IDENTIFICATION OF PHYSICAL CONCEPTS PROBLEM IN ANSWERING THE NATIONAL EXAM QUESTIONS AT SENIOR HIGH SCHOOL IN PESISIR SELATAN DISTRICT

THESIS UNDERGRADUATE

Submitted As One Of The Requirements To Get A Degree

Bachelor Of Education

By :

INNES ANDRIANI

17033136/2017

DEPARTEMENT OF PHYSICS EDUCATION
DEPARTEMENT OF PHYSICS
FAKULTY OF MATH AND SCIENCE
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Name   : Innes Andriani

Student ID   : 17033136

Study Program   : Physics Education

Department   : Physics

Faculty   : Mathematics and Natural Science
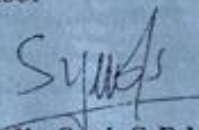
Padang, 27 October 2021

Approved by:

Head of Department

Dr. Ratnawulan, M.Si
NIP. 19690120 199303 2 002

Supervisor

Silvi Yulia Sari, S.Pd, M.Pd
NIP. 19880629 201404 2 001

PASS RATIFICATION UNDERGRADUATE THESIS EXAMINATION

Name   : Innes Andriani

Student ID   : 17033136

Study Program   : Physics Education

Departement   : Physics

Faculty   : Mathematics and Natural Science

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It was declared that he had pass after being defended in front of the Thesis Examiner Team for the Departement of Physics, Faculty of Mathematics and Natural Sciences, Universitas Negeri Padang
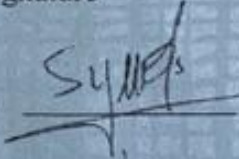
Padang, 27 October 2021

Testing Team

Name		Signature
1. Chairman	: Silvi Yulia Sari, S.Pd., M.Pd	1.
2. Member	: Dra. Yenni Darvina, M.Si	2.
3. Member	: Drs. Gusnedi, M.Si	3

STATEMENT

I hereby declare that:

1. My scientific work, the final project in the form of a thesis with the title: "Identification of Physical Concepts Problem in Answering The National Exam Questions at Senior High School in Pesisir Selatan District", is my original work.

2. This paper is purely my own ideas, formulations, and research without any help from other parties, except the supervisor.

3. In this paper, there are no works or opinions that have been written or published by others, except in a writing that is clearly stated as a reference in the manuscript by mentioning the author and included in the literature.

4. I have made this statement in truth and if there are deviations in this statement, I am willing to accept academic sanctions in the form of revocation of the degree that has been obtained because of this paper, as well as other sanctions in accordance with applicable legal norms and provisions.

Padang, October 27th 2021

Who made the statement

Innes Andriani
17033136/2017

i

ABSTRACT

Innes Andriani, 2021. "Identification of Physical Concepts Problem in Answering The National Exam Questions at Senior High School in Pesisir Selatan District"

The 21st century is a century with an education system that refers to the 2013 curriculum which requires teachers to apply learning that is directed to find out information so that it can help students to have a deeper mastery of concepts. This is related to the physics learning process carried out by teachers in schools such as students not only being required to have mathematical abilities, but also the ability to understand physics concepts. The results of the initial documentation study show that in education center data (2018) the average value of the National Exam in physics at Senior High School level in Pesisir Selatan District is still relatively low. The low value of the National Exam (NE) proves that there are still many students who have difficulty in working on the questions. The number of errors made by students in working on questions can be an indication of the extent to which students can understand the material that has been conveyed by the teacher. Therefore, research analysis of the problematic physics concepts was carried out in answering the questions of the National Exam at Senior High School in Pesisir Selatan District.

This research is descriptive research with a qualitative approach. The population of the data in this study was all Senior High School that held the National Exam in Pesisir Selatan District which consisted of 21 schools. Sampling is done by using the technique *Proportionate Stratified Random Sampling*. The sample of this study was 6 schools that held the National Exam in Senior High School in Pesisir Selatan District. The data in this study were taken from the 2018 and 2019 Physics National Exam in education center data (2018) and also used an instrument to identify problematic physics concepts in answering the National Exan questions at Senior High School throughout Pesisir Selatan District, as well as data collection techniques through documentation study.

Based on the research that has been done, the results of the identification of problematic physics concepts in 2018 consist of 6 main materials including Measurement and Kinematics material with an error percentage of 58.68%; Dynamics with an error percentage of 69.33%; Work, Energy and Collision with an error percentage of 64.79%; Heat with an error percentage of 57.74%; Wave and Light with an error percentage of 65.95%; and Magnetism and Core Physics with an error percentage of 45.45%. Then, in 2019 it consisted of 4 main materials including Mechanics with an error percentage of 58.16%; Wave and Optics with an error percentage of 65.87%; Thermodynamics with an error percentage of 68.23%; and Magnetism and Modern Physics with an error percentage of 57.90%.

Keywords: Identification, Physics Concepts, National Exam

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Hopefully, all the guidance, help, and attention that has been given to the author will be a good deed and get a reply from Allah SWT. The author realizes that in this thesis report there are still shortcomings and weaknesses. Therefore, the writer expects suggestions to improve this thesis. Hopefully, this thesis is useful for readers.

Padang, October 27th 2021

Author

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INTRODUCTION

A. Background of Research Problem

The 21st century is a century with very rapid technological developments. This very rapid technological development has an impact on various fields, namely economic, political, social, and cultural as well as making linkages between a country and other countries which is also called globalization. The era of globalization has changed the world in various aspects of social life. The free flow of information and the variety of resources in the interaction environment between countries have brought about unprecedented changes. This certainly has a positive impact on the education that is applied, so that it can adapt and meet all the demands of the 21st century.

Education is an effective thing to renew the world. Education is also used as a stepping stone to finding out all the information and existing knowledge. That way, efforts to improve the quality of education in Indonesia must be further improved, so that it can produce a better future generation for the progress of a nation

The education system in Indonesia refers to the 2013 Curriculum. The 2013 curriculum is a curriculum that implements student-centered learning, while the teacher only acts as a facilitator. Student-centered learning must be applied optimally in fulfilling

demands of the 2013 Curriculum. Learning in schools to be more optimal must have a quality education system in order to form human resources with strong competitive capabilities.

According to Law no. 20 of 2003 Article 1 Paragraph 1 Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious-spiritual strength, self-control, personality, intelligence, noble character, and the skills they need. society, nation, and state. Education can also be used as a foundation in advancing a nation which plays an important role for the population in Indonesia in developing and increasing its potential.

One of the potentials that need to be increased is the intelligence of students as described in the law. The intelligence of students can be improved through the development of their thinking skills in solving problems. This thinking skill is very important in describing and explaining a phenomenon.

Physics is a branch of Natural Sciences (IPA) which studies natural events. Physics is also a science that deals with how to find out about nature systematically, in the form of discoveries, mastery of a collection of knowledge. This knowledge includes facts, concepts, or principles as well as further development processes in applying knowledge in everyday life (Depdiknas, 2006:159).

In physics lessons, students are directed to find out, so that it can help students to gain a deeper mastery of concepts (Permendiknas No 22 Tahun 2006). Understanding the concept of physics is something that is very important to solve physics problems. Understanding this concept can help students solve problems not

only in the learning process but also in everyday life. Therefore, in the process of learning physics, students are not only required to have mathematical abilities, but also the ability to understand the concepts of physics.

According to the Big Indonesian Dictionary concept means understanding, a mental picture of objects, processes, opinions (understanding), designs (ideals) that have been thought out. In order for all activities to run systematically and smoothly, a plan that is easy to understand and understand is needed. In planning these activities there is an idea or idea that is carried out or carried out by a certain group of individuals so that it can be shaped into a concept map

Improper implementation of learning activities in learning Physics is a factor that affects students' low mastery of Physics concepts. Classroom learning activities have not been able to optimally train aspects of concept mastery (Hariadi, 2009; Oktasari 2016).

The concept mastery aspect refers to Bloom's revised Taxonomy (Anderson & Krathwohl, 2001) memiliki enam tingkatan kognitif tersebut yaitu mengingat (C1), memahami (C2), mengaplikasi (C3), menganalisis (C4), mengevaluasi (C5) dan membuat (C6). which has six cognitive levels, namely remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), and making (C6).). Based on the results of the 2011 Trends in Mathematics and Science Studies International (TIMSS) study in the field of science, it shows that Indonesia ranks 40th out of 42 countries that follow or reach 3rd rank from the bottom, higher than Morocco and Gana (Wasis, 2015). Likewise, the Program for International Student Assessment (PISA) in 2012 showed that Indonesia's average PISA score was very

low at 382 of the international average of 501 and ranked 64th out of 65 participating countries. This shows that students in Indonesia on average have not been able to relate and communicate various science topics, especially science concepts that are abstract and complex.

Education center data (2018) shows that the average value of the National Exam (NE) in physics at senior high school level in Pesisir Selatan District is still relatively low. The low score of the National Exam (NE) of students proves that there are still many students who have difficulty in working on the questions. Learning methods, interests, media, and situations and conditions when learning takes place can be one of the causes of students experiencing difficulties and errors in working on questions. The number of errors made by students in working on questions can be an indication of the extent to which students can understand the material that has been conveyed by the teacher

Teachers must also be able to make evaluations that can train students to be more active in critical and creative thinking in learning in addition to using models and innovations in the learning process so that it is hoped that every student has good conceptual understanding skills. The difficulties experienced by students in working on the questions result in low learning outcomes and understanding of students' concepts, so it is necessary to analyze the problematic concepts in the National Exam material.

The results of the documentation study that has been carried out by researchers by collecting the 2018 Physics National Exam scores in Pesisir Selatan District. Then, the researcher identified the problematic physics concepts from the

exam. The results of data identification from the Center for Assessment and Learning indicate that the level of understanding of the concepts and learning outcomes of students is not optimal. The ability of students to answer questions is also not optimal. This can be seen from the 2018 Physics National Exam scores for each material in 21 schools that held the Physics National Exam in Pesisir Selatan District as shown in Table 1.

Table 1. Data on Physics National Exam at Senior High Schools in Pesisir Selatan District.

Number	Senior High School Name	National Exam Average Value
1	SHS 2 RANAH PESISIR	31,70
2	SHS 1 LUNANG	31,83
3	SHS 1 BAYANG	32,15
4	SHS 3 LENGAYANG	32,34
5	SHS 2 KOTO XI TARUSAN	34,28
6	SHS 1 KOTO XI TARUSAN	35,37
7	SHS 1 SUTERA	35,73
8	SHS 2 BAYANG	35,83
9	SHS 1 BATANG KAPAS	36,43
10	SHS 1 AIR PURA	37,86
11	SHS 1 LINGGO SARI BAGANTI	39,56
12	SHS 1 SILAUT	39,82
13	SHS 1 PAINAN	40,06
14	SHS 1 LENGAYANG	40,88
15	SHS 1 NAGARI IV BAYANG UTARA	41,39
16	SHS 1 RANAH PESISIR	41,48
17	SHS 2 LENGAYANG	43,89
18	SHS 2 PAINAN	44,85
19	SHS 1 BASA AMPEK BALAI	46,60
20	SHS 1 PANCUNG SOAL	53,70
21	SHS 3 PAINAN	58,64

Table 1. shows that the ability of students in several schools in answering the questions of the National Exam is still relatively low. The order of data from the average National Exam scores above was obtained based on the National Exam scores of students who took part in the 2018 Physics National Exam which showed that SHS 2 Ranah Pesisir with the lowest average National Exam score was 31.70 and SHS 3 Painan with the highest National Exam average score was 58.64 compared to the average score of the National Exam in the Province, which is 44.25 and the average score of the National Exam, which is 44.00. Then, through the 2018 Physics National Exam scores, researchers took a sample of 6 schools that held the

National Exam in Pesisir Selatan District as research samples with low, medium, and high categories.

Pesisir Selatan District is a district in West Sumatra that has a Physics National Exam score which is still below the average West Sumatra Province Physics National Exam score of 39.25 while the West Sumatra Province Physics National Exam average score is 44.02 so the researchers set Pesisir Selatan District as research place . From this, we can know that the ability of students to work on questions is still relatively low or not yet optimal so that student's understanding of physics concepts must be improved in order to achieve the demands of the 2013 curriculum.

Based on the description of the problem above, it turns out that there are several factors that cause students National Exam scores in answering National Exam questions to be still low, so it is necessary to identify problematic physics concepts in answering National Exam questions. Therefore, to find out the problematic physics concepts in answering the National Exam questions, the researchers identified the problematic physics concepts in answering the National Exam questions in Public Senior High Schools at Pesisir Selatan District in 2018 and 2019. The reason the researchers identified 2018 and 2019 is that in that year learning using the 2013 Curriculum has been effectively implemented in schools in the process of learning activities, so, from this the researcher wants to do further research with the title **"Identification of Physical Concepts Problem in Answering The National Exam Questions at Senior High School in Pesisir Selatan District".**

B. Identification of the Research Problem

In the background that has been described, there are several problems that occur. To make the focus of the problem in this research clearer, the researchers identified several of these problems, including:

1) The application of physics concepts in the learning process has not been optimally implemented in school learning activities in accordance with the 2013 curriculum in the 21st century.

2) Based on the average value of the 2018 National Physics Exam in Pesisir Selatan District, it is known that the average score of the National Exam in several senior high schools in answering the National Exam questions is still relatively low.

3) Students are less active in the learning process which causes the learning material to be difficult for students to understand.

4) Lack of learning methods, media, and student interest in the learning process can cause students to experience difficulties and errors in working on questions.

C. Limitation and Scope of the Problem

Based on the results of the identification of the problem, in order to make the research more focused, the following restrictions were held :

1) The results of the National Exam identified were the results of the 2018 and 2019 National Exam at Senior High School in Pesisir Selatan District.

2) Identification is carried out on physics concepts that are problematic in answering the National Exam questions.

D. Formulation of Research

Based on the research problems that have been proposed, a problem formulation can be made. The formulation of the problem in this study are : "Which physics concepts are problematic in answering the National Exam questions at Senior High School in Pesisir Selatan District?"

E. Research Objectives

Based on the formulation of the problem posed, a research objective was made. The purpose of this study is to find out which physics concepts are problematic in answering the National Exam questions at Senior High School in Pesisir Selatan District.

F. Research Benefits

After doing the research, it is hoped that the results of this research will be useful for various parties, including :

1) For researchers, as a science that is now in development in the field of research, it adds insight and knowledge about problematic physics concepts in answering National Exam questions.
2) For teachers, it is a consideration for improving the learning process.
3) Students, to train and improve the competence of students by mastering the concepts of physics in the National Exam material.
4) Other researchers, as material or input to continue and develop research in the future.