

## Teacher's Pedagogic Competence in Implementing the Scientific Approach in Learning Geography

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### Abstract

The main factors that determine the quality of education are teachers. The teacher is at the forefront of creating quality human resources. Indonesian education currently emphasizes the scientific approach. In essence, the approach scientific directs students to formulate problems. In addition, students are trained to think analytically, namely students are taught to make decisions, not just listen to and memorize subject matter only. Learning activities with the scientific approach will work well if the teacher understands what the scientific approach is. Teachers in geography learning must be able to guide students in carrying out the learning process with a good scientific approach. Geography learning is directed at inviting students to find out and act so as to help students gain a deeper understanding of the environment. Geography learning involves students in investigations with teacher guidance so students can build new knowledge or complete the knowledge they already have. the ability and knowledge of the teacher in utilizing and optimizing information on the scientific approach, both information through the internet, socialization, is influenced by several factors, namely education level, scientific background, teaching duration and burden, participation in training, mastery of methods and media, intensity of reading, and teacher's work ethic. These factors provide a significant influence on the teacher's understanding of the specific approach.

**Keywords:** teacher pedagogic competence, scientific approach

### Introduction

The existence of a teacher for a nation is very important. The teacher is the most influential component in creating quality education processes and outcomes. Professional teachers are teachers who have four competencies, namely pedagogical, personal, social, and professional competencies. As a geography teacher, you should have an understanding of geography learning itself. Starting from understanding the material, models, methods, approaches / strategies, and their application in learning activities. One of the policies in the 2013 curriculum is to apply the approach scientific to learning. According to Majid (2014, p. 211), "the scientific approach to learning is an approach that includes digging information through observation, asking questions, experimenting, then processing data or information, followed by analyzing, reasoning, concluding, and creating". This approach scientific is not new to be applied in the learning process. This research is expected to be a tool for the introduction of the 2013 Curriculum, which uses a scientific approach where students will be encouraged to have the ability to creativity, which is one aspect of high-level thinking. This creativity is developed through observing, questioning, associating, experimenting and networking. Noah (2013) stated that in Curriculum 2013, the competencies students need to be strengthened in three areas, namely the attitude, knowledge and skills as a result of education, which is where it all cannot be separated from the role of teachers as educators

### Methods

The method used in this research is the study literature. The data analyzed are the results of studies, books, and published journals. This study aims to describe the pedagogical competence of teachers in implementing the scientific approach to geography learning. The study of teacher

pedagogical competencies in implementing the scientific approach to geography learning is carried out with the following stages. That is tracking information sourced from print and electronic media and literature, do the analysis by describing and interpreting the data then making conclusions from the discussions that have been done.

### **Data Analysis Technique**

The purpose of this research is to find out and describe the pedagogical competence of the teacher in implementing the scientific approach in geography learning. Instruments are arranged based on the results of existing studies. After that, the analysis is carried out by sorting out the appropriate parameters, indicators and sub-indicators. The collected data was analyzed in order to draw conclusions well.

### **Result and Discussion**

Learning and student learning outcomes are largely determined by the role and competence of the teacher. Competent teachers will be better able to create an effective learning environment and be able to manage classes so that students are able to achieve maximum learning outcomes. The learning objectives achieved by students are one of the benchmarks of teacher competence. One of the competencies that must be possessed by the teacher is pedagogical competence, namely the ability to manage student learning including: 1) understanding of students, 2) designing and implementing learning, 3) evaluating learning outcomes and 4) developing students to actualize the various potentials they have, (National Education Standards clarification of Article 28 paragraph 3 item a). Mastery of the teacher's pedagogical competence will determine the level of success of the learning process and results of the students. This pedagogic competence is not obtained suddenly but through continuous and systematic learning efforts, both in the pre-service period (education of prospective teachers) and during positions supported by talents, interests and other teacher potentials of each individual concerned. Pedagogic competence is basically the quality of the teacher's ability to manage the process of teaching and learning activities, meaning that teacher's pedagogic competencies greatly determine the success of a learning that will affect the quality of educational outcomes, this is because the teacher interacts directly with students in the learning process in school. (Asrori, 2007: 1) states that one of the competencies that must be possessed by teachers as educators is pedagogic competence. Pedagogic competence implies that the teacher or educator as an agent of learning not only has the task and responsibility of transferring knowledge to the subject of his students but is able to educate to develop the overall potential of the students so that they become intelligent students and noble character. Rusman (2013: 54) said that pedagogical competencies include understanding of students, planning and implementation of learning activities, evaluating learning outcomes and development of students to actualize the various potentials of students. While. (E. Mulyasa, 2008: 77) expresses at least in pedagogical competencies there are eight abilities that must be possessed by a teacher, as follows:

- a) Understanding of Educational Insights and Platforms. Understanding of insights and educational foundation means the ability of a teacher to understand the learning material to be taught. A teacher is also required to teach learning methods that are appropriate to the scientific background so that the teacher has academic and intellectual expertise. A teacher must also have the knowledge and experience in teaching so that the learning material taught is not the wrong goal.
- b) Enforcement of students. A teacher cannot be separated from students, because the purpose of the learning outcome is the success and understanding of the students of the material being taught. A teacher is required to have an understanding of the developmental psychology of students, and to know the background of the personality in their students. in order to be able to make the right approach and understanding. Understanding of students means the ability of a teacher in understanding students.

- c) Development of curriculum and syllabus. Development of curriculum and syllabus is the ability of a teacher to develop both of these things. When a teacher can develop the curriculum and syllabus, the learning process can run and develop in a better direction. This ability requires a teacher to be creative and have goals that are far-oriented ahead. If the curriculum and syllabus can develop well then the results will be better.
- d) Learning Design. Before doing learning, a teacher should design learning that will be done in a strategic and mature manner, because design is halfway to success. Learning design means the ability of a teacher in designing learning activities that will be done. Good design will get better results too.
- e) Implementation of Educating and Dialogical Learning. The implementation of learning departs from a dialogical process between fellow learning subjects so that it can generate new thinking and communication. The implementation of this learning is expected to stimulate public awareness in facing turmoil in life. In this case the teacher creates a learning situation for children who are creative, active and fun. And the teacher provides space so that children can carry out their potential and abilities so they can be trained and developed.
- f) Use of Learning Technology. With the progress of the times, the emergence of new technologies that aim to help and facilitate a person in living his life. Likewise with learning technology, the easier it is for someone to get learning material. This requires that someone can take advantage of these technologies. Likewise with a teacher, the teacher is required to be able to use the technology to facilitate and streamline learning activities.
- g) Evaluation of Learning Outcomes. Evaluation of learning outcomes means the ability of a teacher to evaluate student learning outcomes. Evaluation of learning outcomes include the design, response of students, student learning outcomes, methods and approaches to learning. Evaluation of learning outcomes can be done by assessing tests, ability tests and final assessments. Teachers can carry out evaluation of learning outcomes after planning the right assessment, correct measurement and making conclusions and solutions appropriately.
- h) Development of students to actualize the various potentials they have, means the ability of a teacher to develop the potential possessed by students. Able to guide students, become a forum for students to recognize the potential that they have and train and develop this potential so that it can be actualized in life. A teacher can develop the potential of students by holding Extra-Curricular activities (EXKUL), enrichment, stabilization, remedial and guidance and counseling.

From some of these opinions and in accordance with Minister of Education Regulation No. 16 of 2007 concerning the standards of teacher qualifications and competencies, it can be concluded that the pedagogical competence of teachers is the ability of a teacher to understand students in depth and carry out their duties educatively. The pedagogic competence of the teacher who becomes the sub-focus consists of seven abilities, namely:

- a) Understanding of insights and educational foundation,
- b) Understanding of students,
- c) Learning design,
- d) Implementation of educational and dialogical learning,
- e) Utilization of learning technology,
- f) Evaluation of learning outcomes,
- g) Development of students to actualize the various potentials they have.

As a geography teacher, you should have an understanding of geography learning itself. Starting from understanding the material, models, methods, approaches / strategies, and their application in learning activities. One of the policies in the 2013 curriculum is to apply the approach scientific to learning. According to Majid (2014, p.211), "the scientific approach to learning is an approach that includes digging information through observation, asking questions, experimenting, then processing data or information, followed by analyzing, reasoning, concluding, and creating". This approach scientific is not new to be applied in the learning process. In essence, the approach scientific directs students to formulate problems. In addition, students are trained to think analytically, namely

students are taught to make decisions, not just listen to and memorize subject matter only. Learning activities using the scientific approach will work well if a teacher understands what the approach is scientific. Based on this background, the formulation of the problem in this study is "What is the teacher's understanding of the steps in the approach to scientific (scientific)geography learning?".

### Scientific Approach Learning

According to Sudarwan (2013), "the approach scientific has a prominent feature of the dimensions of observation, reasoning, discovery, validation, and explanation of a truth". The learning process must be carried out guided by scientific values, principles, or criteria. Thus, the learning process must be carried out guided by values, principles, or scientific criteria learning. Scientific is learning that makes science as a method or approach to the learning process so that learning will make learners more creative and more active. Putra (2013: 61-62) presents the characteristics of learning scientific: 1) Students are actively involved in activities based on science that reflect scientific methods and process skills that lead to discovery or guided inquiry; 2) Students need to be encouraged to carry out activities that involve finding answers to problems in the scientific and technological community; 3) Students need to be trained in learning by doing, then reflect on it. He must actively construct concepts, principles, and generalizations through scientific processes; 4) The teacher uses various approaches / learning models that vary in science learning; 5) Learners need to be helped to understand the limitations / limitations of science, values, and attitudes developed through science learning.

### Steps of the Scientific Approach

The learning process that refers to the scientific approach according to the Ministry of Education and Culture (2016) includes five steps, namely: observing, asking, collecting data, associating, and communicating. Next is explained as follows.

#### a) Observing

For example, student activities identify through the sense of sight (reading, listening), buff, listener, taster and feeler when observing an object with or without tools. Alternative observing activities include observation of the environment, observing images, videos, tables and graphs of data, analyzing maps, reading various information available on mass media and the internet and other sources. The form of learning outcomes from observing activities is that students can identify problems. Observing or observing is a viewing activity, paying close attention, then understanding the knowledge of an existing phenomenon. According Riduwan (2012, p. 30), "observation is to make observations directly to the object of research to see closely the activities carried out". Ministry of Education and Culture (2013, p. 212) formulates the steps of observing activities as follows:

- 1) Determine what objects will be observed;
- 2) Make observation guidelines according to the scope of the object to be observed;
- 3) Clearly determine what data needs to be observed, both primary and secondary;
- 4) Determine where the object will be observed;
- 5) Clearly determine how observations will be made to collect data to run easily and smoothly;
- 6) Determine how and record the results of observations, such as using notebooks, cameras, tape recorders, video recorders, and other stationery.

#### b) Asking

The question in learning is essentially asking and answering questions. Sa'ud (2011, p. 170) suggests "asking can be seen as a reflection of an individual's curiosity, while answering questions reflects a person's ability to think". When the teacher gives questions to students, at that time the teacher is guiding students to learn well. When the teacher answers the question, the teacher is encouraging students to become good listeners and learners.

The following are the functions and benefits obtained from the questioning activities:

- 1) Generating curiosity, interest, and attention of students about a theme or topic of learning;
- 2) Encourage and inspire students to actively learn, and develop questions from and for themselves;
- 3) Diagnose learners' learning difficulties as well as submit a plan to find a solution;
- 4) Structuring tasks and providing opportunities for students to demonstrate attitudes, skills, and understanding of the substance of learning given;
- 5) Generating skills of students in speaking, asking questions, and giving answers logically, systematically, and using good and correct language.

c) Reasoning

Reasoning in learning with a scientific approach illustrates that teachers and students are active actors. The pressure point is certainly in many ways and the situation of students must be more active than the teacher. Saminanto (2013, p.29) suggests that "reasoning is a logical and systematic process of thinking on observable empirical facts to obtain conclusions in the form of knowledge". Reasoning here is a thought process to obtain logical conclusions based on relevant facts. Reasoning ability is the ability to draw the right conclusions from existing evidence and according to certain rules. There are two ways of reasoning, namely inductive reasoning and deductive reasoning. Inductive reasoning is a way of reasoning by drawing conclusions from phenomena or special attributes for things that are general in nature. So, inductive reasoning is the process of drawing conclusions from cases that are real individually or specifically to be general conclusions. Deductive reasoning is a way of reasoning by drawing conclusions from statements or phenomena that are general to specific. Forming a Network in learning is meant by collaborative learning. Collaborative learning is a personal philosophy, more than just learning techniques in school classes. Collaboration is essentially an interaction philosophy and a human lifestyle that places and interprets cooperation as a well-designed and intentional interaction structure to facilitate collective effort in order to achieve a common goal. There are four characteristics of class or collaborative learning.

Two traits with regard to changes in the relationship between teachers and students. The third nature is related to the new approach of teacher delivery during the learning process. In the "2013 Curriculum Implementation Module" (2013, pp. 163-164) the four classes and collaborative learning are as follows:

- 1) Teachers and students share information;
- 2) Sharing tasks and authorities;
- 3) The teacher as a mediator;
- 4) Heterogeneous group of students.

d) Collecting data

Namely the activities of students looking for information as material to be analyzed and concluded. Activities to collect data can be done by reading books, collecting secondary data, field observations, trials (experiments), interviews, distributing questionnaires, and others. Learning outcomes from collecting data is that students can test hypotheses.

e) Associating

Namely student activities process data in the form of a series of physical and mental activities with the help of certain equipment. Forms of data processing activities include classifying, *sorting*, counting, dividing, and compiling data in a more informative form, and determining data sources so that they are more meaningful. Student activities in processing data for example creating tables, graphs, charts, maps, concepts, counting, and modeling. Furthermore students analyze data to compare or determine the relationship between data that has been processed with existing theories so that conclusions can be drawn and / or found principles and concepts significant meaning in adding cognitive schemes, expanding experience, cognitive schemes, broadening



experience, and insight into knowledge. The learning outcomes of reasoning / associating activities are that students can deduce the results of the study from the hypothesis.

f) Communicating

Namely the activities of students describe and convey their findings from observing, asking, collecting and processing data, and associating those aimed at other people both verbally and in writing in the form of diagrams, charts, images, and the like with the help of simple technological devices or information technology. and communication. The learning outcomes of communicating activities are that students can formulate and be responsible for proving hypotheses.

## Conclusion

From the above explanation, it can be concluded that Learning and student learning outcomes are largely determined by the role and competence of the teacher. Competent teachers will be better able to create an effective learning environment and be able to manage classes so that students are able to achieve maximum learning outcomes. The learning objectives achieved by students are one of the benchmarks of teacher competence. To obtain satisfying student learning outcomes, it is needed a teacher who is qualified or competent in managing learning well, therefore it is important that a teacher to master the teacher's pedagogical competence is absolutely necessary for professional teachers. Learning with a scientific approach is a learning process that is designed in such a way that students actively construct concepts, laws or principles through the stages of observing (to identify or find problems), formulate problems, submit or formulate hypotheses, collect data with various techniques, analyze data, draw conclusions and communicate.

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