



EFFECTIVENESS OF ENVIRONMENT-BASED DIFFERENTIATED LEARNING DESIGN TO IMPROVE LEARNING OUTCOMES OF ELEMENTARY SCHOOL STUDENTS

Ronny Sitanggang¹

State University of Medan

Email: ronnysitanggang70@gmail.com

Dede Ruslan²

Lecturer at State University of Medan

Anita Yus³

Lecturer at State University of Medan

Abstract

The purpose of this study is to determine the effectiveness of developing environmentally-based differentiated learning designs to optimize the needs and learning outcomes of elementary school students in Palipi District, Samosir Regency. This research was conducted at the Palipi Subdistrict Elementary School, Samosir Regency. This research method is a development research from Thiagarajan. The subject of the study was a teacher in an elementary school in Palipi Subdistrict, Samosir District. The data analysis techniques in this study are descriptive studies and t-tests. The results of the research and conclusions in this study are that the learning tools developed have met the criteria for effectiveness, namely (1) the completion of classical student learning in small-scale trials has reached the good category and in large-scale trials has reached the excellent category; (2) the achievement of student learning objectives during learning activities that meet the ideal criteria set; (3) positive student responses to the components of learning tools and learning activities developed; and (4) the allocation of ideal use of time.

Keywords: *Learning Effectiveness, Environment-based Learning Outcomes, Learning Outcomes*

A. Introduction

In today's millennial era, teachers face much greater challenges than the previous era, because today's education is different from Japanese-era education, today's teachers are millennial teachers not colonial teachers, technology has changed

everything, including people's needs for education, that's what happened in the era of the industrial revolution now (Yusrizal & Fatmawati, 2021) . Teachers face very diverse learners, very complex and difficult learning materials, standards of the learning process and also the demands for achieving higher thinking abilities of students. Teachers are required not only to be able to teach and manage classroom activities effectively, but also to be required to be able to build effective relationships with students and the school community using technology to improve quality, as well as reflecting and improving learning practices continuously (Fatmawati et al., 2021; Yusrizal et al., 2019).

But of course there are other things that must also get special attention to the learning implementation process to get maximum results. We cannot deny that the learning process has a unique difference between students from one to another. There are students who are quick in capturing lessons and can complete learning activities faster than expected and there are also students who are slow in learning so that they often miss lessons and require a longer time than expected for normal students (Kamal, 2021).

According to Astiti., et al., (2021) the current learning material in the field only emphasizes the presentation of knowledge separately and moreover prioritizes theories that make students often feel bored and this makes it difficult for students to get a concept or meaningful learning experience as expected in the concept of integrated learning. Not to mention plus the problem that there are still many students who do not understand the material presented because the breadth and depth of teaching materials are not in accordance with the level of student development is a challenge in itself.

The same problem also occurs in the elementary school palipi sub-district of Samosir regency where the ongoing learning conditions are still teacher-centered without giving students the opportunity and freedom to explore their potential and abilities. Lessons are also still classical, one material for all students, the same media is used for all students so that the student learning process has not been accommodated properly as an effort to get good learning outcomes. In addition, because the learning approach that applies and is used today is still a classical approach, there are still some students who have not been able to capture and accept the learning material provided properly. Meanwhile, the delivery of the material has been carried out in such a simple way with the aim that each student can receive the learning material provided properly. This will certainly have an impact on the learning outcomes of the students themselves, so that in the end the expected ability development is not achieved.

This is certainly a challenge for teachers to apply and choose what learning methods to use so that the learning process can run optimally and provide the expected learning outcomes. With all the diversity of students in the classroom, it is impossible to form or produce the expected graduate competencies if the learning process is carried out with only one technique, method, media, and approach. Being likened to just one size will not be suitable or effective for all learners.

According to Suwartingsih (2021) there are still many talented students whose achievements in school do not reflect their outstanding intellectual potential. One of the causes is external conditions or learning environments that are less supportive, less challenging for them to realize their abilities optimally.

For this reason, it is necessary to develop alternative educational strategies to produce superior students through the provision of attention, treatment and educational services based on their talents, interests and abilities. This is so that the education that has been given to students reaches optimal goals, then learning must be aligned with the potential of students (Suwartingsih, 2021)

One of the media that can be used in a differentiated learning model to help a teacher deliver material is environment-based, with the aim of developing learning process skills and student learning outcomes because it can create a learning atmosphere that is more interesting, more fun, more interactive, not boring, and effective and efficient (Fatmawati & Yusrizal, 2021a, 2021b).

The environment is one of the most important learning resources and has very valuable values in the framework of the learning process of participants. The use of the environment allows for a more meaningful learning process because the child is faced with the actual conditions. By utilizing the environment as a learning medium, it is hoped that students will be able to develop and preserve natural resources and improve the quality of human resources (Setiawan, 2011).

The importance of this differentiated learning design can also be seen from some of the results of research that has been carried out previously. Such as research conducted by Joseph., et al., (2013) where in his research showed that the learning process carried out and designed with differentiated learning has a positive impact and effect on student learning outcomes. This is because there is an opportunity given to students to find ways and learning styles that are felt suitable to develop the abilities and potential that exist in them.

B. Method

This research is a development research, model development used is the 4D model development approach (Four-D model) developed by Thiagarajan. This research was conducted at the Palipi Subdistrict Elementary School, Samosir Regency. The subjects of the study were teachers in elementary schools in Palipi District, Samosir Regency. In this study, the data collection techniques used were observation, questionnaire and documentation. The data obtained is in the form of a check list which is summarized in the form of a scored likert scale table. The data obtained were analyzed descriptively qualitatively by calculating the percentage of each category in differentiated learning.

To determine the criteria for the effectiveness of student responses to the development of differentiated learning designs, the data obtained are summarized in the form of a Likert scale table with the following scores:

Table 1. Validation Instrument Item Answer Criteria

No.	Answer	Score
1	Very good/Very appropriate/Very Interesting	4
2	Good/Appropriate/Interesting	3
3	Not good/Less appropriate/Less attractive	2
4	Not good/Not appropriate/Unattractive	1

(Sudjana: 2007)

C. Finding and Discussion

1. Finding

a. Small Group Trials

The results of the assessment and responses to the environmental-based learning design in the individual trials carried out, showed that the product developed was feasible to use and there was a suggestion for improving the appearance to make it more attractive to students in individual trials of environmental-based learning design development products, so that development activities continued in small group trials with revisions.

Based on the criteria for the completion of individual learning outcomes which are arranged based on student abilities, the percentage is classified in the completion criteria.

Table 1. Results of Individual Learning Completion of Small Scale Test

No.	Student	Value (x)	Kb	Ket
1	A1	15	75%	T
2	A2	17	85%	T

No.	Student	Value (x)	Kb	Ket
3	A3	8	40%	Bt
4	A4	13	65%	Bt
5	A5	16	80%	T
6	A6	14	70%	T
	Sum	83		
	Average	14		
	Standard Deviation	3.83		
	Variance	14.7		

Based on the data on the results of individual learning completion obtained based on student abilities, it can be seen that out of 6 children there are 2 students who are "Incomplete" and there are 4 students who have been "Completed".

The completion of students' classical learning can be calculated by the following formula:

$$PKK = 100\% \frac{\text{Banyak siswa yang Tuntas}}{\text{Banyak subjek penelitian}} \times$$

$$PKK = 100\% \frac{4}{6} \times$$

$$PKK = 67\%$$

Based on the data above, there are 67% of students who have achieved birth control $\geq 70\%$. After the students' completion of the learning process individually and classically is analyzed, the results of the pre-test and post-test are calculated with a gain score.

Table 2 Pre Test results and Post Test Small Scale Test Students

Pre test			Post test			Ket
Value (X)	Frequency (F)	X*F	Value (X)	Frequency (F)	X*F	
4	1	4	9	1	9	T
6	1	6	10	1	10	T
8	1	8	12	1	12	Bt
9	1	9	14	1	14	Bt
13	1	13	15	1	15	T
15	1	15	16	1	16	T
Sum		55	Sum		76	
Average		9.2	Average		13	
Standard Deviation		4.2	Standard Deviation		2.8	

b. Data Analysis of the Effectiveness of Environmental-Based Learning Design

Based on individual learning completion data according to the results of student abilities, it is known that there are 3 students who are "not complete" and there are 27 students who are "complete". The completion of students' classical learning can be calculated by the following formula:

$$PKK = 100\% \text{ PKK} = x 100\%$$

$$PKK = 90\% \frac{\text{Banyak siswa yang Tuntas}}{\text{Banyak subjek penelitian}} \times \frac{27}{30}$$

Based on the classical learning completion data above, there are 90% of students who have achieved birth control $\geq 70\%$. After the completion of students in learning individually and classically in the analysis, the results of the pre-test and post-test are calculated with a gain score. To see an improvement in the value and effectiveness of the learning design developed between before and after using the numbered gain score formula:

Table 3 Results of Pre Test And Post Test Large Scale Test

Pre test			Pos test			Ket
Value (X)	Frequency (F)	X*F	Value (X)	Frequency (F)	X*F	
4	5	20	11	1	11	Bt
5	4	20	12	1	12	Bt
6	4	24	13	1	13	Bt
8	3	24	14	1	14	T
9	3	27	15	3	45	T
10	1	10	16	4	64	T
12	3	36	17	3	51	T
13	6	78	18	12	216	T
15	1	15	19	4	76	T
Sum		254	Sum		502	
Average		8.5	Average		17	
Standard Deviation		3.8	Standard Deviation		2.7	

For more details about the results of the pre-test and post-test of the large scale test can be seen in the following figure:

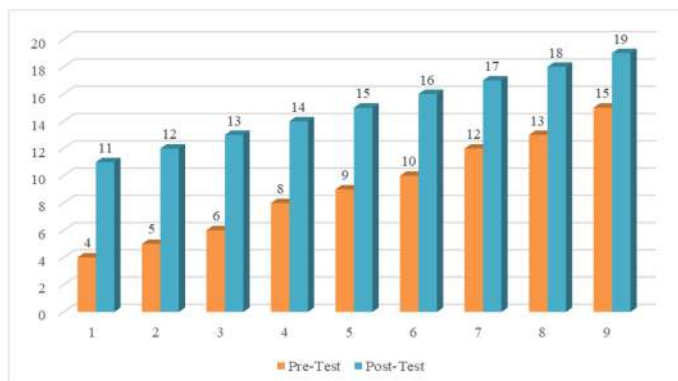


Figure 1 Large-Scale Test Student Pre-Test and Post-Test Diagram

2. Discussion

The effectiveness of environmentally-based differentiated learning design is seen

through how improved student learning outcomes in the form of pre-tests and post-tests of individual learning completion, classical learning completion by looking at the improvement of gain score results, and student response questionnaire sheets to learning designs used in the learning that have been carried out.

The effectiveness of environmental-based learning design on the material of rights and obligations by using the results of pre-tests and post-tests at the beginning of learning and the end of learning activities that have been carried out. Based on the results of the pre-test which amounted to 20 multiple choice questions consisting of four choices, namely a, b, c, and d. student pre-test data seen in table 4.11 it can be seen that student learning outcomes are still low with an average of 13 with a standard deviation of 2.8 this is seen based on the minimum completion criteria of the minimum completion of schools for PPKN subjects is 70. Mardhatillah (2018) in his research The learning media developed has been said to be effectively used in learning. This is in accordance with some of the results of questionnaire analysis from material experts, media experts and students who assess products.

At the end of the learning activity and have used an environment-based learning design, a Post test is carried out to see student learning outcomes. Based on the results of the post test carried out, it can be seen that the results of the student's post test reached an average of 17 with a standard deviation of 2.7 Based on the reference to the minimum completion of the school for PPKn subjects is 70, it can be seen that the learning outcomes have increased and it can be said that student learning outcomes have reached the minimum completion criteria score (KKM).

Based on the results of students' classical completion in table 4.11, it can be seen that the average classical learning completion data of students reaches 17 who have reached $KB \geq 70\%$. After the completion of students in learning individually and classically in the analysis, the results of the pre-test and post-test are calculated with a gain score to assess the increase in the effectiveness of environmental-based learning designs between before using and after using in the results of 0.81, the student gain score is relatively high. Based on the above results that there is an increase from before and after use, in line with that in the journal. Radityan, et al (2014) said that good learning design will greatly affect student learning outcomes.

In addition to learning outcomes, the effectiveness of media can also be seen by questionnaires of student responses using environmental-based learning designs that strongly agree with 73.3% and students who agree with interactive media developed by

researchers. Based on the student's response, it was concluded that the learning media developed was said to be effective. Based on the journal Naniek K (2015) it can be seen that children's enthusiasm can be seen from a student response questionnaire data.

Based on the description of learning outcomes and student responses above, it can be concluded that the environment-based learning design developed can be said to be effective. Because it meets the criteria for the quality of completion of environmental-based learning designs, namely effectiveness and feasibility, environmental-based learning designs are said to be of high quality. In addition, from the research that has been carried out by researchers and based on research that has been carried out by previous researchers, it can be said that there needs to be a change in learning design, one of which is by developing models or methods based on the environment in the form of environmental-based learning designs combined with various learning models/strategies that can support the learning process so as to make students more active in the process learning (Fatmawati & Yusrizal, 2021a).

Based on the purpose of development research, namely to determine the feasibility and effectiveness of environmental-based learning design, then this can be said to be effective and feasible for use for all students. Because based on the data obtained, it shows that this environment-based learning design is effective in improving student learning outcomes.

D. Conclusion

From the results of the research that has been carried out, it can be concluded that the learning skills developed have met the effective requirements, namely (1) the classical completion of student learning in small-scale trials has reached the good category and in large-scale trials has reached the very good category; (2) the achievement of student learning objectives during learning activities that meet the ideal criteria set; (3) positive student responses to the components of learning tools and learning activities developed; and (4) the allocation of ideal use of time.

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