SCIENTIFIC LEARNING BASED ON OBJECT STUDY

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ABSTRACT

There is a new policy in Indonesia, namely curriculum 2013. Curriculum 2013 was designated for elementary , junior, and senior highschool . This policy was enacted in 2013. The policy of curriculum 2013 is an effort to rectify the shortcomings of education in Indonesia. The policy of curriculum 2013, is in line with previous policy of CBC (Competency Based Curriculum) . This curriculum is the embodiment of the CBC.Scientific learning is learning that : (1) . Based on the object / learning problems; (2) . There is a process during the learning; 3 . Learning outcomes are building /waking science; (4) . Achievement of learning : the methodological ability, conceptualization ability.

The concept of scientific learning : Find out *science*, method, object study. Role of teacher in scientific learning: organizer the object study, monitor, facilitator, evaluator. Approaches used in scientific learning: individual. group, classical. Object study is the end of study curriculu. The result of study curriculum : (1) stucturing the concept, (2) concept mapping, (3) essential concept, (4) material of concept, (5) object study.

Result of the research about Scientific learning based on object study: (1) Concept of science was found themselves, equals with competency social, science; (2) Ability of conceptualization, equals with competency social, science, skill ; (3) Ability of methodology, equals with competency social, science; (4) Ability of application, equals with science, skill; (5) Ability of giving the value, equals with spiritual, social. Scientific learning using media both by utilization and design can enrich the students' motivation.

Key words: *scientific learning, object study, media, competence.*

Introduction

There is a new policy in Indonesia, namely curriculum 2013. Curriculum 2013 was designated for elementary , junior, and senior highschool . This policy was enacted in 2013. It is expected, in

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2015 all classes in elementary , junior and senior high school in Indonesia will implement this curriculum. Ministry of Religious Affairs of the Republic of Indonesia has adopted this curriculum. The ministry of religious affairs will implements it in 2014. Since 2013, the training for teachers both the ministry of education and culture as well as ministry of religioous affairshas already done. The training is done in an effort so that the implementation of the curriculum in 2013 in accordance with the expected goals.

The policy of curriculum 2013 is an effort to rectify the shortcomings of education in Indonesia . One of the weakness of education in Indonesia is oriented cognitive aspects. Students have the knowledge but can not apply and provide value of what is learned. Previous curriculum based on the content of the material . Students learn the material and memorize the material provided by the teacher. Curriculum 2013 aims to enable students achieve competence spiritual, social , familiar to science , and is able to apply the knowledge (it is called Competence 1, 2, 3, and 3). In order to achieve these outcomes , namely C1 , C2,C3 , and C4 , the most important is the learning process.

The policy of curriculum 2013, is in line with previous policy of CBC (Competency Based Curriculum) . This curriculum is the embodiment of the CBC . Education in developed countries like UK and USA aims to develop science and technology . European countries , Japan , Malaysia , Thailand , education aims to improve the quality of human resources . Due to the purpose of education in Indonesia is improving the quality of human resources , it is in accordance with formulation competence into four (4) groups of competencies (C1 , 2,3 , and 4 mentioned above) .

The most important aspect in the implementation of the curriculum 2013 is the learning process. In the learning process , curriculum 2013 is implementing the strategy of scientific learning. Through scientific strategy , expected learning outcomes to achieve three (3) aspects of Bloom namely cognitive , affective , psychomotor. According to the ministry of education and culture , the term scientific learning means learn through observation, the students are in the central position and active in learning .

Education experts said that the study will provide meaning for students , if there is any learning process. There will be a process , when there is an object / learning problems . Through objects / problems, students will learn by doing. This one is form the principal of UNESCO 'learn to do'.[2] The authors examine the opinion above is the essence of scientific learning. Scientific learning is learning that :[3]

1 . Based on the object / learning problems .
2 . There is a process during the learning .
3 . Learning outcomes are building /waking science .

[2]Djohar.2008. Pengembangan Pendidikan Indonesia

[3]Djohar. 2007. Pembelajaran pada prodi Sain

4 . Achievement of learning : the methodological ability, conceptualization ability , understand concepts , ability to apply concepts / knowledge learned , capable of delivering value / value of the concepts learned .

The essence of the description above is scientific learning. The scientific learning concept is illustrated in Figure 1 below .[4]

Concept of Scientific Learning Based on Object Study

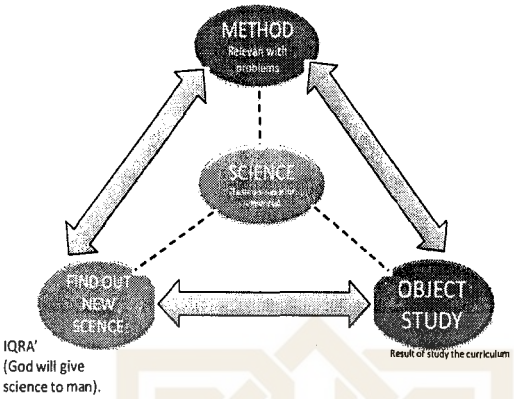
Scientific learning can occur when using the learning process of object / learning problems . Learning problems or object studies are the result of a review of the curriculum . The process of reviewing the curriculum can be seen in Figure 3 below . In the learning process, the students are interacting with objects / learning problems provided/prepared by the teacher . In solving the problem/ object/learning problems , teachers use learning/instructional methods in accordance with this quandary . In the learning process (students interact with objects / learning problems) will be acquired some proficiency in students namely : (1) methodological capabilities , (2) ability of conceptualization , (3) understand the concept , (4) the ability of the application , (5) ability provide value / value of the concepts learned .

Five abilities above can be analogous to competence 3 and 4 (Ministry of education and culture). Competence 3 is science, and competence 4 is application the science. How are the competence 1 and 2?. The learning process that uses a group approach would give meaning to the students that is the ability to socialize and live with others . The value in socializing is tolerance , empathy , respect to others and his works , and so forth . In order to achieve the core competencies 1 , the teacher must be able to integrate and connect the concepts learned from various scientific perspectives (religious sciences , natural sciences , and so forth) .

The concept of ' something ' that students obtained is not given or provided by the teacher . Students find a science concept through the process and they find it by themselves . The discovery of concepts/knowledge is called nuild a science or 'wake up science' . For higher education,finding science is a new science. But for low education , finding science is the students find the concept of science must not a new science. The student is not given by the teacher , but find themselves. If students find the concept of a science , it is in itself automatically wakes methodological ability , conceptualization , and understand the concept.[5]When strudents find out the science by themselves, the knowledge gained will embeded in students . Science that has been embeded in students an easy to apply and when students are able to deliver value from the knowledge that embeded in him .

[4] Djohar dimodifikasi oleh Istiningsih (2012)

[5] Djohar. Makalah Seminar di FMIPA UNY

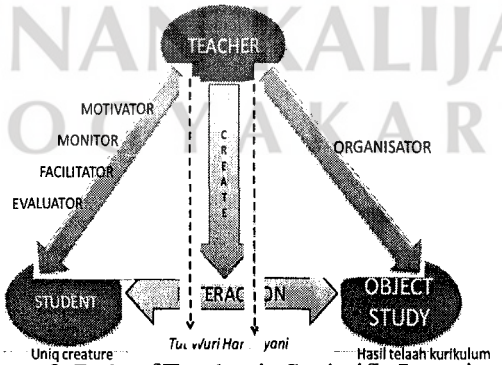


Picture 1 .Concept of Sceintific Learning (Djohar 2007)

Role of Teacher in Scientific Learning

The above description is more likely to talk about the position of the student in learning process . The question in this paper is ' How is the role of the teacher in scientific learning?'. The role of the teacher in the scientific learning process is : organizer , monitors , facilitators , evaluators .[6] The concept of the role of the teacher in the scientific learning illustrated in Figure 2 below .

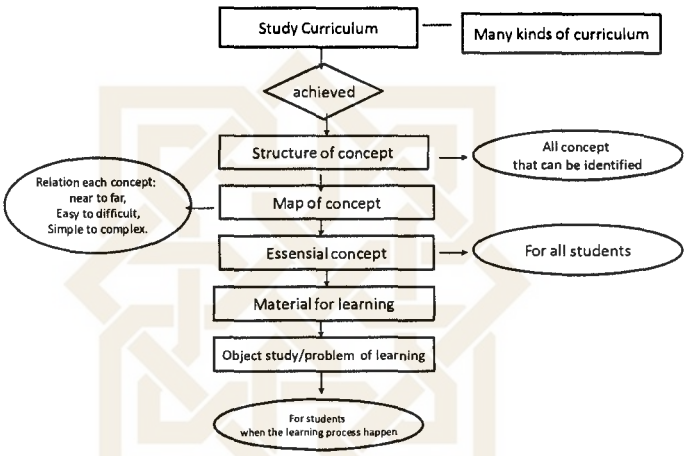
The role of the teacher as the organizer is to organize the object of study or learning problems . Object of study / learning problems are the result of the study curriculum . Before meeting with students in the classroom , teachers do lesson planning by designing the concept of the material / knowledge to be the object / problems to be addressed / worked on by students . In the learning process the teacher presents the object / learning problems . Monitors are monitoring student activity . The teacher circulates meet students one by one , observing the behavior and activities. During the monitoring , the teacher gives motivation to the students . The role of the facilitator is to help students to ease the problems faced by students . The role of the evaluator is an evaluation of each indicator competencies achieved by students . If students have not been able to reach every teacher competency indicators to facilitate student difficulties .



Picture 2 .Role of Teacher in Sceintific Learning

[6] Djohar. 2008. Pengembangan Pendidikan Indonesia

Teachers create the conditions to enable the student interaction with the object of study. The old paradigm considers that the learning process occurs when there is interaction between teachers and students. The new paradigm of looking at the real learning process is the interaction between Siwa with object / learning problems. Object / learning issues referred to in this article is something that is gained from the results of the study curriculum. Sequentially results of a study following curriculum in figure 4 below.

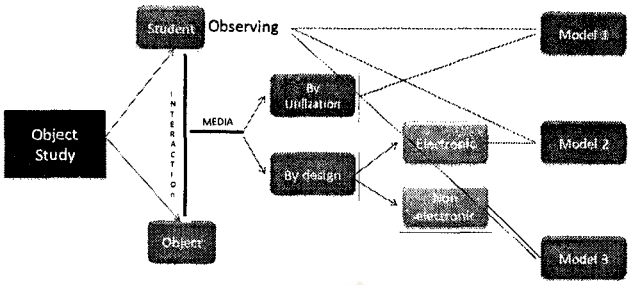


Picture 3 .Study Curriculum

Results of the study is to structure the curriculum concepts , map of concept, essential concepts , materials / teaching materials , and objects / problem learning . The structure concept is all concepts that can be identified . Examples of the concept of rain (on learning in primary schools) , in which there is the concept of water , clouds , evaporation , and so forth . Map of concept is a linkage between multiple concepts with other concepts . Essential concepts are all concepts that should be known to all students . Teaching materials is the science that that must be mastered by the student . Each of the knowledge presented by the teacher through the object / learning problems . Teachers prepare the object / learning problems . The learning problem.object study is presented the teacher in the learning process . Students complete the learning problem .

Implementation of Scientific Learning in Elementary School (Elementary School).

Study about scientific research has been done on the elementary school level (Madrasah Ibtidaiyah). Research paradigm is illustrated in Figure 4 .



Picture 4 .Research Paradigm 'Sceintific Learning'

This research is experimential research. In learning process of scientific learning based on object study, teacher also used media. There were 3 learning model: Model 1 using the media by utilization . Model 2 using electronic media . Model 3 using non- electronic media . Experiments conducted on the learning of science subjects for primary school students . The theme of study is life cycle . So the media (Media by utilization) ie, existing media , which can be directly used by the teacher (such as flowers , leaves , rocks , etc.) . Media design (media by design) that is , media that are designed by the teacher in accordance with the specific purpose of learning needs.

Results of studies using the learning objects presented through the medium of the three models as follows:[7]

Table 1.

The results of the learning outcomes using learning objects issue

No	Results – Achievement	Clasification of Competence
1	Concept of science was found themselves	C 2, C 3
2	Ability of conceptualization	C 2, C 3, C 4
3	Ability of methodology	C2, C 3
4	Ability of application	C 3, C 4
5	Ability of giving the value	C 1, C 2

Description: C1 Spiritual, divinity; C2 Social, C3 Sciences; C4 Skills

When we look deeper than what is happening in the student, then learning to use an object of study / learning issues which is supported by the media, then the results are as follows.

[7] Andi Prastowo & Istiningsih. Aplikasi Obyek studi Pada Pembelajaran IPA di MI. 2012

Table 2.

Results Learning Outcomes Using Learning Objects and Media

MODEL	LEARNING PROCESS	LEARNING OUTCOME
1 By Utilization	1. The desire to learn is high. 2. High attractiveness to students. 3. Students can do individual activities. 4. Students do more learning activities. 5. Class manageable. 6. Overcome the difficulties of students different backgrounds. 7. Helping language skills. 8. Laying the real basis for thinking 9. The result of study more embeded in students	C 1, C 2, C 3, C 4.
2 Electronic	1. Not verbalistic. 2. Overcoming the limitations of space, time. 3. Overcome the above difficulties students of different backgrounds. 4. Helping language skills. 5. Effective learning. 6. Learning efficient. 7. Laying the real basis for thinking. 8. Educate the student senses. 9. Generating motivation. 10. Reduce abstract things, be concrete so as to facilitate student learning. 11. The process is long - long can be shortened.	C 1, C 3, C 4
3 Non Electronic	1. Less desirable than model 2. 2. Less comprehensive than the message that should be informed. 3. Raises students' enthusiasm for learning. 4. Teachers need special skills for the provision of media. 5. Overcome the above difficulties students of different backgrounds. 6. Helping language skills.	C2, C3, C4

Conclusion

1. Meaning of scientific learning is the presence of objects / learning problems
2. Learning the true / real case, when the student interacts with the object / learning problems
3. Scientific learning is based on the object / learning problems, can produce knowledge. It can be said is waking science learning outcomes
4. Core scientific learning is a process
5. Through the process can establish themselves and build science
6. Object of the issue greatly affects the activity of student learning.
7. Object study issues affecting the achievement of learning outcomes.
8. The teacher's role is reduced to an object / learning problems.
9. Active and creative learning can be realized.
10. The use of object / learning issues and the media will be able to bring up the function of attention, affective, cognitive, and compensatory

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