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THE INFLUENCE OF GUIDED DISCOVERY LEARNING TROUGH HANDS ON ACTIVITY AND PICTURES MEDIA TOWARD THE CONCEPT UNDERSTANDING OF FUNGI VIEWED OF STUDENTS SCIENCE LEARNING MOTIVATION

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Abstract
The low level of concept understanding of fungi, we need an appropriate learning model to overcome them. This research is aimed to determine the effect of *guided discovery learning* with *hands on activity* toward the concept understanding of fungi,with moderator variable is science learning motivation. The subject of this study are students of X IPA in SMAN 1 Bojonggede totalling 124 students on Januari–Maret 2018. The research method used quasi experiment with 2 x 2 factorial design model. The instruments used were tests of science learning motivation and fungi comprehension tests. Samples were taken using simple random sampling. Analysis of data used two way anova. Sampling with simple random sampling. Data analysis using two-way ANAVA. The results of the analysis show that: (1) There is an influence of understanding the concept of fungi after *guided discovery learning* through hands on activity (2) There is an influence of science learning motivation on understanding the concept of fungi. (3) There is an interaction of *guided discovery learning* through *hands on activity* and science learning motivation towards the concept understanding of fungi.

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Keyword : *guided discovery learnin, hands on activity, learning sains motivation, fungi concept understanding*

INTRUDUCTION

Indonesia is a tropical country that has natural resources that are rich in biodiversity. One of the biodiversity is mushroom. Mushrooms (fungi) are found in the surrounding environment. The fungus thrives in the rainy season, because mushrooms like moist habitats. Fungi can occupy various types of habitats such as: soil, wood, litter, animal waste or parasites in other living things. Some types of mushrooms have been widely used by humans as food and a source of medicinal ingredients. Mushrooms that can be consumed by humans as food include: ear mushrooms, oyster mushrooms, tempeh mushrooms, and various other types that have been developed. Ecologically, the fungus functions as a decomposer. The existence of mushrooms with all their functions and benefits in the environment, is very

interesting to be studied and used as one of the teaching materials in high school grade X.

Knowledge about the life of the fungus in the environment around students can be the initial provision of students to understand mushrooms more deeply. The understanding of mushrooms includes: an understanding of morphological characteristics, ways of life, ways of obtaining nutrition, reproduction, the role for the environment and its benefits for humans. To provide students with a good understanding of mushrooms from the concrete to the abstract, investigation is needed to develop curiosity through a discovery based on direct experience. Through scientific work utilizing facts, in order to develop new concepts, appropriate learning models and techniques are needed. Fun learning activities and learning centered on students, making learning outcomes higher than direct learning, Marjan et al (2014).

The fact is that mushroom learning still does not encourage students to build understanding of the concept of mushrooms that are learned independently, this is supported by the average daily test scores of students who still get scores below the KKM. This shows the students' low understanding of the mushroom concepts learned. In addition, based on the results of preliminary observations that have been made, the learning process still emphasizes the provision of direct knowledge by the teacher. Learners are taught only by memorizing concepts, and are less involved in learning activities. As a result, students are less motivated and do not understand the concepts learned well.

The solution to the problems described above requires a learning model that involves students to be active in constructing knowledge. Biology learning that involves students actively in learning activities so that they can understand fungi learning well, can be done using guided discovery learning learning models through hands on activity.

Discovery learning is a learning process that occurs when students are not presented with lessons in their final form, but students learn to organize their own learning material through activities such as observing examples, then are encouraged to identify what they want to know, followed by finding information and organizing and constructing what they want to know and understand from the learning activities they have passed, until new principles or concepts are found, in conclusion, Ministry of Education and Culture (2013). According to Hosnan (2014) several advantages of the discovery learning model include helping students to improve and enhance their cognitive skills and processes.

Discovery learning that is applied in learning according to Mayer (2004) there are 2 types, namely pure discovery and guided discovery. Techniques applied in guided discovery learning can be through minds on activity or hands on activity activities. Guided discovery learning activities using hands on activity techniques will have a greater effect on students, because students are actively involved in a number of activities and learning experiences directly by observing phenomena or manipulating objects to help the process of discovery and in-depth understanding, (Aprilia, 2016).

Guided discovery learning through hands on activity is a discovery learning technique that is designed by involving students in gathering information and asking questions, students move and discover, collect data and analyze and make their own conclusions. Students are given the freedom to construct thoughts and findings during activities so that students do it themselves with no load, fun and with high motivation. (Khoiliyah, 2008).

Guided discovery learning through hands on activity involves activities and direct experience with natural phenomena or learning experiences that actively involve students in manipulating objects to gain knowledge or understanding. Hands on activity centers on manipulative activities and practical activities that are used. Guided Discovery learning through hands-on activity is an experimental activity of students to find knowledge directly through their own experience, constructing understanding and knowledge (Daniah, 2012). Aprilia (2016) argues that the hands on activity assisted learning model has several advantages, including increasing learning activities, learning motivation and increasing the enjoyment of students in learning. Hands on activity-assisted learning can improve skills and expertise in communication, ways of thinking and making decisions on their own based on direct discovery and experimentation as well as increasing creativity and comprehension or perception.

Guided Discovery learning through hands on activity in improving the understanding of the concept of mushrooms in students is inseparable from external and internal factors. External factors come from outside the environment of students such as teachers, facilities and the learning climate created by the teacher. Internal factors come from among students, physical condition, interests and motivation. Motivation is the initial provision that students must have before participating in learning activities.

Learning motivation is one's desire to activate, move channel, direct the attitudes and behavior of individuals to learn. Mulyadi (2012) states that learning motivation is awakening and giving direction to encouragement that causes individuals to do the act of learning. Motivation possessed by students in each learning activity is very instrumental to improve learning outcomes. Students who have high motivation in learning make it possible to obtain high learning outcomes, Hamalik (2008). While the motivation to learn science is the urge or desire of students to follow science learning by carrying out a series of science learning activities, such as following the process of forming new concepts, critical thinking processes and carrying out science process skills, to follow science learning. There are six indicators of motivation possessed by students in participating in science learning, namely: self efficacy, active learning strategies, the value of science learning, performance goals, achievement goals and stimulation from the environment. Likewise students' motivation to participate in science learning activities as a whole can affect the results of learning science that will be obtained.

The use of learning models that are appropriate to the characteristics of the teaching material to be studied and the characteristics of students will determine the expected achievement of competencies, and the final impact on student learning outcomes. Therefore it is important for teachers to choose a learning model that is suitable with the material to be delivered so that students are motivated to participate in learning and have the ability to construct their understanding of what they are learning independently.
Referring to the learning difficulties experienced by students when learning concepts in kingdom fungi, guided discovery learning through hands on activity and high motivation in learning science are expected to increase students' understanding of the concepts contained in fungi material.

METHODS

The method used is a quasi-experimental method with the experimental design used is posttest-control design (Creswell, 2014). In this design the experimental class and the control class both conduct a post-test, only the experimental class is given treatment using guided discovery learning through hands on activity and the control class using guided discovery learning through image media.

RESULT

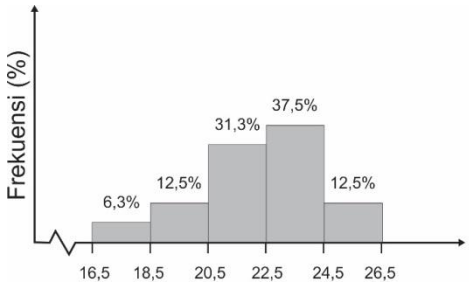

Figure 1. The score of understanding the concept of fungi in students using guided discovery earning through hands on activity with high scientific learning motivation

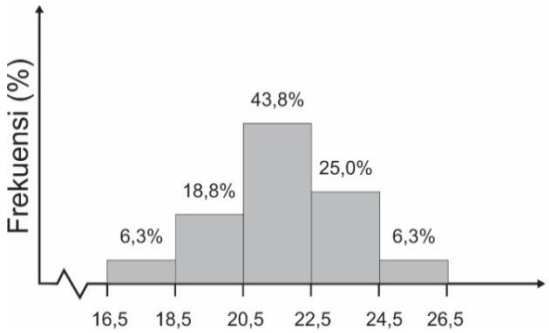

Figure 2. Scores of understanding the concept of kingdom fungi students using guided discovery learning through hands on activity and low motivation to learn science

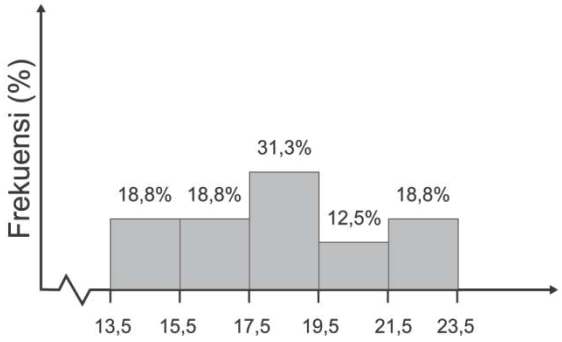

Figure 3. Score understanding of the concept of fungi students who use Guided discovery learning through media images and motivation to learn science is low

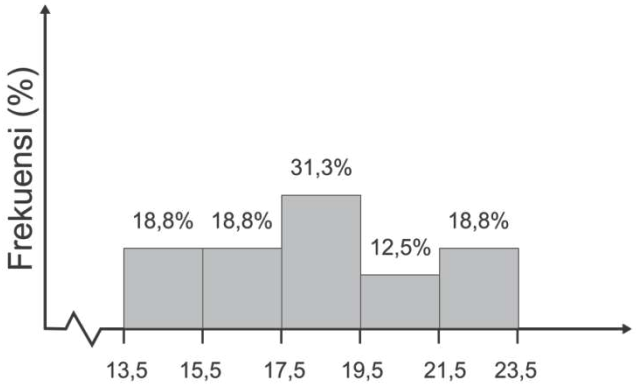

Figure 4. Scores of students 'understanding of students' consensus using Guided Discovery Learning through image media and low scientific learning motivation

Table 1. Two Way Anova Hypothesis Test Results

Source	Type III Sum of squares	df	Mean Square	F	Sig
Corrected Model	137.500a	3	45.883	9.475	.000
Intercept	28056.250	1	28056.250	5.8003	.000
Method	56.250	1	56.250	11.628	.001
Motivation	56.250	1	56.250	11.628	.001
Method * Motivation	25.000	1	25.000	5.168	.027
Error	290.250	60	4.838		
Total	28484.000	64			
Corrected total	427.750	63			

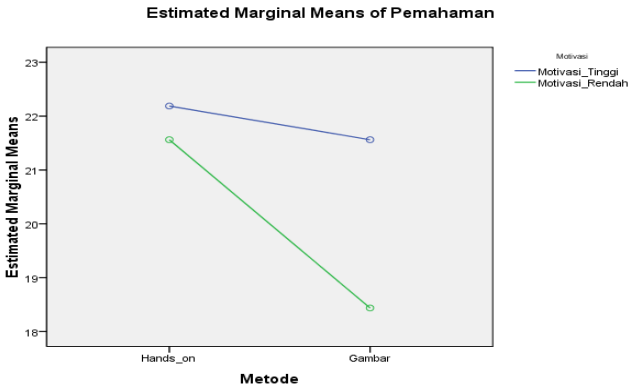

Figure 5. Graph of Influence of interaction between discovery learning models through hands on activity and science learning motivation towards understanding the concept of fungi

DISCUSSION

The guided discovery learning model has enormous potential to make learning experiences more meaningful for students in concept discovery. In the guided discovery learning process, students experience a mental process to assimilate a concept and principle. The mental process in question is the activity of observing, classifying, making guesses, explaining, measuring and making conclusions.

The guided discovery learning model has a close relationship with the understanding process. Understanding is a mental construction, an abstraction created by the human mind to reason the amount of different knowledge, besides the entrance to understanding are essential questions, (Grant W and Jay. M, 2012). This is in accordance with the first syntax in the guided discovery learning model, namely stimulation, where the teacher gives questions that are relevant to daily life in the environment of students, thus stimulating students to think and encourage exploration and direct students to understand what will become learning topic.

Understanding translates to develop when students make observations of the object being observed and exploration of information from various sources and discussions. In the activities of observation, exploration and discussion students try to translate the information obtained or give meaning to that information in an effort to provide answers to the problems given. These activities are contained in the syntax of guided discovery learning model namely problem statement, data collection syntax for exploration activities through hands on activities and data processing syntax through group discussion activities. Understanding of interpretation develops when students interpret the information obtained when explaining the meaning of a statement that takes place in the syntax of data collection and data processing. Likewise in the syntax verification, through the presentation and discussion of students will explain in detail the meaning or meaning of a concept or principle in mushrooms. The understanding of generalizing and inversing develops when students get practicum to predict the phenomena they face, for example when practicum grows bread mushrooms with various kinds of moisture and when observing the phenomenon of whether yeast is a living creature. Thus the guided discovery learning syntax has provided a meaningful learning experience for students in understanding the mushroom concepts learned. The results of relevant research have been carried out by Widiadnyana., Sadia. & Suastra. (2014) and it was concluded that there are differences in understanding of science concepts between students who learn by using the discovery learning model and students who learn by using a direct teaching model.

Guided discovery learning through hands on activity will emphasize more students to be actively involved in learning activities directly with the guidance of the teacher. Hands on activities carried out in the form of real activities such as: identifying, cutting, cutting, pairing or arranging objects, so that certain patterns are formed. With hands-on activity conducted by students during learning activities will form a deep appreciation and experience of learning in students in determining a meaning of a concept that is being studied.

The application of guided discovery learning through hands on activity involves many physical activities that involve the hands directly and the senses of students, such as the sense of sight, the sense of hearing, the sense of taste and the smell of smell in the activity of seeking information, asking questions, collecting and analyzing data activities to make conclusions . Students are given the freedom to construct their thoughts and findings during the activity, so that students do learning activities without burden and are fun to achieve better learning goals.

This is consistent with the results of research conducted by In'am (2017), which states that the discovery learning model through hands on activity is able to encourage student learning activities and the achievement of learning goals to be very good, (In'am, 2017). Other research results reinforce the influence of guided discovery learning also conducted by Balim (2009) stating that guided discovery learning has an effect on students 'perception scores, students' learning skills, academic achievement, knowledge retention, cognitive and affective levels with sufficient significance high. The benefits that can be obtained through hands-on-based learning are adding interest, motivation, strengthening memory, overcoming learning difficulties, avoiding misunderstanding, getting feedback from students and the most important is connecting the concrete and abstract, (Holstermann, 2010). This is in accordance with the characteristics of learning fungi learning a lot of abstract concepts, thus requiring more concrete techniques and media to make it easier for students to understand the concepts being taught.

Some of the strengths of the guided discovery learning model include helping students to improve and enhance their cognitive skills and processes (Hosnan, 2014). The discovery effort that students do is key in this process, and is supported by how students learn. Learning with guided discovery learning raises the enjoyment of students, because of the growing sense of inquiry and the desire to succeed. In addition the hands-on activities based learning model will improve cognitive learning achievement. The application of learning with hands on activities of students is required to make the subject matter become something more concrete and this will facilitate students in learning the subject matter that is taking place (Korwin, AR & Ronald, J, 1990).

Rahmawati (2012) added that with guided discovery learning through hands on activity, students will gain experience and new concepts in learning. In addition to proving facts and concepts, hands on activity also encourages students' curiosity in greater depth so it tends to arouse students to conduct research to gain observation and experience in the scientific process. Guided discovery learning through hands on activity is very relevant to constructivism learning theory which states that students must actively carry out activities, actively think, conceptualize and give meaning to the things being studied. In view of this theory students are considered to have the initial ability before learning something, so the teacher's role in the learning process only helps the process of building students' new knowledge. The constructivist also states that humans can know things through their senses, by interacting with objects and their environment through the process of seeing, hearing, touching, smelling and feeling people can know things. This also means in line with learning activities based on hands on activities.

Unlike the guided discovery learning model through drawing this model is relatively simpler and learning is less challenging for students to better explore their abilities in the inquiry process. The use of this picture is arranged and designed so that students can analyze the picture into a form of a brief description of what is in it. broadening understanding of the concept more deeply and more complexly, encouraging them to build concepts through the activity of observing images. According to Joyce B, Weil M & Calhoun E (2009), the weakness of image media is that not all material can be presented in the form of images. Picture as a visual media is a media that only relies on the sense of sight, namely the ability to analyze and identify examples of images in learning according to basic competencies. However, the image media has a concrete nature and can overcome the limitations of space and time. Because not all objects or objects can be brought into the class. Through the use of media images the attention of students will be increased. Students who see the picture will more easily understand the concept of fungi that are abstract. Students who learn by looking at pictures will remember what was seen and can later be used again when gaining new knowledge and when solving problems. This is reinforced by Edgar Dale's statement in Subramony (2003), that students who learn by looking at pictures or using their sense of sight will benefit 30%. Through picture media, students are easier to remember than just reading from a book or listening to an explanation to understand a concept. Through visual media it is still possible for students to interact with their environment, it can help instill complex basic concepts into more concrete

Based on the results of the analysis of the feasibility of learning can be explained that the learning process activities are going well and in accordance with the sequence of learning both in the experimental class and the control class. Classes that use guided discovery learning models through picture media are also good in the process of implementing learning, this can be seen in the implementation of learning (appendix 4). The results of Yuhernis, Lestari R, & Apniyanti E (2015) research stated that the discovery learning model with the help of images can help students to respond to the lessons presented, as well as help one another in each group when learning takes place.

Students who have high motivation to learn science, when learning takes place tend to show more enthusiasm for learning and a greater attitude of confidence compared to students who have low motivation to learn. This is in line with research conducted by Roissatun S.Z, Muttoharo & Sudibyo E (2015) which states that students who have high learning motivation, the higher the learning outcomes will be obtained. Vice versa, the lower the motivation to learn, the lower the learning outcomes that get. Besides students who have high learning motivation will have strategies in learning to achieve goals, will follow the learning activities well, try to fulfill the learning task and make efforts in order to get achievements or awards from the learning activities they do. Thus will produce a better understanding in learning. Conversely with students who have low learning motivation, will not try to participate in learning activities properly, this is likely due to the ability to fulfill low learning tasks, learning strategies undertaken by students are less precise, the learning methods used by teachers are less precise, so they do not there are efforts to achieve achievement in participating in learning activities. As a result, the understanding obtained by students about the concept of mushrooms being studied is low. This is relevant to the research results of Ames C & Archer J (1988), which states that the learning strategy and the motivation process that takes place on students will affect the achievement of learning goals.

The group of students who have high motivation to learn science shows the average score of understanding higher than the group of students who have low motivation to learn science. This is due to students who have high learning motivation have high encouragement and confidence in their ability to be able to fulfill their learning assignments, as seen from the achievement of the understanding scores obtained by students. Uncertainty arises when we experience something new, surprising, unworthy, or complex. This will cause high stimulation in the central nervous system. Human response when facing an uncertainty is what is called curiosity or curiosity. Curiosity will direct humans to behaviors that try to reduce uncertainty (Gagne, 1985).

In science learning, when the teacher demonstrates an experiment that gives unexpected results, this will cause conceptual conflict in students, and this will motivate to understand why the results of the experiment are different from what they think. Thus, the uncertainty created by the teacher has caused the curiosity of students, and students will be motivated to reduce the uncertainty in themselves. It can be concluded that curiosity is able to increase motivation. Students who have high learning motivation will have higher curiosity, so the desire to explore is also high, for the achievement of learning goals. In the learning process it is necessary to understand a competency goal that must be achieved. In the sense that the higher the motivation to learn science, the greater the opportunity for students to meet the demands of learning. Students who have high motivation to study science can arrange their learning to be able to understand the concepts provided by the teacher well in fungi material.

High science learning motivation provides better learning outcomes in understanding a teaching material in depth. This is in line with research conducted by Imawan (2015) reveals that in the teaching and learning process that uses guided discovery learning models through hands on activity theoretically can help the development of students in developing the knowledge and skills they have. So there is interaction between guided discovery learning models through hands on activity and science learning motivation towards understanding the concept of fungi learners.

Based on the average score of understanding the concept of fungi, it can be concluded that students who have high motivation to learn science can understand the concept of fungi presented in the learning process through guided discovery learning through hands on activity. The above description shows that the application of guided discovery learning models through hands on activity and high scientific learning motivation can help students in getting a good understanding of concepts about fungi as a result of student learning.

CONCLUSION

Based on the results of research that has been done, it can be concluded that the guided discovery learning model through hands on activity influences the understanding of the concept of fungi in students, there is an influence of students' learning motivation towards understanding the concept of fungi, and the guided discovery learning model through hands on activity interact with science learning motivation affect the understanding of the concept of fungi in students.

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