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THE IMPLEMENTATION OF CURRICULUM 2013 IN EXPEREMENT OF OPTIC COURSE THROUGH THE DEVELOPMENT OF STUDENT WORKSHEETTO ESTABLISH SCIENTIFIC ATTITUDE IN PHYSICS EDUCATION PROGRAM

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Abstract

This study is about the Development of StudentWorksheetin Optical course which is develop scientific attitudes through learning. The Scientific which is expected through Student Worksheeton learning is; curiosity responsibility, free thinking, honesty and discipline. Through this research of development, the result in this research that Worksheet are worth to be conducted in learning process to establish the scientific attitudes in Optical course particularly for Physics Education Study Program.

Keywords; Student activity sheets, educational scientific attitude

PREFACE

Learningis avery fundamental thingthat can not beseparated fromhuman life. Alongwiththe development of societyandthe need sareincreasing, the government is tryingtoimprove theeducation.Itshould be done to preparethe creativehuman resources that will be able to solveactualproblemsin real lifeandable to producenew technology for achieve the improvements than previous.

Education is the process of science so that the technology should be able to contribute to the educational process with a predetermined educational goals can be achieved. Therefore, to achieve the educational goals, the lecturer as an educator who should be responsible. A lecturer must have a strategy and appropriate learning models, especially in communicating with students and a lecturer must also have the ability to choose and use methods and media as a teaching aids. Lecturer as a teacher giving students the knowledge and skills as a facilitator, motivator and guide in achieving progress in learning (Slameto, 2003).

Physics is part of the Natural Sciences which is a process of discovery and not just mastery of a collection of knowledge in the form of facts, concepts, or principles (Mulyasa, 2010: 110), which can help students in gaining direct experience and

comprehension to develop the competencies. Physics as part of general education has an important role in improving the quality of education. Learning Physics also contribute to creating a qualified student, that is is capable in critical thinking, creative, logical and initiative in responding to the issue in the community caused by the impact of the development of science and technology (Sismanto, 2007).

Curriculum 2013 is actually a refinement of the previous curriculum that education unit level curriculum. Therefore, the general concept that exists in the curriculum in 2013 is actually not a new things. It means that the components that exist in the educational unit level curriculum is actually still present in the curriculum of 2013. The most important problem that really must be controlled by the faculty as a teacher is the ability to pack the present and learning strategies in accordance with the rules set by the curriculum in 2013 . in other words, the main principles of the most basic to the curriculum in 2013 is the emphasis on the ability of teachers to implement the learning process that authentic, challenging and meaningful to learners so that it can thrive potential learners in accordance with what is expected by the goals of national education.

According to the observations of Physics Education researchers and technological developments, the student must be provided with the ability to think logically, creatively and systematically. To be able to think logically, creatively and systematically is required a positive attitude. Particularly in physics learning, this aspect is developed in terms of scientific attitude, the attitude which will lead students to behave creatively and systematically. Aspects of attitude is the result of learning, in the sense that a person's attitude can be formed from the outside. This overview can be seen by the charge K13 is integrated into every aspect of the learning process.

Based on the issues above, faculty need to develop learning resources according to student characteristics. One of the efforts is to develop the StudentWorksheetwhich is used by the student in developing the concept (definition) and prove theorems and also may develop good attitudes of students.

Student Worksheet(SMEs) are identical from Student Worksheet(Worksheets) if used in schools. Student Worksheetis one form of a program based on the tasks and serve as a tool to transfer knowledge and skills (Depdiknas,, 2004). Wijiyanti (2008) states Worksheet is a learning tool that allows students to learn.

The purpose and benefits of working (SMEs) in order to activate students in the learning process, assist in developing the concept, practice and develop process skills, develop communication skills of social, emotional, moral, and aesthetic students develop intellectually and emotionally through the learning experience, and able to increase student mastery of concepts. Therefore, how the development of Worksheet in the course optics able to shape attitudes of students, resulting in Worksheet able to develop a scientific attitude values the student of physics that is valid, in accordance with the practical and effective implementation of the curriculum in 2013

Based on these descriptions, the authors are interested in conducting research entitled “The Implementation of Curriculum 2013 in Experement of Optic Course Through The Development of StudentWorksheetto Establish Scientific Attitude In Physics Education Program”

RESEARCH METHODS

The method used in this research is the Research and Development (R & D) is a process or steps to develop a new product, or improve existing products that can be justified.
Research design development using the model of R & D developed by Sukmadinata (2010), which consists of three stages: a preliminary study, product development, and product validation.
The measures undertaken in this study in accordance with the stages can be described as follows:

Preliminary Study Phase

At this stage, the analysis of the needs of the students towards the achievement of competencies and course materials optic based syllabus and SAP. Results of assessment requires the development of learning resources Worksheet. Selection of materials based on the material characteristics and difficulties of students in understanding the material provided lecturers and values students' scientific attitudes that can be developed through Worksheet. Optics course materials that meet these criteria and also consideration of the time of this study, the material chosen is a reflection and formation of shadows, shadow on Glass Establishment of Plan Parallel, a concave lens and a convex lens and light dispersion.

Product Development Phase

In this stage, the Worksheet is designed according to optical materials based on the guidelines preparation of Worksheet with good quality. Worksheet quality in terms of three aspects: 1) the subject matter (relevance, keiliahan, flexible, systematic, and follow the principles of effective learning); 2) the context of the pedagogic (prior knowledge, organizing materials, systematics dish, and the flow of grain; 3) the use of language is good and right.

The object that is developed in this study as follows:

Worksheet arranged adapted to the material that it includes objectives to be achieved, the measures will be done by the students in discovering concepts (definitions) and prove theorems and solving problems relating to definitions and theorems.

Research validity Instrument

Content validity assessment instruments used to determine the validity of the Worksheet.

Observation of Scientific attitude

Observation sheet is structured to observe the attitude of students that is appear during the learning process lasts. The scientific attitude that is can be developed through theWorksheet isHaving a curiosity, independent thinking, honest, working together in an open, discipline.

Learning Outcomes Test

Learning outcomes is used to determine the mastery of the material after use Worksheet.
Product Validation Phase

At this stage, the Worksheetvalidation (validation phase ISI) by three experts who have the potential paedagogik field, the field of physics and mathematics in assessing the Worksheetusing theWorksheet's assessment instrument validation. Based on the results of the validation by experts direvsi accordance with suggestions for improvement (phase improvement) in order to obtainWorksheetthat meet the criteria kevalidasian and feasible to use students in learning Worksheet that have been refined conducted product testing (validation phase II) to the students of Physics Education Study Program which follows the lecture Optics , Product trials conducted to test the practicality and effectiveness of the Worksheet.

The resulting product criteria that Worksheet are valid, practical and effective. The validity of Worksheetdetermined from the assessments from experts, the practicality of the products are observed through observation the practical ofWorksheet developed, while the effectiveness of the products obtained through the questionnaire responses of students, observation, scientific attitude of students for learning and achievement test

Data collected through assessment by the validator, and observation and tests student questionnaire responses were tabulated and then analyzed descriptively

Indicators of the success of this research is based on the score results of the validation criteria valid. Score the observation of the practicalities of the use of the Worksheet and educational attitude of at least the category of good and positive student response is at least 85% of students agree dna could not agree on the use of Worksheet in learning dna at least 85% of students achieve the learning outcomes with a score of 75.Tabel 1. Kriteria Penskoran Lembaran

Table 1 Observation and Validity Products

No	Score Average	Kategory	Validity Criteria
1	$1 \leq Va < 2$	Less	Less Valid
2	$2 \leq Va < 3$	Enough	Valid enough
3	$3 \leq Va < 4$	Good	Valid

(Adaptation From Hobri, 2010)

RESULT AND DICUSSION

Product that is required in Optic Course as Student Activity Sheets are used in learning to establish the scientific attitude of physics education student.

To know the validity, practicality and effectivity of the student activity sheets, researcher did the validity test by the expert and product trial to the physics education student espscially students who take the optic course using Worksheet1, Worksheet2, and Worksheet3.

Result of Validity Test

The result of each student activity Sheets shown in Table 2

Table 2. Result of Validity Test

No	Student Acitivity Sheets	Score	Validity
1	Student Acitivity Sheets 01	3,50	Valid
2	Student Acitivity Sheets 02	3,55	Valid
3	Student Acitivity Sheets03	3,60	Valid

In validity test of the worksheet in tble 2 shown that the developed product those were valued by the expert in each worksheet already fullfill the Valid category with score 3,50 for worksheet 01, 3,55 for worksheet 02 and 3,60 for worksheet 03.

This validity is needed to determine wether the worksheet that is provided already fulfill the good criteria. The worksheet based on the Depdiknas (2004) are to fulfill the didaktik requirments, contruction and tecnically requirements. The didaktik requirments are the worksheets must follow the state of effectiveness learning that is shown the differentiation of individual in order to findings concept process, have several media and able to develop the social communication, emocionally, and oesthetic.the contruction requirments are the requirements about the written form such as the languan, structure, and the difficulty level. Then, the techhnically requirments are about the for of worksheet and how using picture. The picture are used must be delver efficien message to the students. So that, this worksheet has valid due to this requirments during the learning process.

In other hand, this worksheet had been given some advice for its inprovements. The revision are related to the improvements in written the purpose of the worksheet and the proper material activity. So that, before the trial were done, this worksheet already fixed based on those advice from the expert.

Results of Worksheet Trial

The worksheet already trial to the physics education students in optics course. From this trial are get the efficiency the using of this worksheet, the observation of scientifics attitude, and also the results of students respons. The result of efficiency in learning process shon in Table 3.

TablE 3. Result of Efficiency the worksheet in optics course

No	Aspect	Score and Practicality		
		Worksheet 01	Worksheet02	Worksheet03
1	Clearness	3,20 (good)	3.25 (good)	3,30 (good)
2	Efficiency	3,25 (good)	3,30 (good)	3,25 (good)
3	Practicity	3.35 (good)	3.35 (good)	3,40 (good)
4	Properly	3.30 (good)	3.40 (good)	3.50 (good)
	Average	3,27 (good)	3,32 (good)	3,36 (good)

Based on the observation in tble 3 its already described that the use of the wprsheet in all aspects; clearness, efficiancy, Practicity and the appropiate get the lowets score 3.20 and high score 3.60 with good category. So that the usinh of those worksheets can stated already efficient enough in optic course learning process.

Those worksheet able to help stuudents understood the concept and with the easy language and clear instruction, time to finish the worksheet already fix due to learning objectives.

In workshhet 01 with reflection and the form of the shadows, the time was less for drawing so its more than 2 sessions. So that the lecturer have to guide and help the students in order to finish the worksheet in the right time.

Tabel 4. Results of the Students response into the using of the Worksheet

No	Student Acitivity Sheets	Students Respons (%)				Total
		Very Agree	Aggree	Less agree	Not agree	
1	Worksheet01	57	38	5	-	100%
2	Worksheet02	62	34	4	-	100%
3	Worksheet03	68	20	2	-	100%

SS = very agree S = agree
KS = less agree TS = not agree

In table 4 shown that the students response the average 100% stated that very agree and agree due to those worksheet (worksheet 01;a reflection and formation of shadows, worksheet 02 ;shadow on Glass Establishment of Plan Parallel, and worksheet 03;a concave lens and a convex lens and light dispersion) already effective and get a good response from the students.

In generally , due to the comments from students, they state that the using of this worksheet musch interst for the learning and give the motivate because the worksheet give them chance to discuss each other in ordr to master the concept. The astudents also can be interacted with each other not only between the students also with the lecture. Even In this activity there still students that were not actively did the worksheet. So that it is needed the observe the scientific attitude shown in table 5.

Table 5. Result of Scientific attitude after uisng the Worksheet

No	Attitude	Score and Category of Scientific Attitude		
		Worksheet01	Worksheet02	Worksheet03
1	Curiosity	65	70	75
2	Free Thinking	80	80	80
3	Honesty	65	65	65
4	Responsibility	80	85	80
5	Dicipline	85	85	85
	Average	75 (High)	77 (High)	77 (High)

The observation of educational scientific attitude of students in Table 5 illustrates that attitudes education students through the use of a worksheet in the high category. Thus the use of the worksheet on course to form an effective optical student attitudes fisika Education courses.
As for the attitude instilled in students through the learning using the worksheet is Having a curiosity, Thinking is free, honest, Cooperate and Discipline.

According to Harlen (in Irianti 2006), there are nine aspects of the scientific attitude, curiosity is an attitude that always want to get the right answer from the object

being studied, free thinking attitude is a scientific attitude which shall be to make students more creative. By thinking freely students better express the imagination of his mind in the process pembelajran, honest attitude uphold the truth, the attitude of working together is working together to gain more knowledge and attitude of discipline as a person's ability to control or regulate itself leads to behavior that can diteri others.

Value attitude can be inculcated in the students themselves when every student is able to define a definition or prove a theorem with a systematic, clear, and consistent. So as to obtain the correct conclusion on the worksheet. Applied learning by providing a lecturer on issues related to learning materials using a process ingintahu attitude will develop the habit in drawing a conclusion right on every issue that confronted the students.

Thinking values freely is a behavior that shows more creative students to work performed. The value of this attitude can be developed through learning by using the worksheet. Tasks that exist in the worksheet can be done student, so the thinking faculty see bebasi student behavior. If the value of this free thinking always trained in the habit of learning it will cause students to express their imagination in solving problems.

Work sheets Students can develop social communication in children (students) so that the required forms of activities that allow students to relate to others communicate their work to others (Depdikna, 2004). Use the worksheet in student learning is done by discussing with friends mengerjakannaya, although worksheet given individual. Student Worksheet done indirectly they will be argued in theorem proving and defining concepts. At this event happen each argued lecturers see and appreciate other people's opinions on them interact sesame even interact directly with faculty through debriefing. Thus, by using the worksheet in learning.

In learning, worksheets make student spirit and worked hard to learn. The spirit and work indicate optimimal behavior in the achievement of learning objectives. Worksheet can create enthusiasm for learning as worksheets give students the opportunity to discover and achieve learning objectives sendidri. Worksheet consists of sheets that contain activities that should be done by the students so that the students are challenged to solve the existing problems on the worksheet. Although students have reading resource book, but students can do it without thinking worksheet and discuss them.

Based on tests conducted to students after learning the results obtained using a worksheet that 43 of 50 students or as many as 86% of the students have mastered the material optics. Studentsmastery matter if the gain value at less than 75 (good).

In accordance with the student response, observation of attitudes and values student learning outcomes can be concluded that the worksheet developed qualify keeftifan or in other words the worksheet effective for use in learning. This is in line with the opinion of Maisarah and Sri Yanti agus Betty (2011) that the worksheet has a very big role in the learning process, because worksheet can help educators to steer students discover concepts through activities that occur. Besides, the worksheet can also develop process skills, enhancing the activity of learners so as to optimize the learning outcomes. Use the worksheet in the learning courses to facilitate student learning optics. The need Worksheet is used in Worksheet facilitate learning for students to interact with the material discussed.

The validity of the test result and Worksheet trials that have been done that show the validity, kepratisan and keefktifan then Worksheet can be said to have met the criteria as Worksheet valid, practical and effective. Worksheet product thus obtained can be expressed as the product is fit for use in pemebelajaran to develop a scientific attitude of students.

CONCLUSIONS AND SUGGESTIONS

Based on the research that has been done and in accordance with the objectives to be achieved, then found the following things;

The sheets work students developed practical declared by observation, because the use of Worksheet in learning has given the ease in the learning process, so that students can learn both

The student work developed Gazette declared effective, because students respond positively to penggunaanmya, can inculcate a scientific attitude of curiosity, responsibility, honesty and think freely, thus it can be concluded Worksheet developed a valid, practical and efektis used in learning for the formation of character Student Worksheet in order to obtain proper use in courses teaching optics.

Results of this study to obtain Worksheet that can form a scientific attitude of students through pembelajran, it can be used for faculty for learning in students who take courses optics. This character must be developed Worksheet for material optical instruments.

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