ANALYSIS OF LEARNING AND INNOVATION SKILLS LEARNERS IN LEARNING ELEMENTARY SCHOOL BASED ON SCIENTIFIC APPROACH AS IMPLEMENTATION 21st CENTURY SKILLS

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Abstract: The objective of this study is to explain the learning and innovation skills of learners in following the process of learning in elementary school with a scientific approach as the implementation of 21st century skills. The method of this study was descriptive analytic research method with qualitative approach. The object of this study was teachers and primary school students who become the target of the implementation of Curriculum 2013 in Sukabumi City Education Office. The sampling technique using purposive sampling technique. The study time is done on the even semester of academic year 2017/2018 (January 2018 – May 2018). The data collection techniques were interviews with interview guide and observations with observation sheets. The data analysis techniques using descriptive analysis techniques. The results of this study showed that learning and inovation skills of learners in following the learning process in elementary school with scientific approach reached 76.60% with good category. Thus 21st century skills of learners should be further developed in each stage of scientific approach during the learning process.

Keywords: learning and inovation skills, scientific approach, 21st century skills

1. Introduction

Currently in the 21st Century at the same time entering the era of the ASEAN Economic Community (AEC) that must be faced by the Indonesian people. This requires attention from all sectors, especially the education sector which ranks first in the development of Indonesia's Human Resources. Education is increasingly important to ensure students have the skills to learn and innovate, skills to use technology and information media, and can work, and survive using life skills. Therefore, the implementation of the AEC is a good momentum to make improvements to the Indonesian education sector so that it can produce highly competitive human resources. Education is realized through a number of efforts called learning (Liliasari, 2012: 2).

Educational institutions have the role of teachers as professional educators who have a very important task in educating the life of the nation. Professional teachers must have four teacher competencies that have been defined in the law, namely the ability to master broad learning material, master the way to educate and teach (pedagogic), personality competence, and soasial competence. The teacher is obliged to carry out professional development continuously and proportionally as has been mandated in the Minister of Permennegpan-RB No. 16 of 2009. If the teacher can carry out his profession properly and objectively, then the government's aspiration to produce "people who are intelligent, comprehensive and competitive high "more quickly realized (Mendikbud, 2013: 82).

Educator's professionalism in the AEC era can be seen from the current condition of Indonesian human resources, the problems faced in the field of education in Indonesia, to the response of educational institutions in the face of a wave of change in the 21st Century. Therefore, the direction of education policy in Indonesia in the era of the AECgive an increase in the quality of human resources, especially the development of education as a national priority. The AEC era requires schools to have a strategic role as superior human resource providers. This role is to improve quality and socialization to students and parents of guardians about the impact of the implementation of the AEC so that they increase their competitiveness.

In fact, the achievement of Indonesian students in the field of science is still low. The 2012 PISA study shows that the dimensions of "scientific processes or skills, concepts and content, context or application" (OECD / PISA, 2012: 76) students in science are ranked "64th out of 65 countries" (OECD / PISA, 2014: 5). In addition, the TIMSS study in 2011 showed that the dimensions of "knowing, applying, and reasoning" (Martin et al., 2012: 119) students ranked "40th out of 42 countries" (TIMSS Team, 2011). The results of this study indicate that science learning is still at a low level with emphasis on learning on mastery of concepts.

The results of study of Clarke & Rowe (2007: 107-110) showed that science learning was not in accordance with the appropriate standards. Today the 21st Century is a globalization era marked by the rapid development of science and technology in various fields of people's lives. Therefore, a learning method is needed that can prepare students to achieve science and technology literacy, be able to think logically, critically, creatively and be able to argue correctly. This can be achieved with scientific approach based science learning that integrates learning and innovation skills to support 21st century skills.

2. Related Works/Literature Review

21st century skills explained by P21 Institute (2009: 6-7) include: (1) life and career skills, (2) learning and innovation skills, (3) critical thinking and problem solving, (4) communication and collaboration, and (5) information media and technology skills. These skills are summarized in a scheme called the rainbow of knowledge 21st century knowledge-skills rainbow (Trilling & Fadel, 2009) described in Figure 1.

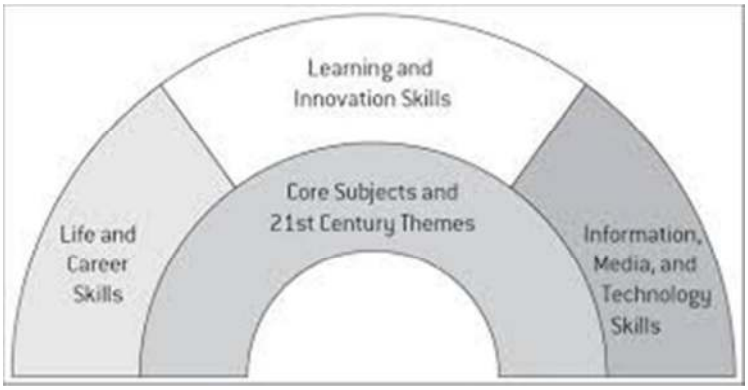

Figure 1. Rainbow 21st Century Knowledge Skills
Source: Trilling and Fadel (2009)

Skills of the 21st Century by Binkley et al (2012: 19-20) are divided into 4 groups consisting of (1) ways of thinking; (2) ways of working; (3) tools for working; (4) living in the world.

Learning and innovation skills include (1) critical thinking and problem solving (a person is able to use various reasons (reason) such as inductive or deductive for various situations; using system thinking; make decisions and solve problems), (2) communication and collaboration (someone is able to communicate clearly and collaborate with other group members), (3) creativity and innovation (someone is able to think creatively, work creatively and create new innovations).

The scientific approach used in learning is packaged sequentially: (1) observing, (2) questioning, (3) experimenting, (4) reasoning, and (5) networking. But the implementation can start from any stage, when students have reached an understanding of the innovation process coherently (Kuntari, 2013: 57). Mendikbud (2013: 213) describes the scientific approach in learning including observing, asking, trying, processing, presenting, concluding, and creating. According to Mc Collum (2009) explained that the important components in teaching using scientific approaches include the teacher must present learning that can foster a sense of wonder, encouraging observation, push for analysis, and require communication.

a. Method

This research method was carried out using descriptive analytic research method with a qualitative approach. The research procedure with this analytic descriptive method was carried out by conducting preliminary analysis and field analysis.

Preliminary analysis. This analysis is carried out on the results of preliminary studies, or secondary data, which will be used to determine the focus of the research. This preliminary analysis includes preliminary field analysis and literature analysis. The preliminary field analysis aims to collect data on primary schools that have implemented the 2013 curriculumand distribute questionnaire sheets to determine the implementation of the scientific approach to learning. The literature analysis aims to describe aspects in the learning and innovation skills of students.

Field analysis. Data analysis in qualitative research is carried out during data collection and after completion of data collection in a certain period. Field analysis to (1) reveal the difficulties faced by teachers in implementing learning with the scientific approach as the implementation of 21st Century Skills and (2) observe the implementation of scientific learning approaches and student activities (learning and innovation skills) in following the learning process based on the 2013 scientific approach curriculum.

3. Results and Discussion

a. Result

This study aims to uncover the implementation of the learning process with the scientific approach, mapping learning and innovation skills as the implementation of 21st century skills in the scientific approach, and the problem of the implementation of the scientific approach in the 2013 curriculum. In May, several schools included Cikole Elementary School, Cisaat Elementary School, Cimanggah 1 Elementary School, Dewi Sartika CBM Elementary School, and Cipanengah CBM

Elementary School with different grades. Based on observations of student learning activities in the learning process with the 2013 scientific curriculum approach that facilitates learning and innovation skills as 21st century skills can be described as follows.

Learning and innovation skills in this study are observed through student learning activities at each step of the scientific approach. Based on the results of observation and data analysis, the learning and innovation skills of students can be mapped as shown in Figure 2 below.

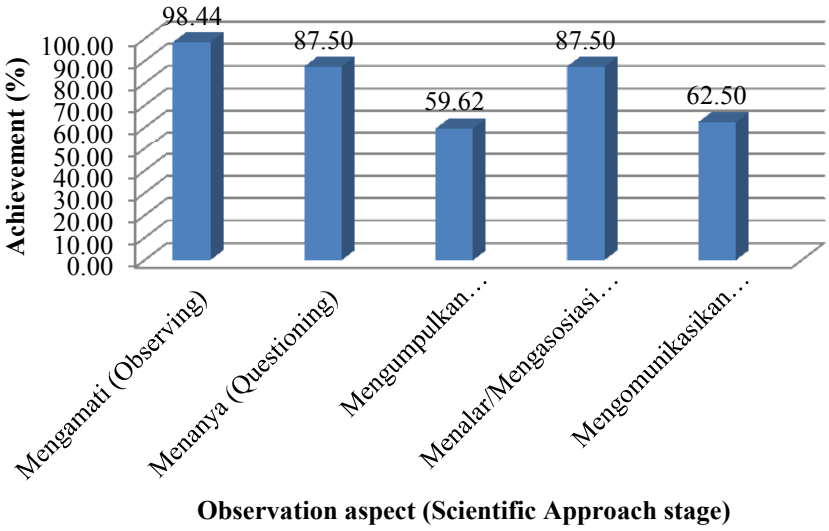

Figure 2. Diagram of Student Learning and Innovation Skills

The focus of observation in this study is on the scientific learning experience approach which consists of observing, questioning, experimenting, associating, and communicating.Overall learning and innovation skills of students achieved by all primary schools where observation is 76.60% with Good category.

b. Discussion

Based on Figure 2, the observing aspect has the highest achievement compared to other aspects. In the aspect of observing, student learning activities observed in participating in various activities include habituation to read, finding focus of observation, main ideas, messages, meaning of objects observed (natural phenomena, written texts, video shows, etc.), finding mistakes or problems in the object of observation, retelling the results of his observations, asking the point of view of the object being observed, accepting different points of view of the object of observation, responding positively to other students' different points of view, and giving escort questions to direct the students observe. All indicators on this observing aspect are achieved except the activity of giving students the opportunity to retell their observations. This is because the time required is insufficient, so the teacher goes on to the next learning activity.

Observing is the first step in the scientific approach undertaken by students to fulfill their curiosity, so that the process of pursuing has a high significance. By making observations, students discover the fact that there is a relationship between objects analyzed with learning material. In carrying out the process of observing a teacher gives students the opportunity to do activities openly such as; see, listen, hear and read. For example, when the teacher will teach learning with the theme of my activity, the students are invited to observe the picture, then they are invited to identify the characteristics that are in the picture and how the house is. By observing the picture, students will immediately be able to tell the conditions as required in Basic Competencies and indicators of learning, as well as any subject that can be combined with available media. In the presentation of learning, teachers and students need to understand what is to be recorded, through observation activities. Considering that students are still in elementary school level, observation will use more picture media, and contextual teaching (Majid, 2014: 215).

The second activity of the scientific approach step is to ask. The activity of the learning process is to ask questions about information that is not understood from what is observed or questions to get additional information about what is observed (starting from factual questions to hypothetical questions). Permendikbud (2013) explains that the competencies developed in the questioning activities are developing creativity, curiosity, the ability to formulate questions to form critical thoughts that are necessary for intelligent living and lifelong learning. Based on the results of the research question, there are still some obstacles, including: students are not used to asking procedural questions or hypotheses, students are embarrassed and not confident to ask questions.

Experimenting activities are carried out by digging information from various sources through various scientific methods such as reading more books, observing objects / events / activities of phenomena or objects that are more thorough, or even conducting experiments and interviews with resource persons. Examples of activities in gathering information are activities trying to obtain real and authentic study results in accordance with the data that has been obtained. Through this experiment students can develop knowledge about the surrounding environment, especially those related to the surrounding environment. The role of a teacher in this activity such as mentoring and mentoring. With this activity students are able to use scientific methods and be scientific in order to solve various problems in everyday life. Permendikbud (2013) explained that the competencies developed in the experimental activities develop meticulous, honest, polite, respect the opinions of others, the ability to communicate, apply the ability to collect information through various ways learned, develop learning habits and lifelong learning.

Associating activities are activities to process information that has been collected, both limited from the results of collecting / experimenting activities and the results of observing activities and information gathering activities. Processing of information collected from the nature adds depth and depth to information processing that is looking for solutions from various sources who have different opinions. Examples of reasoning activities that teachers do for example by giving pictures of student activities. This is intended to be more concrete. After that the students categorize the activities according to the location of the activity. the achievement of this indicator is 87.5%. All indicators are achieved by all schools, except indicators provide opportunities for students to choose important and needed information, facilitate students to use various data processing techniques, and facilitate students to present information / data in the form of tables or diagrams to facilitate reading information.

In the aspect of communicating, student learning activities observed in participating in various activities include presenting reports in the form of charts, tables, diagrams, and graphs so that it is easy to understand by other students, presenting written reports in Bahasa Indonesia that are good and true, presenting the process and results of collection and information processing with Indonesian language that is good and right, presents the excellence of the work he makes, displays the work neatly and is easy to reach other students, and demonstrates a certain procedure with flexibility and skill.

4. Conclusion

Mapping learning and innovation skills as an implementation of 21st century skills in the scientific approach obtained information that students' learning activities in observing reached 98.44%, questioning reached 87.50%, experimenting reached 59, 62%, associating reached 87.50%, and communicating reached 62.50%. On average, the overall learning and innovation skills of students in following the learning process in elementary schools with the scientific approach reached 76.60% with the Good category.

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