Implementation of Disaster Preparedness Learning Using Android-Based E-Modules with the SETS Approach

The learning in this research was conducted over two meetings, each lasting three hours. In the control class, learning is carried out using PowerPoint-based learning media, implemented through a scientific learning approach and discovery models. This approach emphasizes a scientific learning process and encourages students to discover concepts through structured exploration and investigation. On the other hand, the experimental class uses Android-based learning media combined with the SETS (science, environment, technology, and society) approach. The SETS approach integrates scientific concepts with environmental, technological, and social aspects to make learning more relevant and applicable to students.

Meanwhile, two independent observers measured the implementation of the learning plan. The results of these observations were then analyzed using the interjudge agreement method to ensure consistency among assessors. Table 3 shows the percentage of implementation of the learning plan, analyzed using interjudge agreement.

Table 3. Percentage of Learning Plan Implementation

Meeting	Implementation Percentage (%)		Average (%)
	Observer 1	Observer 2	
First	93.3	80.0	86.7
Second	93.3	86.7	90.0

Table 3 shows that the % of learning Implementation using Android-based science e-modules with the SETS approach at the first meeting was recorded at 86.7%. This indicates that most of the learning implementation plans were carried out as planned at the first meeting. This high percentage suggests that most learning components, from material delivery to learning activities, have been implemented well. The use of Android-based e-modules is also effective in helping teachers implement the learning process according to the prepared plans. Meanwhile, the second meeting showed that the percentage of learning implementation had increased to 90.0%. This increase indicates improved implementation of the learning plan compared to the first meeting. This is due to the adaptation of teachers and students to using Android-based e-modules, enabling them to carry out learning more smoothly and efficiently at the second meeting.

Results of Normality and Homogeneity Tests for Disaster Preparedness Learning in Experimental and Control Classes

This percentage increase indicates that the SETS approach used in e-modules is increasingly influential in integrating science, environmental, technological, and social aspects into the learning process. The students' disaster preparedness achievements were evaluated using pre-tests and post-tests administered before and after the intervention with the Android-based science e-module and the SETS approach. Before being used in research, the disaster preparedness questions were tested for normality using the Shapiro-Wilk analysis to ensure that the data obtained were normally distributed. This normality test is essential for determining the appropriate statistical test. The results of the instrument's normality test are presented in Table 4.

Table 4. Data Normality Test Results

Group	Kolmogorov Smirnov			Shapiro-Wilk		
	Statistic	df	Sig	Statistic	df	Sig.
Experimental Pre-test	0.113	33	0.200	0.966	33	0.427
Experimental Post-test	0.152	33	0.076	0.987	33	0.217
Control Pre-test	0.106	33	0.200	0.989	33	0.988
Control Post-test	0.144	33	0.117	0.944	33	0.432

Based on normality test data using the Shapiro-Wilk analysis, the pre-test significance values for the control and experimental classes were 0.988 and 0.427, respectively. Both values exceed the 0.05 threshold, indicating that the pre-test data for both classes are normally distributed. This normal distribution is important because it indicates that the pre-test results of the two groups of students do not deviate significantly from normality, thus meeting the basic assumptions for conducting further parametric statistical tests. In addition to the pre-test, a normality analysis was conducted on the post-test data for both classes. The normality test results showed that the post-test significance values were 0.432 for the control class and 0.217 for the experimental class. These two values are also greater than 0.05, indicating that the post-test data for both classes are approximately normally distributed. Thus, the normal distribution of the post-test results indicates the consistency and validity of the data obtained after the intervention, in both the control and experimental classes. This facilitates comparative analysis of the increased understanding between the two classes after the intervention. Meanwhile, the results of the Levene test can be shown in Table 5.

Table 5. Levene's Test of Equality of Error Variance

Variable	f	dfl	dfl	Sig.
Disaster Preparedness	.144	1	58	0.706

Based on Table 5, the significance value obtained from Levene's test of equality of error variance is 0.706. Levene's test assesses the equality of variances (homogeneity) between the control and experimental data groups. The significance value of 0.706 is much greater than the threshold of 0.05, which means that the error variance between the two groups is not significantly different. In other words, the assumption of homogeneity of variance is met, allowing the use of additional parametric statistical tests for data analysis.

Results of Improving Students' Disaster Preparedness in Experimental and Control Classes

Meeting the assumption of homogeneity of variance is essential in experimental research because it indicates that the control and experimental groups have similar variability. This ensures that comparisons between groups are not influenced by differences in error variance, making the analysis results more valid and reliable. Meanwhile, the results of increased students' disaster preparedness in the experimental and control classes are shown in Table 6.

Table 6. Results of Increased Disaster Preparedness

Group	Participants	Avergae		N-gain	Category
		Pre-test	Postest		
Experiment	33	25	79	0.7	High
Control	33	27	64	0.5	Moderate

Table 6 shows that the increase in disaster preparedness among students in the experimental class was 0.7 (70%), which falls within the high category. This significant increase shows that using Android-based science e-modules with the SETS (science, environment, technology, and society) approach effectively improves students' disaster preparedness. The SETS approach, which integrates scientific concepts with environmental, technological, and social aspects, helps students better understand the material and its relevance and apply it in real-world contexts related to disaster preparedness. The results show that the use of technology in learning, especially Android-based e-modules, can significantly impact students' understanding and disaster preparedness. On the other hand, the increase in students' disaster preparedness in the control class was only 50%, which falls within the medium category. Even though there has been an increase, these results show that the traditional learning approach, which uses PowerPoint media with a scientific learning approach and model discovery, is less practical than using Android-based e-modules.

Discussion

The learning in this research was conducted over two meetings, each lasting three hours. Learning in the control class uses PowerPoint-based learning media, implemented through a scientific learning approach and discovery models. The scientific learning approach involves students in a learning process based on scientific steps, while the discovery model encourages students to discover concepts independently through exploration and investigation (Sutiani et al., 2021). Furthermore, the discovery learning model effectively enhances students' conceptual understanding by actively engaging them in the learning process. On the other hand, the experimental class uses Android-based learning media combined with the SETS (science, environment, technology, and society) approach. The SETS approach integrates scientific concepts with environmental, technological, and social aspects to make learning more relevant and applicable to students. Android-based learning media deliver more interactive and engaging content that students can access anytime, anywhere. In addition, the use of mobile technology in learning can increase student engagement and facilitate more flexible, personalized learning (Whalley et al., 2021).

The percentage of science learning implementation in the experimental class at the first meeting was 86.7%. This percentage indicates that most learning implementation plans have been carried out as planned. This high percentage indicates that most learning components, from material delivery to learning activities, have been implemented well. High learning implementation indicates effective implementation of the learning plan and alignment between planning and implementation in the classroom (Iqbal et al., 2021). At the second meeting, the percentage of learning implementation increased to 90.0%. This increase indicates improved implementation of the learning plan compared to the first meeting. This is due to the adaptation of teachers and students to using Android-based e-modules, enabling them to carry out learning more smoothly and efficiently at the second meeting. This percentage increase indicates that the SETS approach used in e-modules is increasingly influential in integrating science, environmental, technological, and social aspects into the learning process. In line with this statement, the use of technology in learning can help students better understand the material and improve their learning outcomes (Wekerle et al., 2022).

Implementing learning using Android-based learning media and the SETS approach has proven more effective than PPT-based learning media, scientific learning approaches, and discovery models in the control class. The increase in the implementation percentage from the first to the second meeting in the experimental class reflects adjustments by the teacher and students. This indicates that using technology and a comprehensive approach, such as SETS, in learning can increase learning effectiveness and student engagement. Meanwhile, technology can be a powerful tool in learning, providing a richer and more meaningful learning experience for students (Kumi-Yeboah et al., 2020). Furthermore, based on the normality test using the Shapiro-Wilk test, the pre-test significance values for the control and experimental classes were 0.988 and 0.427, respectively. Both values are greater than the 0.05 threshold, indicating that the pre-test data for both classes are approximately normally distributed. This normal distribution is important because it indicates that the pre-test results of the two groups of students do not deviate significantly from normality, thus meeting the basic assumptions for conducting further parametric statistical tests (Shih et al., 2023).

In addition to the pre-test, a normality analysis was conducted on the post-test data for both classes. The normality test results showed that the post-test significance value for the control class is 0.432, and for the experimental class is 0.217. These two values are also greater than 0.05, indicating that the post-test data for both classes are approximately normally distributed. The normal distribution of the post-test results indicates the consistency and validity of the data obtained after the intervention, in both the control and experimental classes (Hofer et al., 2018). With confirmed normal distributions in both pre-test and post-test data, comparative analysis of the increase in understanding between the two classes after the intervention becomes more accessible and valid (Penn & Ramnarain, 2019).

Meanwhile, the significance value obtained from Levene's test of equality of error variance is 0.706. Levene's test assesses the equality of variances (homogeneity) across groups; in this case, between the control and experimental classes. The significance value of 0.706 is much greater than the threshold of 0.05, which means that the error variance between the two groups is not significantly different. In other words, the assumption of homogeneity of variance is met, allowing the use of additional parametric statistical tests for data analysis.

Homogeneity of variance is essential because the statistical analysis results could only be valid with homogeneity. Meeting the assumption of homogeneity of variance is necessary for experimental research because it indicates that the control and experimental groups have similar variability (Abulela & Harwell, 2020). This ensures that comparisons between groups are not influenced by differences in error variance, making the analysis results more valid and reliable. Meanwhile, the increase in disaster preparedness among students in the experimental class was recorded at 0.7 (70%), which falls within the high category. This significant increase shows that using Android-based science e-modules with the SETS (science, environment, technology, and society) approach effectively improves students' disaster preparedness. The SETS approach integrates scientific concepts with environmental, technological, and social aspects, helping students better understand the material and its relevance, and apply it in real-world contexts related to disaster preparedness (Chan & Nagatomo, 2021). Furthermore, integrating technology into learning can increase student engagement and effectiveness (Bedenlier et al., 2020).

The significant increase in the experimental class indicates that the Android-based e-module can provide more interactive and exciting learning materials. This interactivity is essential to science learning because it allows students to participate and construct their knowledge actively (Petersen et al., 2022). Interactive learning can improve students' conceptual understanding by allowing them to process information more deeply. This aligns with research findings that show e-modules can significantly improve student learning outcomes. Meanwhile, the SETS approach in the e-module also provides additional benefits by linking science learning with fundamental societal issues, such as disaster preparedness. This makes learning more meaningful for students because they can see the direct relevance between what they learn in class and real life. In line with this statement, linking learning to real contexts can increase students' motivation and interest in learning (Raza et al., 2020).

On the other hand, the increase in students' disaster preparedness in the control class was only 50%, which falls within the medium category. Even though there is an improvement, these results show that the traditional learning approach using PowerPoint media, combined with a scientific learning approach and discovery models, is less practical than using Android-based e-modules. Learning that is overly structured and not interactive can hinder students' learning because it does not actively involve them in the learning process (Børte et al., 2023). This shows that conventional learning methods are less effective in facing modern learning challenges that require technological adaptation. Meanwhile, using Android-based e-modules allows students to study independently and flexibly at their own pace. Technology-based learning can provide a more personal and adaptive learning experience, increasing learning effectiveness (Arsovic & Stefanovic, 2020). This is important in disaster preparedness, where in-depth understanding and practical application of knowledge are essential. Overall, the results of this research show that the use of technology, especially Android-based e-modules with the SETS approach, can have a significant positive impact on increasing students' understanding and disaster preparedness.

Conclusion

The Android-based science e-module grounded in the SETS (Science, Environment, Technology, Society) approach proved highly effective in enhancing students' disaster preparedness. The experimental class demonstrated substantial improvement, substantially outperforming the control class, which employed conventional PowerPoint instruction alongside a scientific, discovery-based model. The latter yielded only a moderate gain, indicating the relative ineffectiveness of traditional methods for this educational objective. The SETS approach provides a multidimensional understanding by integrating scientific, environmental, technological, and social perspectives, thereby making learning more relevant and engaging. Consequently, the adoption of Android-based e-modules with the SETS approach is strongly recommended. The findings underscore that integrating interactive digital technology into instruction is a viable and necessary strategy for modern education, fostering greater student engagement and deeper conceptual understanding. Continued innovation and refinement of technology-enhanced learning tools are therefore essential for achieving superior educational outcomes.

Acknowledgments

We extend our sincere gratitude to all parties who contributed to the successful completion of this research. We extend our deepest gratitude to the participants who contributed to its success. We extend our sincere gratitude for the cooperation and support of Universitas Islam Negeri Sunan Kalijaga Yogyakarta and Universitas Musamus, Papua.

Author Contributions

Conceptualization, H.P. and T.Y.; methodology, H.P.; software, K.U.; validation, A.R., T.Y., and K.U.; formal analysis, H.P.; investigation, A.R.; resources, T.Y.; data curation, K.U.; writing—original draft preparation, T.Y.; writing—review and editing, H.P.; visualization, A.R.; supervision, H.P.; project administration, K.U.; funding acquisition, T.Y. All authors have read and agreed to the published version of the manuscript.

Funding

This research received no external funding.

Conflicts of Interest

The authors declare no conflict of interest.

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