Development of Environmental-Based Differentiated Learning Designs to Improve Student Learning Outcomes at Elementary Schools Kecamatan Palipi Kabupaten Samosir

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Abstract. This study aims to describe the level of feasibility and effectiveness of the development of Environmentally Based Differentiated Learning Designs to Improve Student Learning Outcomes. This research was conducted at the Elementary School in Palipi District, Samosir Regency. The subjects of this study were all fourth grade students of the Palipi District Elementary School, Samosir Regency for the 2021/2022 academic year, totaling 30 students. This research method is Thiagarajan 4-D development research. The results showed (1) Based on the results of the validity of linguists 86.53%, and instructional design experts 83.33%. ; (2) Environmentally-Based Differentiated Learning Designs are categorized as practical ; (3) the Environmentally-Based Differentiated Learning Design is said to be effectively used in learning with the assumption that the value of student learning is higher when using the development of Environmentally-Based. differentiation based on a practical environment and suitable for use in the learning process.

Keywords: learning design, environment, learning outcomes.

1. Introduction

Education is an ethical endeavor of humans, for humans and for human society. Education aims to develop one's potential and abilities to an optimal level within the limits of individual nature, with the aim of increasing human and community development and continuously increasing higher dignity. Education is an element that cannot be separated from human beings. Starting from the womb to growing up and then old humans experience the educational process. Education is a light that guides humans in determining the direction, purpose, and meaning of this life.

Educational institutions are the agency's strategy in order to improve the quality of human resources. Through this educational institution, efforts to prepare the younger generation to face and face developments in the global era began. Therefore, education must be carried out as well as possible by taking into account all aspects of the development to be achieved through the education so that the educational process carried out is of high quality and can improve the quality of human resources.

The implementation of education that can be carried out in Indonesia from time to time uses the classical mass approach, namely quantity on quantity to be able to serve as many students as possible. The apparent weakness of this kind of education is that it does not accommodate the individual needs of students outside the normal student group, while the true nature of education is to enable students to develop their intelligence potential and talents more optimally [1]. In addition, the affective and psychomotor components will also not develop in a positive direction if the learning systems and methods do not run in accordance with the national curriculum and education system [2].

Several learning theories that have existed so far have actually had a positive impact on the implementation of the learning process. Like the Humanistic learning theory, where in practice this theory describes that the learning process must originate and lead to humans themselves. According to this theory, the purpose of learning is to humanize humans. The learning process is considered successful if the learning has understood the environment and itself [3], [4].

In today's millennial era, teachers face much bigger challenges than the previous era, because today's education is different from Japanese 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. Teachers face very diverse students, very complex and difficult learning materials, standard learning processes and also demands for the achievement of students' higher thinking abilities. Teachers are required not only to be able to teach and manage classroom activities effectively, but also to be able to build effective relationships with students and the school community using technology to improve quality, as well as reflect and improve learning practices continuously.

But of course there are other things that must also get special attention in the process of implementing learning to get maximum results. We cannot deny that the learning process has a uniqueness that differs from one student to another. There are students who are fast in catching lessons and can complete learning activities faster than expected and there are also students who are slow in learning so they often fall behind in lessons and take longer than expected for normal students [5], [6].

The current learning material in the field only emphasizes the presentation of knowledge separately and moreover prioritizes theory which makes students often feel bored and this makes it difficult for students to get a concept or experience. meaningful learning as expected in the concept of integrated learning [7]. Not to mention the added 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 which is a challenge in itself.

There are still many talented students whose achievements in school do not reflect their outstanding intellectual potential. One of the causes is the external conditions or learning environment 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. It is intended that the education that has been given to students achieves optimal targets, so learning must be aligned with the potential

of students. Differentiated Instruction is learning that is tailored to the needs of students with the aim of maximizing the potential of each student. Educators try to accommodate the needs of each student to be grouped in order to get appropriate learning. This suitability includes: learning readiness, interests and student profiles [8].

Learning design is a systematic development effort based on certain learning and learning theories to ensure the quality of education, so that the term learning design model can be understood as a systematic concretization of learning development theory by using certain learning theories to ensure the quality of learning that contains principles, constructs, objectives. and steps. From the various explanations above, it can be found that learning design is a development of learning design both in terms of material, delivery and media used which were developed specifically by teachers as educators with the main aim that the learning delivered can be accepted and mastered well by students [9].

Differentiated Instruction is learning that is tailored to the needs of students with the aim of maximizing the potential of each student. Educators try to accommodate the needs of each student to be grouped in order to get appropriate learning. This suitability includes: learning readiness, interests and student profiles [8]. Suggests that differentiation learning means mixing all differences to get information, create ideas and express what they learn. In other words, differentiation learning is creating a diverse class by providing opportunities to capture content, process an idea and improve the results of each student, so that students will be able to learn more effectively. So it can be argued that differentiation learning is learning that focuses more on the different potentials and abilities possessed by each student so that the learning process will be designed and designed in such a way that all students can receive the learning provided properly.

2. Method

This research is a development research (Development Research). In the development method there are several types of models. The development model used is the 4D model development approach (Four-D model) developed by Thiagarajan. Location This research was conducted at the Elementary School in Palipi District, Samosir Regency. The research subjects were teachers and 30 students at the elementary school in Palipi District, Samosir Regency. Analysis of the data used using the N-gain score to see the comparison of learning outcomes.

3. Finding and Discussion

3.1 Finding

Product Feasibility Test

   a. Learning Language Expert

The results of the assessment by a linguist which includes the attractiveness of the physical appearance, the accuracy of the use of the design, the suitability of the format, the presentation with the target characteristics, the clarity of the media instructions, the clarity of the material

exposure, and the suitability of the evaluation with the material as a whole, it can be concluded that the level of achievement of the score is 86.53 where the range is at the level of achievement of a score of 85–100 categorized as "Very Good". The results of the assessment of linguists on the development of environmental-based learning designs received several comments, including: (a) Simplify sentence structures, (b) make sentences effective, (c) pay attention to spelling and word writing, (d) organize sentences. The conclusion from the assessments, comments and suggestions by linguists that the design of environment-based learning is worth trialling in the field with revisions.

b. Instructional Design Expert

The results of the assessment by instructional design experts on learning design which include aspects of media display design, media programming design, and media content design as a whole it can be concluded that the level of achievement of the score of the design expert is 83.33 where the range is at the level of achievement of a score of 70-84 categorized "Good". The results of the instructional design expert's assessment of learning design in the development of environmental-based learning designs received several comments, including: (a) improve the lesson plan format. (b) use methods/models that are appropriate to the student's environment. and the suggestion is that all data from the results of the design expert's review are used as a basis for revising in order to improve the learning design content before being tested on students as users of development products. Conclusions from the assessments, comments and suggestions by learning design experts that environmental-based learning designs are worthy of being tested in the field with revisions

Product Effectiveness Test

a. Small Group Trial

Analysis of small group trial data that includes aspects of design and language in environmental-based learning design as a whole reached 85.42% included in the "Very Good" category. The responses from several students said that "the media that is seen is very interesting and suitable for learning. , the display is in accordance with the students who use it, the selection of colors and layouts for environmental-based learning designs, by providing real images, it would be nice if all subjects used this design as a reference in learning.

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. development continued in small group trials with revisions.

Data on individual learning completion results obtained based on students' abilities, it can be seen that from 6 children there are 2 students who are "Unfinished" and there are 4 students who are "Completed". the following is a diagram of the results of the learning design development experiment.
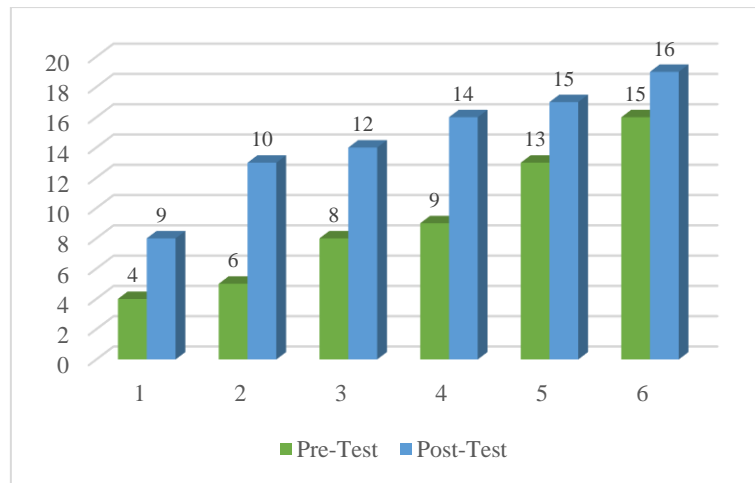
Fig. 1. Diagram of experimental results of learning design development

    b. Large Group Test

Based on the classical learning completeness data above, there are 90% in the very effective category with student achievement reaching KB 70%. After the students' mastery in individual and classical learning is analyzed, the results of the pre test and post test are calculated using a gain score. To see an increase in the value and effectiveness of the learning design developed between before and after using the normalized gain score formula.

Table 1. Large group study completion table

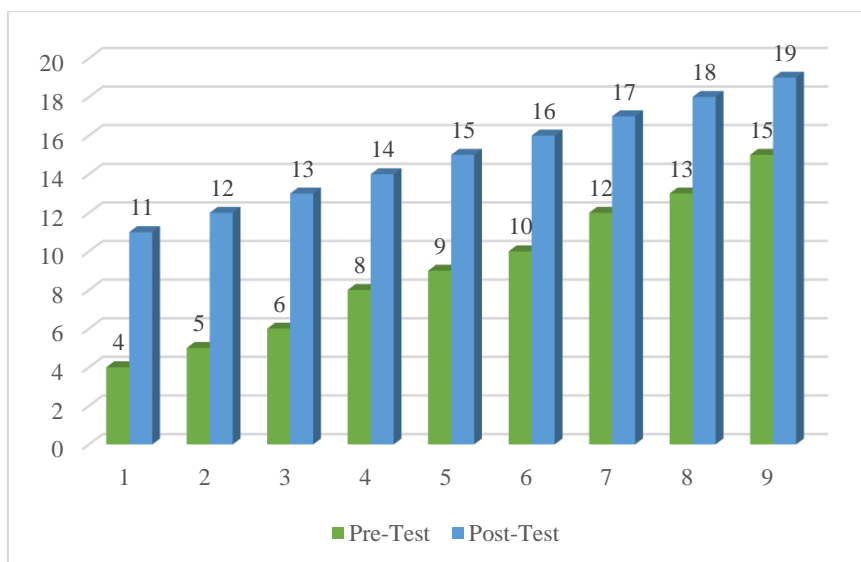| Pre test			Pos test			Description
X	F	X*F	X	F	X*F	
4	5	20	11	1	11	BT
5	4	20	12	1	12	BT
6	4	24	13	1	13	BT
8	3	24	14	1	14	T
9	3	27	15	3	45	T
10	1	10	16	4	64	T
12	3	36	17	3	51	T
13	6	78	18	12	216	T
15	1	15	19	4	76	T
Sum		**254**	**Sum**		**502**	
Average		**8,5**	**Average**		**17**	
Standar Deviasi		**3,8**	**Standar Deviasi**		**2,7**	

Fig. 2. Large group study completion diagram

3.2 Discussion

The validity criteria were obtained through the assessment of experts and practitioners on the environmental-based learning design developed. The acquisition of a valid learning design is caused by several factors, including: (1) the environmental-based learning design developed has met content validity. This means that in the development of environmental-based learning designs, it is in accordance with the demands of the existing curriculum. The demands of this curriculum are related to Core Competencies (KI) and Basic Competencies (KD) that must be achieved by students in learning activities that are adapted to the material or content of the lessons provided and adapted to environmental-based learning design steps. This is in line with Gronlund's opinion [10] that content validity is the accuracy of a measuring instrument in terms of the contents of the measuring instrument. A measuring instrument is said to have content validity if the content or material or material of the measuring instrument is truly a representative material for the learning materials provided. That is, the content of the measuring instrument is estimated according to what has been taught based on the curriculum.

Second, the environmental-based learning design developed has met the construct validity. That is, in the development of environmental-based learning design, it is in accordance with existing concepts and indicators and then combined with the surrounding environment. The learning designs developed were arranged to complement each other between lesson plans, student books, and worksheets that were adapted to the student's environment in order to improve student learning outcomes regarding rights and obligations. The fulfillment of a good validity aspect as stated above is in line with which states that the validity aspect refers to the extent to which the design of the developed device is based on content validity and construct validity.

Based on the results of the research and opinions above, that the results of the development of the learning design carried out have met the valid criteria. This learning design is declared valid because the final result on material validation is 86.53

And the validation of the instructional design is 83.33 so that the development of the learning design is declared valid. Validity is illustrated from the results of the validator's assessment that each validator states both based on content (according to the curriculum), construct (according to the characteristics/principles of learning) and language (in accordance with the applicable language rules, namely enhanced spelling). Language validation is seen from how well students understand the language style used, which is in accordance with student needs. there are several aspects that are assessed on language validation including; Straightforward, communicative, in accordance with language rules, and easy for students to understand. so that the development of this learning design has a positive influence on improving student learning outcomes that are adapted to the environment and the experiences that students go through.

At the end of the learning activity and using an environment-based learning design, a post test was carried out to see student learning outcomes. Based on the results of the post-test carried out, it can be seen that the post-test results of students reached an average of 17 with a standard deviation of 2.7. minimum completeness criteria.

Based on the results of students' classical mastery in table 4.11, it can be seen that the average classical learning mastery data reached 17 students who had reached KB 70%. After students' mastery in individual and classical learning is analyzed, 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 the results of 0.81 so the student's gain score is high. Based on the results above that there is an increase from before and after using. Besides being based on learning outcomes, the effectiveness of the media can also be seen by using a student response questionnaire using an environment-based learning design that strongly agrees as much as 73.3% and students who agree with the interactive media developed by researchers. Based on student responses, it is concluded that the learning media developed is said to be effective.

Based on the purpose of development research, namely to determine the feasibility and effectiveness of environmental-based learning designs, this can be said to be effective and suitable for all students. Because based on the data obtained, it shows that this environment-based learning design is effective in improving student learning outcomes. This learning design has advantages in making learning more optimal because learning needs are met. So that learning is adjusted to the readiness to learn, talents and learning styles of students which in turn has an effect on learning outcomes.

4. Conclusion

The development of an environment-based learning design using the Thiagarajan, Semmel and Semmel development model aims to improve student learning outcomes in terms of rights and obligations. From the results of research that has been done, the conclusions that can be described in this study are: environmental-based learning design tools in improving student

learning outcomes increased from small-scale trials with an average posttest of 75, while in large-scale trials with an average value of 85 with a percentage of 13.3%, it was concluded that this study experienced an increase on learning; and the learning tools developed have met the effective criteria.

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