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The Character Education Through Analogy Learning Implementation on Vector Concepts

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Abstract

The problem of this study is the acts of the criminal increase in North Sumatra, so it needs the characters' building begin from school. Besides, the teacher of physics should be able to instill character values through analogy learning about the concept of physics. This study aims to determine the results of physical knowledge and student responses after applying analogy learning to instill character values. The subjects of this study were X-IPA 1 students of SMA Negeri 1 Rantau Utara. This research is descriptive qualitative with two stages, namely the preparation stage (referring to the development that uses the 4-D model namely Defines, Design, Develop, and Disseminate) and the implementation stage. While the instruments used in this study are observation sheets on the implementation of RPP, student response questionnaires, and tests of knowledge competency results. The conclusions of this study are there is an increase in the results of students' physics knowledge competencies and a positive response to the implementation of analogy learning in instilling character education through the concepts of physics taught.

Keywords: character education, analogy learning method, physics

INTRODUCTION

In the last seven years, Indonesia has faced with a variety of complex problems, one of which is the problem of criminal acts, which continue to increase from year to year. From 2011 to 2016, the number of incidents of crime in Indonesia fluctuated. As seen in FIGURE 1, based on data records in the Guidance and Operations Bureau, the National Police Headquarters showed the number of crime total in Indonesia in 2011 was 347,605 cases, a decrease of 341,159 cases in 2012, increasing in 2013 to 342,084 cases, dropped to 325,317 cases in 2014, rise again in 2015 to 352,936 cases (Badan Pusat Statistik 2017).

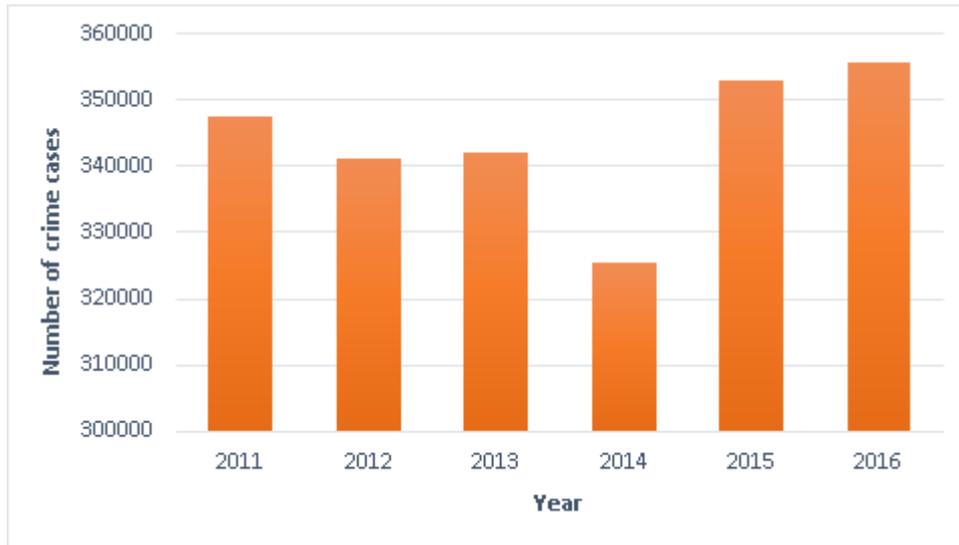


FIGURE 1. The Statistics of Crime Total in Indonesia

The Head of BNN RI Komjen Budi Waseso while speaking at the Indonesian narcotics emergency seminar, at the Universitas Sumatera Utara Student Center, stated that in 2015 drug users had reached 5.9 million with North Sumatra being the most drug users third in Indonesia (Defaza 2016).

Related to the facts above, the most responsible for overcoming this problem is education. This is in line with the functions and objectives of the education system based on Republic of Indonesia Law No. 20 of 2003 articles 3 concerning the National Education System which states that national education functions to develop and shape dignified national character and civilization in order to educate the nation's life, aiming at developing potential students to become human beings who believe and fear God the Almighty noble, healthy, knowledgeable, capable, creative, independent, and a democratic and responsible citizen (Samani 2011).

One effort that has been made by the government to overcome this problem is the establishment of the 2013 Curriculum (K-13) based on character education, where attitudes and behavior (morals) included in an essential aspect of assessment. Character education is education that is not only oriented to the cognitive elements but is more oriented towards the potential coaching process that exists in the students, developed through habituation of good traits, namely teaching good character values (Rozi 2012). However, in its implementation, this curriculum cannot be fully applied to all schools related to several things, so we need other strategies to implement the character education remains an application without having to apply K-13.

It is time for parents and teachers to give special attention to students not only limited to moral knowledge, but rather to moral education to form the expected character. From the results of the research conducted by Pertiwiningrum (2013), the score of the proportion of TP of moral knowledge was reached 0.95 out of 6 TP had achieved completeness, meaning that students were not too difficult to achieve moral knowledge. The problem that arises now is that the score of high moral knowledge should be followed by a moral attitude that is commendable, but the reality in the field shows that moral decadence is increasingly rampant, namely the quantity and quality of juvenile delinquency are very alarming. It turned out that there was no significant relationship between moral knowledge and moral attitudes (Pertiwiningrum 2013). It following the results of the study of the development of learning devices using meaningful learning models for junior high-school students by Sartika (2010) which states that the value of moral sensitivity has nothing to do with the acquisition of cognitive values of students. These facts prove that the high level of moral knowledge is not proportional to his moral attitude.

The teacher as one of the implementers of education has an essential role in overcoming this problem. Character education should not only be borne by special subject teachers but also the responsibility of teachers of other fields of study, especially in physics. However, in reality, there are

still many teachers who think that character education with physics is two separate things so that the content of character education cannot be given through physics teaching in the classroom.

Many physics topics, processes and attitudes to learning physics in schools can be used by teachers to instill character values. One example is an understanding of the concepts of Newton's Law and other Physical Laws that can help students realize the natural order and obedience to natural law. As a result, students can admire the Creator who governs everything. An understanding of the solar system with all the laws and theories can also help students to respect God the Creator. Then the value of religiosity can be developed through understanding and admiration for the system of the universe. Students are also helped to obey the existing laws and rules of life. Of course, to be able to find that value, the teacher needs to help students reflect (Suparno 2012).

Furthermore, on the topic of vectors, vector quantities are quantities that have values and directions. Therefore, humans should live valuable and have a direction to achieve all goals in life. Reflection can be done by analogizing the concept of life into the concept of physics. Learning analogy is learning that explains a concept or topic by analogizing with an event that is easily understood by students (Ramadhayani 2015). In relation to physics teaching, where the teacher explains the concept of physics as an analogy in instilling character values to students.

Based on the explanation above, researchers were interested in researching Character Education through the Implementation of Analogy Learning in Vector Concepts. Our purpose was to find out the results of physics knowledge competencies and student responses after applied analogy learning to instill character values.

RESEARCH METHODOLOGY

This study is descriptive qualitative research, which aims to determine the results of the knowledge competency of physics and student responses after being taught through analogy learning. Before implementation, researchers develop learning devices that will be used first concerning the 4-D model (four D models), namely Define, Design, Develop and Disseminate. In this study, it will only be carried out in three stages, namely Define, Design, and Develop.

This study uses the design of One Group Pretest-Posttest Design. Observations made before the experiment (O1) are called Pretest, and post-experimental observations (O2) are called posttest. The subjects were all students of class X-IPA 1 in SMA 1 Rantau Utara, Labuhanbatu, which numbered 38 students. The instruments were the observation plan for lesson plans, student response questionnaires, and test results.

The procedure in this study consists of two stages, namely the preparation and implementation stages. The preparation stage is the design stage of the development of learning devices while the implementation phase is the implementation stage of learning in the classroom.

Preparation phase

The preparation stage in this study uses a 4-D model, namely Define, Design, Develop, and Disseminate. In this study, it will only be carried out in 3 stages, namely Define, Design, and Develop.

Define

- Front-end Analysis is conducted to find out fundamental problems in the development of learning innovations through analogy in teaching physics concepts. At these stage facts and alternative solutions are raised so that it is easier to determine the initial steps in developing appropriate learning innovations.
- Learner Analysis by observing the characteristics of students. This analysis consider the characteristics, abilities, and experiences of students. Analysis of students includes character (attitude and morals) and academic abilities.
- Concept Analysis aims to determine the content of the material in the learning that will be developed. Concept analysis is made in learning concept maps, which will later be used as a

means of achieving certain competencies, by systematically identifying and compiling the main parts of the learning material.

- Specifying Instructional Objectives are conducted to determine learning achievement indicators based on material analysis and curriculum analysis.

Design

- The criterion-instrument construction based on the preparation of learning objectives that become a benchmark for students' abilities.
- Media selection is carried out to identify learning media that are relevant to material characteristics and following the needs of students.

Develop

- At this stage, a limited field trial is carried out to find out the results of the application of innovation through analogies in teaching physics concepts in the classroom.
- Make initial observations or give a pretest to students to find out the conditions and initial abilities of students.
- The teacher provides the physics lesson material with analogy learning in teaching vector concepts in X-IPA 1 class according to the objectives. This stage is carried out for four meetings.
- Make observations after the experiment or give posters to the object to be measured.

Data collection technique

Observation of the Implementation of Lesson Plans

To measure the feasibility of Lesson Plans which contains character education through analogy in teaching physics concepts.

Student Response Questionnaire

To find out the response of students after being taught using analogy learning in teaching vector concepts.

Learning Outcomes Test

This test is to determine the increase in student understanding after applied to learn through analogy in the teaching of physics.

Data analysis technique

Observation of the Implementation of Lesson Plans

The implementation of RPP was analyzed using qualitative descriptive analysis. Observation data provided by two observers use the RPP Implementation Instrument which contains the criteria for each learning phase assessed by giving a checklist on the implementation column (yes or no) and in the assessment column (4: very good, 3: good, 2: good enough, 1: not good), then the percentage will be searched for the implementation of the steps in the lesson plan carried out by the teacher during the learning process.

Student Response

Data analysis about students' responses in the following learning uses qualitative descriptive techniques. Students answer Yes value (1) and students answer no value (0). Data were analyzed based on groups of respondents who answered "Yes" and groups of respondents who answered "No." The response to every aspect in question is tabulated, then the percentage is calculated and put into specific categories.

Learning Outcomes

This test is to see an increase in student understanding after applied learning through analogy in the teaching of physics.

RESULTS AND DISCUSSION

Description of Early Observation

At this stage, the researcher made an initial observation to the school to find out the initial conditions of the research subject. In this case, the subjects of the study were the X-IPA 1 class of North Rantau 1 State Senior High School, which 38 students. The research subject was determined based on the results of the discussion of the principal, the deputy headmaster of the curriculum field, and the teacher in the field of physics studies regarding the learning process. The initial observation carried out was in the form of giving a pretest to students in the form of multiple-choice tests to see the students' initial knowledge of physics.

The average score of the student's pretest obtained is 34.5 where the highest score is 45, and the lowest score is 10. This data shows that the subject condition has never been taught the concept of magnitude and vector so that when research is conducted it does not affect data acquisition because all students considered the same. Based on the results of this survey, researchers tried to combine Character Education through Analogy in Teaching Class Physics Concepts at the High School level.

Observation of the Implementation of Lesson Plans

The lesson plan is prepared based on the number of face-to-face meetings during the research, which are four times face to face. The Lesson Plans developed in this research is Lesson Plans, which teaches character education (attitude and morals) through analogy. Observation of the learning process is directed at four main activities, namely: introduction, core activities, closing, and an overview of the class atmosphere. Every meeting on the teaching and learning process is observed by an observer in the class. Observers pay attention to the suitability of teaching with Lesson Plans that have been prepared during the teaching and learning process takes place.

After careful observation during the learning process takes place, the average score of the categories obtained for each phase is 3.9 with a very good category. This shows that overall learning can be said to be implemented well according to what is seen from the observation category which is very good. Furthermore, for the score of the implementation percentage of Lesson Plans from the first meeting to the fourth meeting in a row are as follows:

TABLE 1. Percentage of Implementation of Lesson Plans

Meeting	Implementation Percentage
1 st	90
2 nd	95
3 rd	94
4 th	97
Average	94

Seeing the results of the percentage of learning implementation, the implementation of learning in accordance with the RPP scenario has been developed with an average percentage of 94%, so it can be concluded that attitudes and understanding of students' concepts are not influenced by the

behavior of teachers who teach, but are influenced by the use of analogies in learning emphasizing character education.

Learning Outcomes

At this stage, the students' vector knowledge competency learning outcomes were measured after analogy learning was applied. According to Yuningsih (2018) in his research stated that the analogy approach is a reasoning process that compares two objects that have similarities to produce new knowledge based on the knowledge that has been possessed by students. This analogy approach serves as a bridge to understand material that is difficult for students to reach through phenomena/objects around that are familiar to them. The strength of the analogy is not limited to material in the form of concepts but rather the types of material processes and structures. Moreover, the use of analogies in learning makes it difficult for students to forget the concepts that have been imprinted on their brains.

In this study, the instrument used to measure the competency of students' knowledge is to provide learning outcomes tests with multiple choice forms totaling 15 questions. Students are advised not only to choose the correct answer in the answer sheet provided, students are also asked to write down the reasons for the answers chosen. This is done to avoid students who answer questions by guessing.

The results of measurements from the tests given indicate that there is an increase in the understanding of students' competency knowledge about vectors. This is corroborated by the difference in the value of the initial observations (pretest) with the value of the learning outcomes test (posttest) that has been obtained. The following is the recapitulation of students' pretest and posttest scores on vector material.

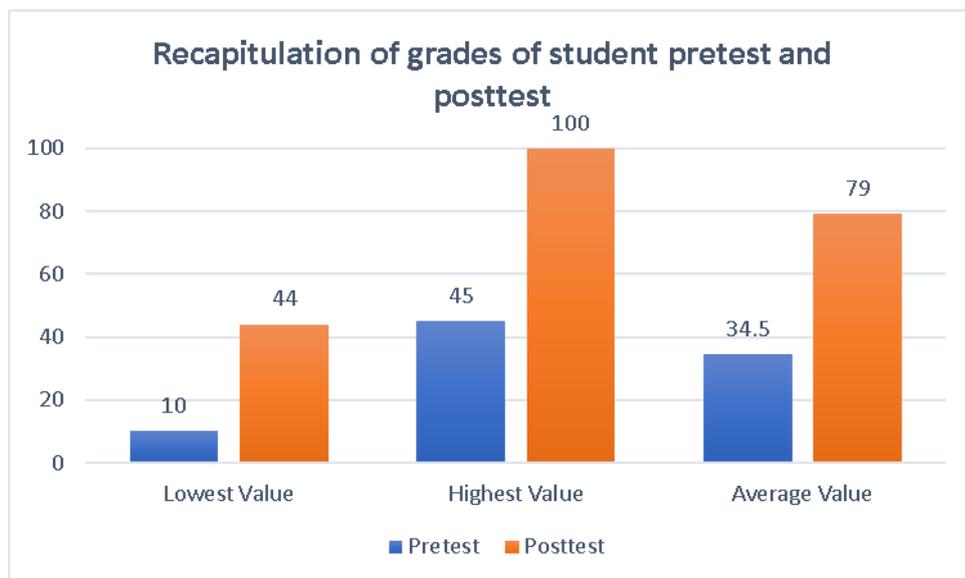


FIGURE 2. Recapitulation of grades of student pretest and posttest

Based on FIGURE 2 shows that the average posttest value of students is higher than the average value of the pretest, as well as the highest and lowest scores at posttest also higher than the highest and lowest values at the pretest. With the acquisition of a posttest average value of 79 indicates that this value has reached the KKM in the field of physics studies which is 75. From the results of the learning test obtained, 34 students were declared complete reaching the KKM while the other four students had not achieved KKM completeness. This happened because these four students were not present in the learning so several material concepts were passed so that it was difficult to answer the questions when the tests were conducted. Although the lowest value of students at posttest is 44, this value has increased considerably compared to the lowest value at the pretest that is 10. Looking at the data, it can be stated that analogy learning in vector material can improve students' physics knowledge competencies about vectors. This is also in line with the results of the Apriliani study

(2015) which states that by using the analogy learning method, students will increasingly appreciate the theoretical concepts taught and students will be helped to learn actively.

Student Response

Student responses to character education through the application of analogy learning are obtained from the opinions of students during the teaching and learning activities in the classroom. Student opinions are expressed in the form of "yes" or "no" answers through 15 questions in the student response questionnaire. The question in the questionnaire concerns the response of feeling happy/unhappy during the analogy learning which includes several aspects, namely understanding the content of character values in the concepts learned, delivering interesting material, and a pleasant learning atmosphere. Next is the display of response questionnaire data obtained.

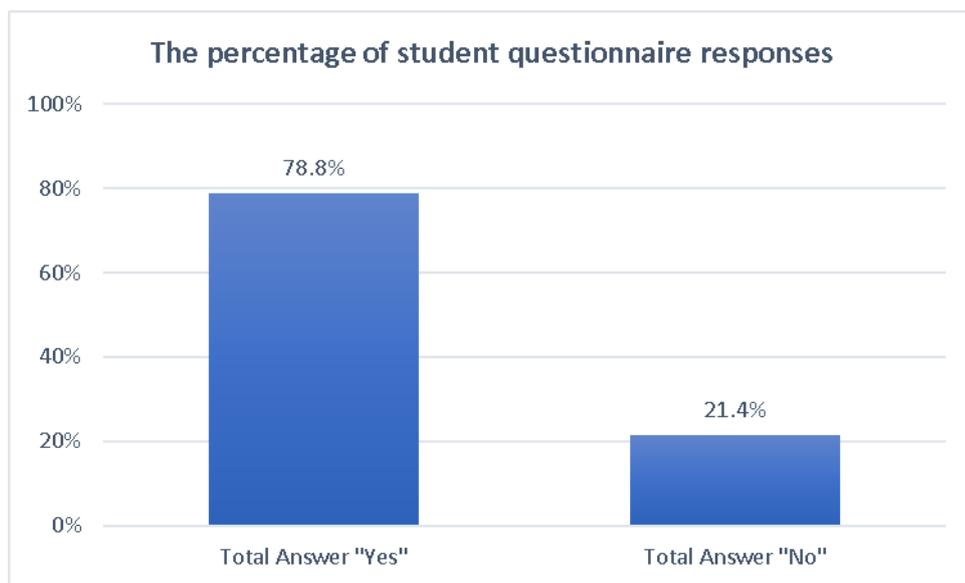


FIGURE 3. The percentage of student questionnaire responses to character education through the application of learning analogies.

The presentation of data in FIGURE 3 shows that the average student who responds positively by answering "yes" is 78.8% while the average student who responds negatively by answering "no" is 21.4%. With the acquisition of the percentage of positive responses of students above 50%, this indicates that students are happy with the application of learning analogies in physics or in other words students are positive for the application of learning analogies to the concept of physics. This is in line with the changing character of students who are getting better both attitudes and morals. Students assume there is a unique feature in the application of this analogy learning, that is, students are invited to discover and reflect on character values in the concept of vectors. Initially, students assumed that vector material was only one concept of knowledge that had nothing to do with character values, but after applied analogy learning, students became aware that vector concepts also had character values that were able to build an attitude and moral sensitivity. This supports the results of research conducted by Maunah (2015) which states that the impact of implementing character education is very good for students, namely: (1) high motivation to always be honest at all times; (2) do not lie with anyone; (3) always respecting the older and loving others; (4) grateful for what has been received; (5) worship in congregation; (6) respect for the work of others; (7) trained to be a strong future leader; (8) trained to do tasks creatively; (9) biased thinking independently; (10) trained in caring for the environment; (11) are used to helping friends who need help, and so on.

Besides, according to Sudar (2014) two things that make value unite with education; First, all educational decisions without exception depend on all the underlying work values; Second, education always conveys value to others, both hidden and open. By planting character values through an analogy in teaching physics concepts, students become easier in remembering and understanding the

concepts of the material itself. Therefore, the implementation of analogy learning was responded positively by students.

CONCLUSIONS

This study can conclude that character education through the implementation of analogy learning on vector concepts can improve the results of students' physical knowledge competency abilities. Besides, the application of analogy learning on vector concepts was also positively responded by students.

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