



## TEACHER COMPETENCY IN IMPLEMENTING LEARNING BASED ON SCIENTIFIC APPROACH IN SMPN 1 & 2 KENDARI

### AUTHORS INFO

Tri Maniarta Sari  
Universitas Sembilanbelas November Kolaka  
[trimaniarta@gmail.com](mailto:trimaniarta@gmail.com)  
+6282293770906

Ernawati  
Universitas Sembilanbelas November Kolaka  
[ernaern3012@gmail.com](mailto:ernaern3012@gmail.com)  
+6285255328233

Asmawati Munir  
Universitas Halu Oleo  
[munir.asmawati16@gmail.com](mailto:munir.asmawati16@gmail.com)  
+6281341635358

Parakassi  
Universitas Halu Oleo  
[parakassi@gmail.com](mailto:parakassi@gmail.com)  
+6285210837777

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### Abstract

Curriculum 2013 teachers are required to perform a scientific study. So it's essential to see how the competence of teachers in learning based on a scientific approach. Based on this study aims to describe (1) the ability of science teachers in designing learning based on the scientific approach in SMPN 1 and SMPN 2 Kendari (2) the competence of science teachers in implementing the learning-based approach is scientifically appropriate curriculum, 2013 in SMPN 1 and SMPN 2 Kendari. The collection of data is done (This sentence appears to be written in the passive voice. Consider writing in the active voice) using an instrument study lesson plans, teaching observation, and interviews. The sampling using a purposive sampling method or sample aims. Samples are 13 teacher teaching science classes VII and VIII derived from two schools SMPN 1 and SMPN 2 Kendari. The results showed that (1) the competence of science teachers in designing learning based on appropriate scientific approach was in functional categories, (2) the ability of science teachers in implementing the learning based on proper scientific approach was good enough grade.

**Keyword:** Teachers Competence, Science Learning, Scientific Approach

### A. Introduction

Education is an investment in civilization for a nation. The quality of education can produce quality human resources. Therefore, the quality of education also reflects the progress of the nation. Until this decade, Indonesian people are still facing with the problem of the low quality of education. PISA (Program for International Student Assessment) proved in the results of

international scale research 2015 Indonesia occupied 10th place from the bottom with a score 386 out of 72 countries taking the test and in 2018 by placing Indonesia at number 74 of the total 79 countries tested. The 3-year research is intended to test the academic abilities of students aged 15-16 in the fields of mathematics, science, and reading (Setiawan, 2019; Komala & Qintani, 2017; Fadillah et al, 2019)

Above conditions made the government through the Ministry of Education and Culture (Kemendikbud) tried to make various policy breakthroughs to boost the quality of Indonesian education. One of the policies deemed relevant to improving quality is curriculum change. Changing the curriculum is necessary because the curriculum is a set of plans and arrangements regarding the content and subject matter as well as the methods used to guide the implementation of teaching and learning activities (Hamalik, 2001). In addition, the true curriculum must be able to adjust to the situation and challenges faced by the nation both internally and externally.

The regulation of Indonesian Minister of Education and Culture Number 81 A of 2013, 2013 Curriculum was officially implemented for primary and secondary education. Furthermore, in the Republic of Indonesia Minister of Education Regulation No. 65 the Year 2013, it is explained that the learning process in the 2013 Curriculum must use scientific approach. The essence of a scientific approach in learning refers to the view that knowledge is a scientific process (Siswanto et al, 2014; Sari, 2015)

The success of teachers in managing teaching and learning process does not escape from the competencies they have. One of the skills that must be possessed by teachers is competence as an agent of learning. As an agent of learning, the teacher has a role as a facilitator, motivator and inspirational learning for students (Mulyasa, 2007). One example is the teacher as a learning manager of MTs teachers. Hidayatul Muhtadi'in Malang is trying to create a learning climate that allows students to learn comfortably. Even with implementation 2013 curriculum, all teachers in MTs. Hidayatul Muhtadi'in working to directing the teaching and learning process increasingly better (Haq, 2018). It means that the success of students in the learning process is very dependent on teacher competence. Thus, as a form of contribution in the context of improving the quality of education, researchers deem it necessary to conduct research on "Science Teacher Competence in Implementing Learning Based on the Scientific Approach in SMP Negeri 1 & 2 Kendari"

## B. Literature Review

1. Marjan (2014) with the research title *"The Effect of Learning Scientific Approaches Against Biological Learning Outcomes and Science Process Skills of MA Mu'allimat NW Pancor Selong Students in East Lombok Regency of West Nusa Tenggara Barat"*.

The results showed that the Science Process Skills and learning outcomes of Biology students taught by a scientific approach were better than students taught by direct learning approach. Skills the science process has a close agreement by studying scientific because of learning experiences who asked what it was like which is on the skills indicator basic science processes namely regulation, classifying, communicating, measure, predict and end up. Essential factor becomes the basis, so it happens differently in science process skills between students who follow learning asks scientific with students who are supporting the model direct learning. That matter seen from each other's success indicator of science process skills the basis for learning scientific, high indicator entry while for the learning model directly into the category enough.

2. Mahzum (2014) with the research title *"Application of Scientific Learning Approach Method of Inquiry-Based Learning."*

The findings of this study are that the scientific learning approach to inquiry-based learning methods can improve students' understanding of concepts and skills. The increase in skill and understanding value is because students are more interested in learning with a scientific inquiry-based learning approach. Students in group discussions were very enthusiastic about being proven each student is active, willing to work with his colleagues, and always trying to find out about the topics they face.

## C. Methodology

1. *Research Design*

This research is qualitative. This research employs descriptive research method. Furthermore, to provide an assessment of the variables that discusses the results of the study of lesson plans and observations of learning. The rubric of evaluation uses 4 (four) categories. The

categories used to approve teacher competencies based on the Ministry of Education and Culture (2013) are as follows:

**Table 1.** Teacher Competency Categorization

No	Score	Category
1	$90 < AB \leq 100$	Very Good
2	$80 < B \leq 90$	Good
3	$70 < C \leq 80$	Enough
4	$\leq 70$	Less

## 2. Instruments

Data collection used the RPP study instruments, learning observations, and interviews. Teacher Competencies in learning needed used Lesson Plan (RPP). While to observe the teacher's competence in carrying out learning in class, the researcher used the learning lesson sheet. Indicators in the RPP assessment instruments are Authentic Assessment Design, Learning Media Selection, Learning Methods, Learning Scenarios, Subject Identity, Formulation of Indicators, Formulation of Learning Objectives, Selection of Teaching Materials. The indicators of the teaching and learning process assessment instrument (PBM) have three namely preliminary activities consisting of Apperception and Motivation, Competency Submission and Activity Plan. Next is the core activities consisting of Mastery of Learning Materials, Application of Scientific Approaches, Utilization of Learning Resources/ Media in Learning, Application of Educative Learning Strategies, Involving Students in Learning, Use of Language that is Right and Appropriate in Learning. And the last indicator is closing activities (Kemendikbud, 2013).

## 3. Technique of Data Analysis

Data collection in this research used documentation and observation techniques. Data collection procedure in this study was to study the lesson plan (RPP) made by the teacher before implementing the lesson. Study the RPP that is in line with the suitability of the RPP with the RPP model based on Permendikbud Number 81 A 2013 contained in it—observing learning in class using observation sheets. This stage, in order to get data on teacher competencies, the researcher used science learning based on scientific requests in the form of lesson plans. Interviewing the sample, the researcher used the questionnaire. The purpose of this stage was to see the challenges agreed upon by each teacher in carrying out a scientific gain.

The data obtained were analyzed with descriptive analysis techniques using the SPSS 17. The sampling method used a purposive sampling method. The research sample was natural science teachers in class VII and VIII coming from two schools, namely SMPN 1 and SMPN 2 Kendari, amounting to 13 people.

## D. Findings and Discussion

### 1. Findings

A summary of the results of the descriptive analysis using SPSS 17 can be seen in Table 2

**Table 2.** Summary of Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
RPP	13	80.00	97.77	89.2446	4.46981
PBM	13	65.00	85.00	76.5208	6.11765
Valid N (listwise)	13				

Based on descriptive analysis using SPSS 17, the mean (mean) of teacher competence in making lesson plans is 89.2 with a standard deviation (SD) of 4.5, as shown in Appendix 6. These results, when compared with the criteria, indicate that in general teacher competencies are in the category well. Besides, variations in standard deviations also obtained namely a comparison between standard deviations with an average of 0.05, which means that teacher competence in making lesson plans is homogeneous.

Based on the results of the descriptive analysis, the average or mean competency of teacher competence in implementing learning (PBM) is 76.5 with a standard deviation (SD) of 6.1. Thus, the average teacher competency in implementing PBM is in a sufficient category. Besides, variations in standard deviations are at 0.08 which means that teacher competence in implementing PBM is quite heterogeneous

**Table 3.** Frequency Distribution of RPP Study Result Scores

No	Range of Scores	Frequency	Very Good	Presentation (%)
1	90-100	8	Good	61,5
2	80-89	5	Enough	38,5
3	70-79	0	Less	0,0
4	<70	0	Very Good	0,0
Total				100

The distribution of data in Table 2 shows that the competence of teachers in developing lesson plans falls into two categories: good and excellent. In detail, it can be explained that from a total of 13 sample teachers, as many as eight people or 61.5% had a superb category lesson plan and the remaining five people or 38.5% had a superb category lesson plan

**Table 4.** Frequency Distribution of Learning Observation Results Scores

No	Range of Scores	Frequency	Category	Presentation (%)
1	90-100	2	Very Good	15,5
2	80-89	4	Good	30,8
3	70-79	6	Enough	46,2
4	<70	1	Less	7,7
Total				100

Table 3, data distribution frequency score of observations of learning in the table above, explains that the competence of teachers in the implementation of learning is in four categories namely the categories of less, enough, good, and very good. The breakdown of the percentage of achievements from 13 sample teachers is one person or 7.7% in the poor category, six people or 46.2% in the sufficient grade, four people or 30.8% in the excellent grade, and two people or 15.4% in the excellent category.

## 2. Discussion

In this study, the competencies seen are pedagogical competencies which are teacher competencies in preparing learning implementation plans and teacher competencies in implementing learning. The learning implementation plan is part of the teacher preparation phase before carrying out the teaching and learning process. According to Mulyasa (2003: 82) argues that the learning process that begins with the preparation phase of teaching will help teachers organize material and anticipate students and the problems that may arise in learning. For teachers to make useful and practical teaching preparations, they are required to understand various aspects related to the development of grade preparation, both related to the nature, functions, principles and procedures for developing teaching preparation (Majid, 2008: 96).

The results of the study of the sample teacher RPP conducted by experts concluded that the competence of science teachers in the 2013 curriculum piloting school in Kendari City was in the top category with an average score of 89.2. However, some components that still need to be improved include the formulation of indicators, the wording of learning objectives, the selection of learning resources, learning methods, learning scenarios, and authentic assessment designs. In the formulation of indicators, the researcher still found weaknesses that are the incompatibility of indicators with basic competence (KD) and the inconsistency of formulations with knowledge. Weaknesses in learning goals are the incompatibility of the wording of objectives with aspects of audience behaviour, condition, and degree. Weaknesses in the selection of learning resources are the mismatch of material objectives and the scientific approach. Furthermore, the researcher also found the mismatch of learning scenarios with the method whereas the authentic assessment component found a mismatch between forms, techniques, assessment instruments in the aspects of knowledge and skills.

Another indication of weaknesses found in this study is that although the lesson plans made by teachers were in a good category, based on the results of the interviews, most of the sample teachers did not understand the references and also learning models that were appropriate for the scientific approach. Some lesson plans made by teachers still adopted or adapted from lesson plans made by others, both from online media and examples of lesson plans used in curriculum training in 2013. they are exercising self-control by controlling self-confidence in students' mentality. This situation will arise in the condition of students who are familiar with the pressure or new circumstances that arise.

The basis for the preparation of the RPP is Government Regulation No. 19/2005 article 20 which reads: "Planning of the learning process includes a syllabus and learning implementation plan that contains at least learning objectives, teaching materials, learning methods, learning resources, and assessment of learning outcomes. Furthermore, Sulistyorini (2007) states that scenarios or science learning plans include initial activities, core activities, and final or closing activities. Concerning the design of learning based on a scientific approach, the components used as the object of study include: (1) the identity of the subject, (2) formulation of indicators, (3) formulation of learning objectives, (4) selection of teaching materials, (5) selection of learning resources, (6) selection of learning media, (7) learning methods, (8) learning scenarios, and (9) authentic assessment design.

The results of observations of learning with a scientific approach to the sample teachers conducted by researchers in collaboration with LPMP lecturers in Southeast Sulawesi Province concluded that the competence of natural science teachers in SMPN 1 Kendari and SMPN 2 Kendari in PBM was quite good. The data showed that the observations of teacher PBM competency has an average score of 76.1.

In the preliminary activities in the form of apperception and motivation, the majority of teachers succeeded in preparing students' physical and psychological conditions by saying greetings and inviting students to pray before starting learning. The teacher was also able to link the previous learning material with the present learning material. Besides, the teacher occasionally asked questions to challenge students to answer and do questions actively. Weaknesses found in the preliminary activities are that only a small percentage of teachers, namely around 30.8% of the total sample teachers, conveyed the benefits of learning materials to students. This condition needs attention because by communicating the benefits of the material to be learned, it is hoped that it will motivate students to be more diligent and severe in learning.

In the core activities, in terms of mastery of subject matter, the majority of teachers already have a good mastery of the material. The teacher is able to present the discussion of learning material appropriately and systematically. However, teachers still find it difficult to link material with other knowledge relevant to the development of science and technology and real life. This can be seen from the percentage of teachers who did these items only around 30.8% of the total sample teacher.

In the aspect of applying educational learning strategies, the majority of teachers have also been able to do well. Weaknesses found in this aspect are the items implementing learning that allows the growth of positive habits effect, which can only be done by about 23.1% of sample teachers. In this aspect, the teacher does not try to encourage students to be more responsible and cause gratitude towards God's power-related with material that has been studied.

Furthermore, the application of the scientific approach was found that most teachers were able to facilitate students to observe, try, analyze, and communicate. Items that have not been able to be done by teachers on aspects of applying a scientific approach are facilitating students to the reason (think systematically and logically). As a percentage, the sample teachers who were able to carry out these activities were only 1% of the total sample teachers. It is correlated with the results of interviews with teachers who are primarily unable to explain the application form of the scientific approach, especially in the aspects of associating.

The use of learning resources and learning media showed that the majority of teachers can do well. Likewise, with the use of standard language in learning, teachers do not experience obstacles. While in the aspect of involving students in learning, it was found that most of the teachers did not show a conducive interpersonal relationship. It can be seen from the lack of teacher activity in the form of greeting and or communicating with students during the PBM process.

In the closing activity, it was found that the majority of teachers reflected or made a summary of the learning outcomes by involving students. Besides that, it also carries out follow-up activities by giving directions and giving assignments for enrichment and homework. What the teacher could not do optimally was the provision of oral or written tests with the percentage of teachers carrying out 30.8%. Likewise, the items collecting work as portfolio material were only carried out by 46.8% of the total sample teacher.

## **E. Conclusion**

Based on the results of data analysis and discussion, the conclusions obtained in this study are the Competence of Science teachers in preparing Learning Implementation Plans (RPP) in

the outstanding category and the Competence of Science teachers in implementing learning (PBM) based on the scientific approach is in the good enough grade,

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