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EFEKTIVITAS PENGGUNAAN BAHAN AJAR TEMATIK BERBASIS DIGITAL TERINTEGRASI STEM UNTUK SISWA TK SAVE THE KIDS

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ABSTRAK

Berdasarkan pengamatan yang dilakukan oleh peneliti dalam proses pembelajaran, guru di TK Save The Kids masih menggunakan buku pedoman tanpa memunculkan hal baru/ bahan ajar digital dengan pendekatan STEM. salah satu upaya yang dapat dilakukan adalah dengan menerapkan penggunaan bahan ajar digital yang dapat menunjang pengetahuan siswa, kedisiplinan, Tanggung Jawab dan Aktivitas pembelajaran. Penelitian ini bertujuan untuk melihat efektivitas penggunaan bahan ajar digital terintegrasi STEM yang dilakukan di TK Save The Kids dengan menerapkan efektivitas penggunaan bahan ajar berbasis digital dengan menilai tiga aspek yaitu kedisiplinan, Tanggung Jawab serta aktivitas dalam pembelajaran. Hasil penelitian dengan menggunakan metode kuantitatif menunjukkan bahwa efektivitas penggunaan bahan aja berbasis digital terintegrasi STEM dengan menilai 3 aspek yakni kedisplinan, tanggung jawab dan aktivitas dalam pembelajaran melalui angket pengamatan dengan rata-rata nilai perbandingan antara sebelum menerapkan bahan ajar digital mendapatkan nilai rata- rata 57 % dan sesudah menggunakan bahan ajar digital terintegrasi STEM mendapatkan nila rata-rata (91%) yang merupakan kriteria sangat baik sekali, terlihat jelas persentase peningkatan sebesar 28% perbandingan diantara keduanya, penggunaan bahan ajar ini menunjang keefektifan siswa dalam pembelajaran. Dengan demikian dapat disimpulkan bahwa efektivitas penggunaan bahan ajar tematik berbasis digital terintegrasi STEM menunjang proses pembelajaran kearah yang lebih positif di TK Save The Kids.

ABSTRACT

Based on observations made by researchers in the learning process, teachers in schools still use guidebooks without creating new things/digital teaching materials with a STEM approach. One effort that can be made is to implement the use of digital teaching materials that can support student knowledge, discipline, responsibilities and learning activities. This research aims to see the effectiveness of using STEM-integrated digital teaching materials carried out at the TK Save The Kids by implementing the effectiveness of using digital-based teaching materials by assessing three aspects, namely discipline, responsibility and activities in learning. The results of research using quantitative methods show that the effectiveness of using integrated digital STEM-based materials is by assessing 3 aspects, namely discipline, responsibility and activity in learning through observation questionnaires with average comparison scores between before applying digital teaching materials getting an average score of 57% and after using STEM integrated digital teaching materials getting an average score (91%) which is a very good criterion, it is clear that the percentage increase is 28% compared between the two, the use of these teaching materials supports

student effectiveness in learning. Thus, it can be concluded that the effectiveness of using integrated digital STEM-based thematic teaching materials supports the learning process in a more positive direction at TK Save The Kids

INTRODUCTION

Undang-Undang No. 20 Tahun 2003 concerning the National Education System states that the curriculum is a set of plans and regulations concerning the objectives, content, and learning materials used as guidelines for organizing learning activities to achieve specific educational goals. The curriculum implemented in elementary schools (SD/MI) is the 2013 curriculum, a refinement of the 2006 KTSP curriculum. The 2013 curriculum aims to prepare Indonesians to develop the skills to live as individuals and citizens who are faithful, productive, creative, innovative, and effective, and able to contribute to community life, the nation, the state, and world civilization. The 2013 curriculum aims to develop cognitive, affective, and psychomotor skills, which can be applied in learning environments at school, at home, and in the community. Teachers, as facilitators and mediators in the classroom, must understand the learning objectives in elementary school. Furthermore, teachers must consider what learning strategies will achieve these objectives. Learning in schools is integrated with four language skills: listening, speaking, reading, and writing (Jalaluddin et al., 2020).

In thematic learning in kindergartens, teachers are required to be more active, creative, and innovative. This is mandated by Government Regulation No. 19 of 2015 concerning National Education Standards, as amended by Government Regulation No. 32 of 2013 concerning Amendments to Regulations, which mandates that: The learning process in educational units is conducted interactively, inspiringly, fun, and challenging, motivating students to actively participate, and providing sufficient space for initiative, creativity, and independence in accordance with students' talents, interests, and development (Mardhatillah et al., 2019). Therefore, each educational unit plans its learning implementation to improve the effectiveness or achievement of student graduates. The role of education can determine the success of student development.

One learning tool is teaching materials. Teaching materials are defined as materials that facilitate student understanding, created through applications for reading through digital devices/websites. Teachers ideally have the ability to develop teaching materials

and learning media that can be accessed through digital devices, as well as the ability to utilize other learning resources. (Harimurti, E. R. 2019).

Teaching materials serve as information, tools, and texts needed by teachers for planning and reviewing learning implementation. As stated above, teaching materials must have a clear direction and purpose, particularly regarding the concepts taught, the approaches used, the methods employed, and the teaching techniques to be implemented. (Yetra, T. 2019)

Based on these issues, one effort that can be taken to support learning is to examine the effectiveness of digital teaching materials that have been developed and can support students' cognitive abilities, designed to foster higher-order thinking in solving authentic problems in everyday life. STEM (Science, Technology, Engineering and Mathematics) is one of the learning and strategies that is seen as an approach that makes significant changes in the 21st century. 21st century skills prioritize the application of STEM in learning activities consisting of 4Cs, namely Creativity, Critical Thinking, Communication, Collaboration where the learning process will prioritize a skill that has the aim of adapting to the conditions of the times where mathematics, verbal and knowledge will prioritize a solution when carrying out cooperation/collaboration independently in a positive communication, so that students can find innovative solutions to problems faced in real terms and can convey them well (Syahirah et al., 2020)

Research conducted by Ratna on the Effectiveness of Using Textbooks to Improve Learning Outcomes on Aqidah and Akhlak at Mts Aisyiyah Makassar Branch found that textbooks are effective in learning. Furthermore, research conducted by Yunita Sari demonstrated the effectiveness of science comics on the learning outcomes of fifth-grade elementary school students. Marsudi's research also demonstrated that using textbooks increased students' average grades in teaching and learning activities and enhanced their critical thinking skills. Based on the three previous studies, it can be concluded that both teaching materials and textbooks are effective in learning.

Each learning method has its own advantages and disadvantages, as stated by Sujana (2005:253). The advantages of digital teaching materials include flexible learning time, easy access, broader perspectives, a shift from passive to active student roles, relatively more efficient learning, and structured and scheduled learning instructions via the internet. Meanwhile, the disadvantages are limited internet access, lack of interaction between teachers and students, different understanding of the material, depending on the user's ability, and the changing role of teachers from those who originally mastered

conventional learning techniques, now also required to know learning techniques that use ICT.

The difference between this study and previous research is that the researchers sought to determine the effectiveness of using digital-based thematic teaching materials integrated with STEM. The use of the STEM approach is intended to enable teachers to implement STEM in thematic learning at the elementary school level. Thematic learning is taught based on THEMES, which consist of several learning contents. Therefore, these teaching materials are highly suitable for teachers to use as reference sources, and teachers can develop and deliver more innovative and enjoyable STEM-based learning activities (Mulyani, 2019).

STEM education has several advantages compared to other forms of education. The integrated education of the four structures can provide appropriate solutions to address various real-world problems, oriented towards developing students' creativity and innovation. Similar research conducted by various experts, Honey, highlights the existence of science, technology, engineering, and mathematics (STEM) education, which offers multidisciplinary subjects with innovative teaching materials. Caliskan et al. stated that this material not only attracts students' interest but also provides learning with deeper understanding, critical thinking, use of tools, curriculum integration, and problem solving indirectly related to students' conceptual knowledge and alternative concepts (Rulyansah & Hasanah, 2018).

Based on the description above, the researcher is interested in conducting research on "The Effectiveness of Using Digital-Based Thematic Teaching Materials Integrated with STEM for Save the Kids Kindergarten Students."

RESEARCH METHOD

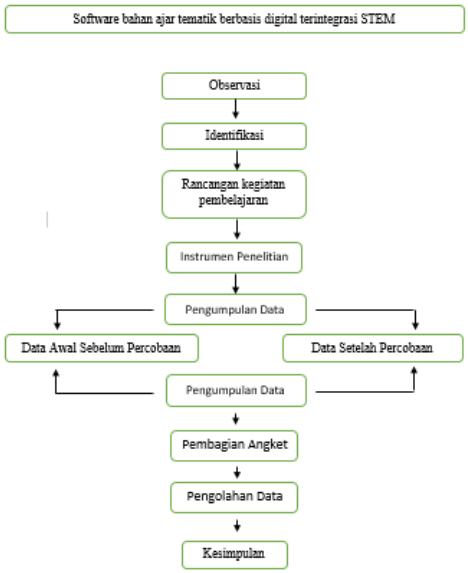
The type of research used is quantitative. Initial data will be collected from students before using digital teaching materials (pre-test) and after using digital-based teaching materials integrated with STEM (post-test).

According to Sugiyono, quantitative research can be defined as a research method based on the philosophy of positivism, used to study a specific population or sample, collect data using research instruments, and conduct quantitative/statistical analysis, with the aim of testing a predetermined hypothesis.

This study used one class. In the initial stage, the researcher collected data without using digital-based thematic teaching materials integrated with STEM. In the subsequent stage, the researcher implemented the digital-based thematic teaching materials

integrated with STEM with the students. The assessments here included student discipline, responsibility, and activity during the learning process. This comparison can determine the effectiveness of the digital-based thematic teaching materials integrated with STEM developed by the researcher.

According to Fajriyyah, E., & Fajrie, N. (2022), the experimental class received observation, while the control class was called the comparison class without observation. For more details on the research method, see the flowchart diagram below.



Gambar 3.1 flowchart Penelitian

This research was designed using a true-experimental design.

R	O1	X	O2

R: Random to subject, meaning class/student subject
X: Integrated digital-based thematic learning media model using STEM
O1: Initial data obtained from a fourth-grade class without learning materials
O2: Result data obtained from a fourth-grade class using learning materials

This research design used fourth grade as the subject. This study used thematic digital-based teaching materials integrated with STEM. For the initial data, this class was not given a learning model using STEM-based teaching materials, but instead used thematic grade IV textbooks. The independent variable (x) is usually called the independent variable, namely the variable that influences other variables. The independent variable in this study was the learning media, which was digital-based teaching materials integrated with STEM. The dependent variable (Y) is the variable that depends on or is influenced by other variables. The dependent variable in this study was

the effectiveness of the use of teaching materials. The data were collected using an observation questionnaire.

The research was conducted at Save The Kids Kindergarten in the 2024/2025 academic year. Samples commonly used in quantitative research are samples taken from a truly representative population, so that the conclusions learned from the sample can be applied to the population. The sample in this study was students at Save The Kids Kindergarten, a class consisting of 20 students.

Data Collection Techniques by observing the activities being carried out, then the researcher observes the activities of students during the learning process. Observation is a data collection technique, where the researcher makes direct observations of the research object to see closely the activities carried out. This data will be collected using a questionnaire conducted by the researcher by applying 3 aspects: discipline, responsibility and activity using Integrated Digital-Based Thematic Teaching Materials STEM.

Table 1. Discipline observation questionnaire

No	Discipline Indicator	5	4	3	2	1
1	Students arrive on time during the learning process using digital-based thematic teaching materials integrated with STEM.					
2	Students complete assignments given by teachers through learning using digital-based thematic teaching materials integrated with STEM.					
3	Do students comply with learning regulations by using digital-based thematic teaching materials integrated with STEM?					
	Jumlah					

Information:

5 Highly Diciplined = 90 - 100
4 Very Diciplined = 80 - 90
3 Quite Disciplined = 70 - 80
2 undisciplined = 60 – 70
1 Very undisciplined = 50 – 60

Table 2. Responsibility Observation Questionnaire

No	Responsibility Indicators	5	4	3	2	1
1	Students are responsible for paying attention to learning using digital-based thematic teaching materials integrated with STEM					
2	Students provide feedback to teachers in the form of questions and answers on learning using digital teaching materials.					
3	Students participate in demonstrating teacher-directed learning in the learning process using digital-based, STEM-integrated teamtic teaching materials.					
	Jumlah					

Information:

5 Highly Responsibility	= 90 - 100
4 Very Responsibility	= 90 - 80
3 Quite Responsibility	= 80 - 70
2 Unresponsibility	= 70 - 60
1 Very Unresponsibility	= 60 – 5

Table 3. Activity Observation Questionnaire

No	Activity Indicators	5	4	3	2	1
1	Are students active in paying attention to the teacher's explanation of learning using digital-based thematic teaching materials integrated with STEM?					
2	Are students active in reading learning using digital-based thematic teaching materials integrated with STEM?					
3	Are students active in expressing their opinions in learning using digital-based thematic teaching materials integrated with STEM?					
	Jumlah					

Information :

5 Highly Active	= 90 - 100
4 Very Active	= 80 - 90
3 Quie Active	= 70 - 80
2 Unactive	= 60 - 70
1 Very Unactive	= 50 - 60

Data Analysis Techniques in this study used Save The Kids Kindergarten students, namely initial data as the control class and final data as the experimental class, the data analysis technique used Microsoft Excel

RESULTS AND DISCUSSION

In the initial stages of this research, a post-test observation questionnaire was implemented, conducted without the use of digital-based, STEM-integrated thematic teaching materials. The results are shown in the following table:

No	Name	Rated Aspect			Score
		Dicipline	Responsibility	Activity	
1	Abdul Hafis	58	57	56	57 %
2	Arafatul Unaya	55	65	75	65 %
3	Aqiya Naila	63	69	78	70 %
4	Faqih Al Kausar	53	59	56	56 %
5	Karina	69	65	67	67 %
6	M Faiza	56	51	52	53 %
7	M Asraf M	69	60	60	63 %
8	M Ataya Bilal	58	55	67	60 %
9	M Fahri Saputra	57	55	53	55 %
10	M Faqih Azka	58	64	73	65 %
11	M Jefri	57	53	72	60 %
12	Marzuki Akhdar	56	53	68	59 %
13	Naufal Rifki	57	68	51	58 %
14	Nailah Farafisa J	79	76	75	76 %

No	Name	Rated Aspect			Score
		Dicipline	Responsibility	Activity	
15	Rahil Natasya	74	68	76	72 %
16	Raihan Maulana	53	51	55	53 %
17	Rauzatul Hilma	66	73	78	72 %
18	Silka Amelia	66	76	55	65 %
19	Syawalena Fitri	75	69	65	69 %
20	Zabran Al Afkar	59	62	76	65 %

In the previous chapter, the author stated that the data collection techniques used in compiling this thesis were observation and questionnaires. The questionnaire, compiled based on the research topic, consisted of nine questions: three on discipline, three on responsibility, and three on activities. In this research phase, the questionnaires were not distributed to students; instead, they were observed by the researcher at the beginning of the learning process using digital-based thematic teaching materials integrated with STEM to assess their effectiveness.

This study aimed to answer the research question: how effective is the use of digital-based thematic teaching materials integrated with STEM for Save the Kids Kindergarten students? The results of the teaching process using these teaching materials were effectively used by teachers to assess the effectiveness of learning by examining the results of the three observation questionnaires, which were studied using three aspects: discipline, responsibility, and learning activities. The questionnaire contained nine questions observed during learning using digital-based thematic teaching materials integrated with STEM for kindergarten students.

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questions observed during learning using digital-based thematic teaching materials integrated with STEM for kindergarten students.

CONCLUSIONS AND SUGGESTIONS

Based on the research results and discussion, it can be concluded that the effectiveness of using digital-based thematic teaching materials integrated with STEM for Save the Kids Kindergarten students has an impact on students and can improve student discipline, responsibility, and activity in learning through the implementation of these teaching materials. These results were obtained based on observation questionnaire scores containing three assessment aspects: discipline, responsibility, and activity. Students' scores before using the digital-based thematic teaching materials integrated with STEM were 57. Students' scores after using the digital-based thematic teaching materials integrated with STEM were 91 on average, representing a 28% increase. This demonstrates that the implementation of discipline, responsibility, and activity through the use of digital-based thematic teaching materials integrated with STEM significantly impacts students.

Based on the results of this study, the researcher would like to offer the following recommendations to relevant parties:

1. The schools involved in the study should further diversify their learning models to improve learning effectiveness.
2. For students, to always strive to improve discipline, responsibility and learning activities so as to support and achieve good results in the future.
3. For further research, it is recommended to add models or teaching materials in the form of sophisticated technology and a broader scope such as two-way learning methods and be able to provide constructive suggestions on research topics to obtain more detailed and comprehensive results.

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