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SCIENCE TEACHERS` COMPETENCE IN UTILIZE LEARNING RESOURCES AT JUNIOR HIGH SCHOOLS

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Abstract

This study aimed to determine: (1) learning resources used by science teachers, (2) the ability of science teachers to utilize learning resources, and (3) the implications of using learning resources on the quality of science teachers in the learning process. This study was a field study with a qualitative approach. The subjects of this study was science teachers at SMP N 3 Purworejo. Techniques used in data analysis was an interactive model by Miles & Huberman including data collection, data reduction, data display, and conclusion. The result showed that learning resources used by science teachers include in the environment around the school, the environment around the residence of learners, and learning outside of school. The ability of science teachers to utilize learning resources, overall all science teachers of SMP Negeri 3 Purworejo was able to use it. Implications use of learning resources on the quality of science teachers in learning process was teacher able to give more motivation, maximize learning time, and maximize creativity.

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INTRODUCTION

Learning is a complex process that happens to everyone along his life. The learning process occurs because of the interaction between someone and the environment as a learning resources that is effective so that the learning outcomes obtained are maximal. Avalos (2011) provides an explanation that learning is an activity both with the guidance of teaching staff or teachers and with their own efforts. For students, learning is basically to get knowledge, skills, and attitudes anywhere, anytime, and with anything through learning resources that are obtained anywhere and in various types. The quality of student interaction with learning resources is very influential on learning outcomes.

Ljubojevic, et al (2014) state that learning resources are all sources including messages, people, materials, tools, techniques, and backgrounds that can be used by students either individually or in a combined form to facilitate learning activities and improve learning performance. In line with these opinions, Seels and Richey (1994: 11-12) state that learning resources is all supporting sources for learning activities including support systems and materials used in learning. So, learning resources can include what is available to help someone learn effectively. Teachers` presence in learning activities is intended to utilize learning resources so that students can learn more smoothly, easily, pleasantly, and effectively.

The use of learning resources by teachers is one of the determining factors for effective learning in schools in addition to teaching materials, learning media, learning methods, and learning environments. Learning strategies and approaches are no longer teacher-oriented but are oriented towards students as subjects (student centered). Teachers are not the only learning resources, learning can still be carried out without the teacher because there are other learning resources. So that, the teacher must have competence that is able to take advantage of other learning resources in learning and not only use existing learning resources in the classroom, but must be able and willing to find a variety of learning resources that are appropriately to the subject matter.

Based on UU No. 14 of 2005 Article 1 about teachers and lecturers, states that: "Teachers are professional educators with the main task of educating, teaching, guiding, directing, training, and evaluating students in early childhood for formal, basic, and intermediate." So, the ability of the teachers besides being mentioned in the Law, the teacher must be able to (1) know the communication process in the learning process, (2) know the nature of each learning source, both physically and characteristically caused by other factors, and (3) the teacher knows where the source is and how to use it. This ability is intended to illustrate that teachers need to be aware of the importance of special abilities developed when they want an optimal learning process.

Teachers have an important role in education especially in formal education. The teacher determines the success of education through the learning process. In fact, teachers are seen as the most influential component in the creation of quality educational processes and outcomes (Khotijah, 2013: 91). Given the importance of the role of teachers in improving human resources, teachers are required to always improve the quality of their competence so that they are truly capable as professional teachers.

Learning resources that can be utilized by teachers for learning needs are very diverse in type and form. The learning resources are not only in the form of printed materials such as textbooks provided by the government, but teachers can take advantage of other learning resources such as: educational radio, television, computers, interactive videos, multimedia computer technology, libraries, laboratories, and museums. Bustari (2005: 48) states that learning resources in junior high schools are very limited in availability, and have not been well managed and have not been used optimally in the teaching and learning process. This has an impact on learning that is less meaningful, not interesting, and results in students having less than optimal learning outcomes.

Learning now uses Curriculum 2013, which requires the learning process in the education unit to be held interactively, inspiring, fun, challenging, and motivating students to actively participate. Teacher competence in utilizing learning resources is needed in an effort to broaden the horizons of science, attitudes, and skills of students in learning activities so that learning becomes more effective and efficient and has an impact on student learning outcomes that increase. The curriculum and teacher competence together influence student learning achievement (Lucenario et al, 2016). The results of further testing partially show that only teacher competence has a very significant role in student

learning achievement, while the curriculum has no effect (Sappaile, 2017). This shows that teacher competence plays a very important role in improving student learning achievement (Celik, S, 2011).

Teacher competency in utilizing learning resources can be done in science lessons. Sapiudin (2014) states that science plays an important role in advancing human life in the development of a civilization. The progress of knowledge and technology as in the present era, is also inseparable from science. In addition, science subjects contribute greatly to the progress of a nation, because it is proven that the material welfare of a nation depends a lot on the progress of the nation in the field of science, so it can be said that science is the basis of technology for a nation.

The science and technology subject groups in SMP/MTs are intended to obtain basic competencies in science and technology and to cultivate scientific thinking critically, creatively and independently (BNSP, 2006: 150). Therefore, science education has the duty to prepare qualified students who are able to think logically, critically, and creatively and take the initiative in responding to issues of science and technology development in society. Based on this, science subjects are very important role, so the teacher must be able to provide science learning material effectively to students. One way that science teachers can do is to utilize learning resources.

Utilization of learning resources conducted by science teachers in schools, can facilitate students in understanding science materials and facilitate science teachers when explaining science subject matter. Kivunja (2014) explained that science learning that should be done is learning that can prepare students to be knowledgeable in science and technology, able to think logically, be able to think critically, creatively, and solve problems in real life. Based on some of these explanations it can be implied that the goal of learning science in addition to creating students with scientific literacy, is also able to create students who have the ability to think creatively.

Fathurohman (2014) explained that students scientific literacy abilities can be influenced by several factors, namely learning methods and models by the teacher, education curriculum and system, learning facilities and infrastructure, learning resources, and teaching materials. Of these factors, one of the factors that influence the ability of science learning by students is learning resources. Learning resources commonly used by teachers are lesson textbooks and student worksheets that are available at school. So that causes science learning to be less interesting and monotonous. Therefore, the competency of science teachers is needed in utilizing learning resources in the school environment as well as outside the school, so students can actively participate in learning.

Benjamin & Orodho (2014) said that to ensure that learning resources are suitable for use in learning, it must meet the requirements. *First*, learning resources must be able to provide strength in the teaching and learning process so that instructional goals can be achieved optimally. *Second*, learning resources must have deductive instructional values, which can change and bring about perfect changes to behavior in accordance with existing goals. *Third*, learning resources must be available quickly, must enable students to stimulate themselves and be individualized by fulfilling various needs through independent learning.

The role of science teachers in choosing learning resources is very influential in the learning process both in the classroom (indoor) and outside the classroom (outdoor). Learning resources needed in learning activities are listed in the planning or learning program. The teacher must analyze the learning resource requirements based on learning material and learning objectives. In this case, science teachers must have the knowledge and competence to identify types, choose, and determine appropriate learning resources and use learning resources in science learning activities. It should be noted, that the normative and juridical demands imposed on teachers have not all been in accordance with the conditions of the teaching staff or teachers. Academic qualifications and teacher competence are far from national education standards. In addition, the teacher's mastery of the subject matter taught to students is also still weak.

Hairani (2016) states that science process skills have also not been given in science learning because the science learning process is still teacher-centered. Some teachers stated that in carrying out the experimental activities usually only the teacher demonstrated and the students did not do it themselves. The competence of science teachers in utilizing learning resources such as laboratories and museums is still rarely done, which of course can have an effect on student learning outcomes.

From several conditions and problems that occur regarding teacher competencies, especially science teachers in utilizing learning resources, a

study was conducted at SMP N 3 Purworejo. This study aims to determine the learning resources utilize by science teachers in SMP N 3 Purworejo, science teachers competence to utilize learning resources in SMP N 3 Purworejo, and the implications of using learning resources on the quality of science teachers in the learning process.

METHODS

This study uses a qualitative approach and field research. The qualitative approach is directed at the background and the individual as a whole and has research procedures that produce descriptive data (Moleong, 2011: 6). Nazir (2005: 65) argues that field research is a study conducted by visiting the place that is the object of research. This research was conducted on October 4, 2018 as a pre-survey and the study continued until December 12, 2018. The place of this study was in SMP N 3 Purworejo.

The research subjects were science teachers and principals in SMP N 3 Purworejo. The research subjects is based on observations before the study, then after being examined closely the teachers who use the learning resources most often in school are science teachers. While the principal, is used to obtain data on the availability of learning resources and science teachers competence in schools.

The procedure of this research was carried out in several stages including: (1) preparation of proposals, (2) licensing, (3) data collection, (4) data analysis, and (5) preparation of research reports. In this study, the data obtained are descriptions in the form of words and languages in a specific natural context and by utilizing various natural methods. Data collected using instruments are observation guidelines, interview guidelines, and documentation guidelines.

Observation guidelines are used to obtain competency data for science teachers in utilizing learning resources and regarding the implications of using learning resources on the quality of science teachers. Interview guidelines are used to obtain data on learning resources that are utilized during learning, on the competence of science teachers in utilizing learning resources, and on the implications of using learning resources on the quality of science teachers. Documentation guidelines are used to obtain learning resource data used by science teachers in learning at school.

Techniques used in data analysis was an interactive model by Miles & Huberman in Herdiansyah (2010: 163) which includes: (1) data collection, (2) data reduction, (3) data display, and (4) conclusion.

RESULTS AND DISCUSSION

The results of this qualitative study are as follows:

Learning resources used by science teachers at SMP N 3 Purworejo

Commonly the types of learning resources that tend to be used in educational units according to Stronge (2006: 103) there are six types: (1) people, such as teaching staff or teachers, (2) places or backgrounds, such as libraries and laboratories, (3) techniques , in the form of lectures, discussions, participatory learning, individual learning, group learning, simulations, field studies, answers, and assignments, (4) tools, in the form of laboratory, (5) messages, such as ideas, facts, meanings related to the eyes lessons, and (6) materials, in the form of books, clippings, blackboards, maps, globe, images, computers, radio, television, OHP, and cameras. The learning resources used by science teachers at SMP N 3 Purworejo are as follows:

1. School environment

Based on data from observations and interviews, learning resources available at SMP N 3 Purworejo used in science learning are textbooks, student worksheets, student clippings, laboratories, the internet, and libraries. Utilization of learning resources by science teachers in SMP N 3 Purworejo: (1) utilizing textbooks to support teaching and learning activities carried out by science teachers and provide motivation for student participants, (2) utilizing student worksheets to provide knowledge to students, measuring students' understanding of the material taught by the teacher, and developing and applying subject matter that is difficult to convey verbally, (3) utilizing kliping to save and preserve human intellectual property, disseminate ideas to others, create creativity of students, (4) utilizing laboratories to expand knowledge by practicing directly so that the subject matter learned by students becomes clear and easy, and (5) the library is utilized if students experience difficulties, the teacher gives freedom to students to look for additional sources in the school library.

2. The environment around the residence of students

Based on observational data on learning resources that are used by science teachers in each lesson both in grades VII, VIII, and IX, that teachers use learning resources in the environment around the place of residence of students. In the learning process the environment around the residence of students is used by science teachers when giving examples and giving homework.

This can be seen in the process of learning science in class VII, which previously the teacher gave the task to observe and write the results of reports regarding changes in solid and liquid objects through experiments conducted around the residence of students. Then the teacher tells some students to share their observations with other students. This observation data is supported by the results of the recognition of some class VII students who say that the teacher with the initials F, often giving assignments using learning resources that exist in the environment around the place of residence of students and then writing the results in a notebook.

This is also reinforced by the documentation study in the form of RPP (Learning Implementation Plan) in science learning in writing that the lesson on changes in solid and liquid objects is true and the teacher does not write directly the learning resources used for the lesson. This means that the teacher is able to take advantage of other learning resources other than those available at school or those listed in the lesson plan by utilizing learning resources around the students (Saadah, et al. 2017).

3. Environment outside of school

Learning outside of school is an activity carried out by class VIII students from schools that take place every year. Utilizing the outside school environment as a learning resource besides aiming to increase students' knowledge can also provide a different learning atmosphere to students because they can learn directly (Savitri, et al. 2017). Based on data from interviews with principals on the learning resources used by science teachers for class VIII, which is closely related to science learning, it was found that teachers used learning resources by visiting the Biology Museum in Yogyakarta.

Students are invited to learn to know directly about the various flora and fauna that exist in Indonesia through the Biology Museum. By utilizing learning resources outside of school, students can learn and see directly, making it easier for teachers, especially science teachers to explain the lesson. This fact is also supported by documentation study data from school activity plan documents that are written that every year in semester 2 there are learning activities outside of school. This activity is carried out every year with different places based on the needs of the teacher in supporting their learning.

Science teachers` competence in utilize learning resources at SMP N 3 Purworejo

1. Science teacher in class VII

Based on the results of observations, it was found that the science learning process in class VII had already used the Curriculum 2013. The competency of science teachers in utilizing learning resources in learning in class VII has been seen. This can be seen when the teacher gives the task to observe and write the results of the report regarding changes in solid and liquid objects through an experiment conducted around the residence of each student. Then the teacher tells some students to share their observations with other students.

The observation data was supported by recognition from other teachers who said that science teachers were in class VII even though during learning more often used textbooks and worksheets, but occasionally the teacher gave the task to observe or conduct experiments in the environment around the students. In addition, based on the recognition of class VII students, the teacher when giving science lessons always gives homework in the form of observations and experiments around the environment where students live.

2. Science teacher in class VIII

Based on the results of observations and interviews with the principal, it was found data that the teacher's ability to utilize learning resources in science learning in class VIII by inviting students to visit the Biology Museum in Yogyakarta. The visit activity is a program held by the school every year. The activity is not just just visiting the museum, students are guided by tour guides and teachers who provide explanations of the contents of each corner of the museum regarding various flora and fauna in Indonesia. After completing being invited to tour the museum, teachers and students then make a simple review of the results of traveling around the Biology Museum in Yogyakarta.

The results of the observations and interviews were supported by the recognition of other teachers who accompanied the visit to the museum, who said that the science teacher for class VIII after the students had finished going

around then all the science teachers gathered students to ask questions about what had been known to students in the museum. In addition, on the week after the visit to the museum on science lessons, the teacher gave the opportunity for students to share the results of their visits and observations to the Biology Museum in Yogyakarta, which then continued with the teacher giving further responses and explanations to the students.

3. Science teacher in class IX

Based on the results of observations, it was found that the competence of science teachers was quite capable in utilizing learning resources during learning for class IX. When giving science lessons, the teacher uses the main reference by utilizing the Curriculum 2013 textbook, but it is not uncommon for students to be invited to the school yard to learn firsthand the material being studied. As in learning plants including monocots and dicots, students are told to look for various types of plants on the school grounds. After that, the teacher goes around seeing some students who have found the plants and asked some questions related to the lesson. This is evidence that teachers not only use textbooks but also other learning resources by utilizing various plants on the school grounds. Then, based on the recognition of students when teaching, the teacher is very pleasant and clear when delivering lessons and when giving examples always use something that is in the environment.

In addition, the science teachers` competence in class VII, VIII, and IX was also proven from several aspects which obtained very good criteria in utilizing learning resources. The following is a table of science teachers` competence based on several aspects, that is:

Table 1. Science Teachers` Competence in Utilize Learning Resources in Class VII, Class VIII, & Class IX

No.	Aspect	Average Score	Criteria
1.	Competence to manage learning	14.99	Very good
2.	Competence to design and implement learning	7.66	Very good
3.	Development skills of students	8.00	Very good
4.	Personality Competence	11.33	Very good
5.	Mastery Competence and Understanding of Material	8.00	Very good
6.	Competence to Manage Learning Processes and Manage Classes	13.99	Good
7.	Communication and Cooperation Competence	10.99	Very good

Implications of the use of learning resources on the quality of science teachers at SMP N 3 Purworejo

One of the success factors of learning designed by teachers in lesson plans is that the teacher has the competence to use learning resources. With the competency of science teachers in utilizing learning resources in learning can increase students' learning motivation. Although the availability of learning resources in SMP N 3 Purworejo is fairly simple, the quality of learning is not inferior to other schools that have more available learning resources. The following are the implications of using learning resources on the quality of science teachers in learning.

1. Teachers become more able to provide motivation to students because they don't only use textbooks and lecture methods in learning.
2. Teachers become more able to maximize limited learning time by utilizing learning resources that are in accordance with the needs of science subject matter.
3. Teachers become more able to maximize creativity in combining learning resources.

CONCLUSION

Based on the description of the results of the research and the discussions that have been conducted, the conclusions are as follows:

1. Learning resources used by science teachers at SMP N 3 Purworejo include in the environment around the school, the environment around the residence of learners, and learning outside of school.
2. Science teachers` competence in utilizing learning resources at SMP N 3 Purworejo, as a whole, is able to utilize learning resources according to their respective skills and be able to combine learning resources to be more varied so that learning becomes more effective. In lesson plans, variations in learning resources are accordance with the implementation of science learning.

3. The implications of using learning resources on the quality of science teachers in the learning process are as follows:
   a. Teachers become more able to provide motivation to students because they don't only use textbooks and lecture methods in learning.
   b. Teachers become more able to maximize limited learning time by utilizing learning resources that are in accordance with the needs of science subject matter.
   c. Teachers become more able to maximize creativity in combining learning resources.

RECOMMENDATION

After the researchers conducted a study of the competencies of science teachers in utilize learning resources at SMP N 3 Purworejo. There are limitations to the research: (1) learning resources at school are still simple, especially those available in the classroom, and (2) teachers are still not fluent in utilizing learning resources related to technology, but understanding of learning resources is more than enough. Then some recommendations are proposed as follows:

1. Theoretical recommendations

Learning resources as a component in the teaching and learning process have great benefits, so that by incorporating planned learning resources, a teaching and learning activity will be more effective and efficient in the effort to achieve the set instructional goals. The implementation of the use of learning resources in the learning process has been listed in the Curriculum 2013 which states that effective learning processes are learning processes that utilize a variety of learning resources.

2. Practical recommendations
   a. It is better if the parties related to the improvement of teacher competencies such as P4TK (Center for Development and Empowerment of Educators and Education Personnel) pay more attention to the things teachers need to include teacher knowledge in an effort to use more optimal learning resources, by providing intensive training on the use of learning resources in school.
   b. The implementation of learning in particular science learning in utilizing learning resources should be maximized so that the school's mission and vision can be achieved more optimally.

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