Building Naturalist Intelligence through Integrated Threaded Material and Team Teaching Model

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Abstract. The development of multiple intelligence is an inclusive development that must be grown early. Therefore the development of teaching materials is needed by teachers as an effort to facilitate multiple intelligencess for children in early, especially in elementary school. This research can be the answer of the development needs of integrated learning materials Threaded and team teaching model to cultivate a multiple intelligence of elementary school students. The objective of this research is to produce the product of learning teaching of integrated Threaded model to grow the basic intelligence of elementary school students. This research uses a Research & Development (R&D) approach using 10 Borg & Gall stage designs which are modified according to context and implemented in 9 stages. Observation, Testing, Questionnaire Spreading, and Interview are data collection techniques used. The data analysis technique used in this study used descriptive statistical.

Keywords: Threaded Model, Naturalist Intelligence, Development

1 Introduction

The development of multiple intelligence is an inclusive development that must be grown early. Unequal intelligence can cause imbalances also in a person's behavior. The growth of multiple intelligence needs to be facilitated from an early age through appropriate teaching materials. The development of learning materials for the integrated learning thread model can be the answer to foster the multiple intelligence of elementary school students.

Threaded model is a continuous model or integration model that focuses on metacurriculum which is the heart of all subjects. Threaded model learning strategy prioritizes direct experience through the environment around students/naturalists [1, p. 2]. Through threaded model, it is hoped that students will gain an understanding of concepts they learn through direct experience in the environment and relate them to concepts on all subjects in learning.

The previous related research that has been carried out by Sugiarto [2] is to develop thematic material for class I semester 1 and 2 as an effort to instill students' thinking skills. Research conducted by Virganta, et al [3] succeeded in developing a learning model for reading and

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writing based on multiple intelligence for students with special needs. Research conducted by Sukartiningsih and Rukmi [4] developed interactive CDs as a medium to optimize the multiple intelligence of elementary school students. From these various studies, it seems that the development of multiple intelligence can be done through the development of learning strategies and media in elementary schools.

This research problem is focused on how to build naturalist intelligence through teaching material of the threaded model on elementary school students. The formulation of this common problem is further detailed into the specific problem formulation as follows: (1) What is the material in the threaded material? (2) How is the procedure of developing integrated Threaded learning model materials to grow the multiple intelligence of elementary school students?; (3) How is the practicality of integrated Threaded learning model materials to grow the multiple intelligence of elementary school students?; and (4) How is the effectiveness of integrated Threaded learning model materials to foster the multiple intelligences of elementary school students? The specific purpose of this research is to know the achievement of the development and application of threaded model to build naturalist intelligence on elementary school students. In general, the results of this study are expected to contribute as an effort to develop quality teaching materials, practical, interesting, and as an effort of learning methods close to the student environment in the school.

2 Literature Review

2.1 Multiple Intelligences

The definitions and set of criteria used by Gardner cover a larger area than just standard IQ tests and aptitude tests. According to Armstrong [5, p. 7], naturalist is expertise in the recognition and classification of many species of flora and fauna. Where naturalist intelligence is the expertise in recognizing and classifying various species of flora and fauna. The naturalist intelligence according to Gardner [6] is the ability to recognize, differentiate, express and categorize what is encountered in nature and the environment. The point is the human ability to recognize plants, animals and other parts of the universe. Naturalist intelligence is the ability to do categorization and hierarchy to the state of organisms such as plants, animals and nature [5, p. 10]. Muhammad [7, p. 91] defines that naturalist intelligence is the intelligence associated with the ability of individuals to recognize, understand, and recognize signs in the natural environment or natural changes by looking at the signs. Even the ability to see beauty and regularity so that this type of intelligence is more owned by environmental experts or who care about the environment. Natural intelligence involves the ability to recognize the natural forms around us; flowers, trees, nature, and animals [8, p. 79].

2.2 Integrated Threaded Learning Model

The integration contained in this learning model is carried out in two ways, namely the integration of attitudes, skills, and knowledge in the learning process and the meaningful integration of basic concepts [9, p. 9] The integrated threaded learning model is an integrated learning model across the field of study to achieve a particular learning outcome, such as multiple intelligences, critical thinking skills, social skills, or learning skills, graphic organizers, and technology.

Implementation of integrated learning is intended that the teaching materials are not used separately, but is a unified whole material and way of learning in accordance with the needs of student development [10]. In addition to having a flexible nature, integrated learning provides results that can develop in accordance with the interests and needs of children.

3 Methods

3.1 Research Design

This research uses 10 Borg & Gall [11] stages Research & Development (R&D) approach using that is modified according to context and implemented in 10 stages. The study was conducted within 6 months. The subjects of the study were seventh graders consisting of 75 elementary school students. Preliminary research activities include analysis of needs and constraints. The purpose of the activity at stage 1 is the assessment and identification of problems and realities that occur in the growth of intelligence of dual primary school students. Furthermore, activities are focused on expert validation. Expert tests include elementary school education experts, integrated learning experts, and technology learning experts. The next activity is a product revision based on limited test results. The next phase of research activities focused on the revision of integrated learning materials of threaded models to cultivate the multiple intelligence of elementary school students; field trials in the main field. Test results in the main field are used to revise the product. The result is a final learning material integrated learning threaded model to cultivate the multiple intelligence of elementary school students.

3.2 Data Analysis Techniques

The techniques used include: (1) Observation, (2) Testing, (3) Questionnaire Spreading, (4) Interview. The instruments of this study include Test Results Learning. Data processing in this study was carried out using descriptive statistical analysis techniques.

4 Results

4.1 Results of Threaded Model Integrated Material Development

Procedures of research activities undertaken following the research stages of the Borg and Gall model with the following steps. First, assess needs to identify goal (s) stages. To determine instructional objectives is done analysis on the needs of students. The cognitive intelligence of the child alone is not enough to be a complete human being. Many facts point to the existence of a human being who is high in cognitive intelligence, but very low in interpersonal and naturalist intelligence. The inequality of intelligence affects the inhibition of a person from becoming a useful and useful individual for himself and those around him. From the results of the analysis, then needed the right teaching materials to cultivate students' uniform intelligence evenly, especially naturalist intelligence which became the basis of students to learn.

Second, conduct instructional analysis. At stage 1 is the assessment and identification of problems and realities that occur in the growth of some elementary school students. Furthermore, the activities focused on the development of teaching materials, expert validation

and experimentation of developed teaching materials. Third, learners and contents analysis. Students as the subject of research are 75 students of 2nd graders of elementary school. In accordance with the stage of development proposed by Piaget, children at that age are at concrete operational stage. At this stage, students will more easily understand something when in concrete or real form.

Fourth, write performance objective. The purpose of teaching threaded model teaching materials is to cultivate the multiple intelligence of elementary school students. Fifth, develop assessment instruments. Instrument used is a multiple choice test instrument to be used before and after using threaded model integrated material in learning. Sixth, develop instructional strategy. The development of learning steps is outlined in the design of the lesson implementation. Seventh, develop and select instructional materials. At this stage the content development of naturalist intelligence in the materials of the threaded model. Eighth, design and conduct formative evaluation of instruction. The evaluation stages will be conducted through four stages: expert validation, individual trials, limited trials and field trials. Ninth, revision of instruction. The revised threaded model integrated material is done in accordance with comments and suggestions from the validator. Validator in this research that is Test expert include elementary school education expert, integrated learning expert, and technology learning expert. Tenth, design and conduct summative evaluation.

4.2 Materials on Integrated Teaching Materials Threaded Models of Naturalist Intelligence

The material of the threaded model to construct naturalist intelligence in the grade 2 primary school, is summarized in the following design. From the summary design of experimental threaded model materials, described the purpose of learning is as follows: (a) By using a standard measuring instrument, the student can state the result of measuring the length and weight of the object, (b) By observing images, students can compare the length and weight of two objects, (c) By observing a plant and animal, students can name the characteristics of plants and animals, (d) With question and answer, students can mention how to care for plants and animals, (e) By observing the environment, students can identify natural materials in the surrounding environment, (f) By observing images, students can group natural materials that can be useful, (g) With report text, students can read the simple text of simple reports about plants in the neighborhood, (h) By observing images, students can predict the text content of simple reports about plants in the neighborhood.

4.3 Practicality of Threaded Model Integrated Materials on Learning

Observations are made during learning activities. Observer evaluates every step of activity to know the implementation of learning using teaching material threaded model. Overall learning outcomes rose from 85% to 92.1% within the range of criteria. The data that have been processed shows the increase of students naturalist intelligence on the main trial. Overall, 75 students have achieved naturalist intelligence is expected. Twenty four students got the value of ≤ 80 with good criteria of naturalist intelligence, while 51 other students obtained a score of ≥ 80 with criteria is very good. The total number of grades in classical is 6,324 or 84.3 percent with very good criteria. The result of observation from the implementation of learning and the achievement of students' naturalist intelligence showed results far above the average. Observer observation results can be concluded that the practicality of threaded model integrated material developed has been met to practice naturalist intelligence in elementary school students.

4.4 Effectiveness of Threaded Model Integrated Materials on Learning

The results of the student learning test are used to determine the effectiveness of the threaded model integrated learning material. Indicators observed on students' naturalist intelligence are (a) Compare the measurement of the length and weight of nearby objects using standard and non-standard units; (b) Mention the healthy environment and unhealthy environment around and how to maintain environmental health; (c) To identify and infer the results of natural observations about the flora and fauna; and (d) Creating simple reports in the form of written text, oral, visual, related to the observation of nature about the flora and fauna. The indicator aims to bring students closer to the knowledge of the natural life around them.

Tests related to student learning were tested on 75 students which were then calculated using the product moment correlation formula, with the criteria for valid questions if the $r_{count} > r_{table}$, which is 0.514. There are 20 valid questions and are used as a test instrument for learning outcomes. Next, reliability test using Formula Spearman Brown. From the calculation results, the reliability of the problem was obtained as much as 0.571 where the figure indicates medium reliability referring to Guilford's interpretation of reliability. Questions that have been tested for validity and reliability will be used for pretest and posttest questions in experimental and control classes during field trials. The results of the pretest and posttest will be tested with a t-test to determine the effectiveness of the threaded model teaching materials. However, before being tested with a t-test, the pretest and posttest results are first tested for normality using the chi square formula. After the normality test, the next step is to test the homogeneity to determine whether the two classes are homogeneous. Homogeneity test is carried out using the variance formula. The sample is said to be homogeneous if the value of Fh<Ft, with Ft 2.12. Once it is known that the two classes are normal and homogeneous distributions of data, the next step is to perform a t-test with the criterion used being Ho accepted when the $t_{count} < t_{table}$. Based on the calculation results, the student's learning outcome after studying is 2.63. It can be interpreted that 2.63 ≥ 2,093, it can be concluded that Ho was rejected and Ha was accepted. Thus, it can be concluded that there is a significant difference between the learning outcomes of experimental class students and the control class.

Students work together in groups, contribute and receive opinions in tasks and discussions, and develop leadership. Overall of 75 students exhibit natural intelligence. In all aspects of the indicators with a total value of 2085.3 or 83.4% are at very good criteria. It can be spelled out that there are 21 out of 75 students who get a total score above 80% or can be said to be on very good criteria. The results of all the major trials on the effectiveness of learning tools show excellent results. Referring to these data, it was concluded that the development of threaded model teaching materials is very effective for improving naturalist intelligence in grade 2 elementary school.

5 Discussion

The material in developed materials has been adjusted to Gardner's [6] opinion of naturalist intelligence. Naturalist intelligence includes the streets in the open, flora, and fauna. Students are taught to learn more closely with nature by looking out the window. The results of all validation states that the research tools and instruments are appropriate for use. Based on the result of feasibility analysis, the experimental material of threaded model is used to improve

naturalist intelligence in grade 2 of elementary school. Practicality of teaching materials threaded model is known from the observation of the implementation of learning. Observation of the implementation of learning involves two observers. Based on the observation and questionnaire, it was found that the integrated teaching material of threaded model is very good or practical used to improve naturalist intelligence in grade 2 of elementary school.

This is in accordance with the Ministry of Education and Culture [9, pp. 35–37] which states that learning activities that are compatible with a scientific approach are observing, questioning, gathering information, associating and communicating The effectiveness of integrated learning materials of threaded model is known based on the students' learning result test. Result of test validity indicates that there are 20 valid questions. Next, 20 such questions serve as test result of learning. Based on test t-test which have been done, got result equal to 2,63. The tdable for df 20 is 2.093. From these results can be interpreted that $2.63 \geq 2.093$, it can be concluded that Ho is rejected and Ha accepted. Thus it can be concluded that there is a significant difference between the learning outcomes of the experimental class students and the control class. Thus, learning using threaded model materials for naturalist intelligence in grade 2 primary school is evidenced by significant differences in learning outcomes between experimental and control classes.

6 Conclusion

Based on the results of research and discussion, it can be concluded, among others: (a) The integrated teaching material of threaded model is feasible to be used in learning to improve naturalist intelligence in grade 2 elementary school students. (b) Teaching material threaded model practically used in learning. This can be seen from the results of a practical questionnaire filled by four grade IV primary school teachers and the results of calculating the percentage of implementation. Result of percentage of implementation of the material of threaded model is very well achieved. Implementation of learning by using integrated materials threaded model is 83,4% with very good category. (c) Threaded instructional material is effectively used in learning in grade 2 of elementary school. It is based on the result of t-test, in mulanilai t arithmetic> t table, that is 2,63> 2,086. Based on this, Ho is rejected and Ha accepted. From the research result Development of teaching materials threaded model to improve naturalist intelligence in grade 2 of elementary school, hence can be given suggestion that is: (a) Feasibility Suggestion. Suitable threaded instructional materials are desirable and can be disseminated for second grade students. (b) Suggestion of Practicality. The materials of integrated threaded models are effective. It is expected the threaded model integrated material in learning with appropriate material in the media so as to effectively improve learning outcomes.

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