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Inquiry learning model in improving higher order thinking skills (HOTS) abilities in Madrasah Ibtidaiyah

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ABSTRACT

Education is an activity to increase person's general knowledge including increasing mastery of theory and skills, deciding and finding problems solutions related to activities in achieving their goals, whether problems in the world of education or everyday life. If formal education in an organization is process of developing abilities in the direction desired by the organization concerned. High Order Thinking Skills (HOTS) are also implemented by the government following still low ranking of the Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) compared to other countries, so that educational standards both in learning process and assessment are further improved by the government through the 2013 curriculum. (Ariyana et al., 2018). According to the revised Bloom's Taxonomy, cognitive processes are divided into two, there are high-level thinking skills or often referred as Higher Order Thinking Skill (HOTS), and low-level thinking skills Lower Order Thinking Skill (LOTS). Low-level thinking skills involve the ability to remember (C1), understand (C2) and apply (C3) while high-level thinking skills involve analysis and synthesis (C4), evaluate (C5), and create or creativity (C6). (Nugroho, 2018). When children have high-level thinking skills in learning process using inquiry that provokes or stimulates students' thinking to develop more analytical, evaluation and creative abilities in children. Students' ability to solve high-level thinking problems can be used by teachers to find out whether students already have high-level thinking skills in learning activities. HOTS-based learning can also provide benefits to students, there are improving achievement, increasing motivation and increasing positive attitudes.

1. Introduction

The high-level thinking skills expected in learning and implemented in behavior that students are able to analyze all events in society and develop them according to better context, then are able to evaluate activities that have and have not occurred in society and are able to create new products both in terms of innovation and creativity that are beneficial to society according to the context of modern life today.

To achieve objectives of learning activities, an appropriate learning method is needed. The method comes from Latin: metodos, which means the path that must be taken, in other words method is a way to do something to achieve goal. (Siagian et al., 2021). Meanwhile, the learning method is procedure or method that must be carried out by an educator in delivering lesson material so teaching and

learning process runs well in the sense that competencies or learning objectives can be achieved. (Nurhayati, 2016).

Of the several existing learning methods, researchers use guided Inquiry learning, learning that seeks to instill basics of scientific thinking in students who act as learning subjects, so that in this learning process students learn more by themselves, developing creativity in solving problems. When children already have high-level thinking skills, the learning process uses inquiries that provoke or stimulate students' thinking to develop more, giving rise to analytical, evaluation and creative abilities in children.

This is in line with previous research conducted by Astuti (Astuti, 2020) learning using this inquiry model can improve science learning outcomes of students at SDN 07 Central Bengkulu with significant results. Similar research was also conducted by Azmi (Azmi, 2020). His insight into the HOTS (High Order Thinking Skill) analysis was that there was a significant positive influence in Islamic Religious Education learning on students' critical thinking.

From this study, it is expected that learning will be more meaningful if students are invited to think at high level. The success of mastering a concept will be obtained when students are able to think at high level, where students can not only remember and understand concept, but students can analyze and synthesize, evaluate, and create concept well, the concept that has been understood can stick in students' memories for a long time, so it is very important for students to have high-level thinking skills or HOTS. One way to find out whether students already have high-level thinking skills is by conducting an assessment. Assessments in the form of tests can be used to hone students' thinking skills, and have an influence on determining students' thinking skills.

2. Method

In this writing, author uses method called library research method. This method has the meaning as a guideline in collecting various information and data assisted by various sources regarding the topic to be discussed, such as documents, books, magazines, articles, historical stories, and so on.

3. Findings and Discussion

3.1. Inquiry Learning

Inquiry comes from the English word inquiry which is interpreted as process of asking and finding out the answers to scientific questions asked. Scientific questions are questions that can lead to investigative activities on object of the question. In other words, inquiry is a process of obtaining and getting information by conducting observations and/or experiments to find answers or solve problems to questions or problem formulations by using critical and logical thinking skills. (Amri, 2010).

According to Wina Sanjaya, inquiry is series of learning activities that emphasize the process of thinking critically and analytically to find and discover answer problem in question. The thinking process itself is usually done through questions and answers between teachers and students. (Sanjaya, 2006). Meanwhile, according to Welch, inquiry is defined as a process in which humans seek information or understanding, so it is often called away from thought.

Meanwhile, Kidsvatter et al. explain inquiry as teaching model where teachers involve students' critical thinking skills to analyze and solve problems systematically (Sanjaya, 2006). This learning is learning activity that maximally involves all students' abilities to search for and investigate something (objects, people or events) systematically, critically, logos and analytically so that they can formulate their own findings with the role of teachers in inquiry learning more establishing themselves as guides or learning leaders and learning facilitators. Students do more activities themselves or in groups to solve problems with teacher guidance. The knowledge and skills acquired by students are expected not to be the result of remembering set of facts, but the result of finding them themselves. Teachers must always design activities that refer to discovery activities, whatever the material they teach.

Inquiry is teaching that requires students to process messages so they gain knowledge, skills and values. In inquiry learning, students are designed to be involved in conducting inquiries. This learning is student-centered learning. So it can be concluded that inquiry learning is a learning activity that involves all students' abilities to search for and investigate a problem critically, logically, and analytically so that students can find answers or solutions to the problem.

1) Characteristics of inquiry learning

In general, inquiry-based teaching has the following characteristics: Teachers try to stimulate students to think actively in the following ways:

(1) Asking mind-boggling questions
(2) Encouraging students to interpret explanations and formulate opinions
(3) Asking students to apply principles to various situations
(4) Encouraging students to process data and information
(5) Presenting students with problems, contradictions, implications, assumptions about values and value conflicts
(6) Teachers try to maintain a free atmosphere (permissive) and encourage students to dare to solve their own thoughts in the following ways:
    a) Be helpful and open to opinions
    b) Direct towards positive things.
    c) Be willing to accept and accept or consider all efforts proposed by students
    d) Encouraging, light-hearted and willing to grant.
    e) Giving students the opportunity to be creative and independent.
    f) Encouraging students to dare to exchange opinions and analyze different opinions and interpretations.
    g) Inquiry teaching involves various variations of solutions
    h) Inquiry strategies are open-ended. Even lessons are open-ended and controversial. (Alma et al., 2008).

2) Principles of Implementing Inquiry Learning

Inquiry is learning that emphasizes the intellectual development of children. Mental (intellectual) development according to Piaget in Wina Sanjaya is influenced by four factors, there are maturation, physical experience, social experience, and equilibration.

Maturation is a process of physiological and anatomical growth, the process of physical growth, which includes body growth, brain growth, and nervous system growth. Brain growth is one aspect that greatly influences a child's ability to think (intellectually). The brain can be said to be the center or center of human development and function. (Sanjaya, 2006). Physical experience is the physical actions carried out by individuals on objects in their environment. Physical actions or actions carried out by individuals allow them to develop activity or thinking power.

Social experience is an activity in relating to others. Through social experience, children are not only required to consider or listen to the views of others, but also to grow awareness that there are other rules besides their own.

Equilibration is the process of adjusting existing knowledge with new knowledge that is found. Sometimes children are required to update the knowledge that has been formed after they find new information that is not appropriate. Based on the explanation above, in the application of inquiry there are several principles that must be considered by every teacher. These principles are:

(1) Oriented towards intellectual development. The purpose of implementing this inquiry is to develop thinking skills. Thus, this learning is not only oriented towards learning outcomes but also oriented towards the learning process.
(2) The principle of interaction. The learning process is basically a process of interaction, both interaction between students and interaction between students and teachers, even interaction between students and the environment. Learning as an interaction process means placing teachers not as a source of learning, but as a regulator of the environment or regulator of the interaction itself. (Sanjaya, 2006)
(3) The principle of asking. The ability of educators to ask questions in every step of the inquiry is very necessary, because the ability of students to answer questions is basically part of the thinking process.
(4) The principle of learning to think. Learning is not just remembering a number of facts, but learning is a process of thinking (learning how to think), the process of developing the potential of the entire brain.

(5) The principle of openness. Learning is a process of trying various possibilities. Therefore, children need to be given the freedom to try according to the development of their logical and reasoning abilities.

3) Inquiry Learning Objective

Objectives are ideals that will be achieved in teaching and learning activities. Objectives will provide direction to where teaching and learning activities will be achieved if a teacher can choose and apply the right strategy. Objectives are formulated so that students have certain skills, so the strategies or methods used must be in accordance with the objectives.

A teacher should use strategies or methods that can support teaching and learning activities, so that they can be used as effective tools to achieve learning objectives. The learning process that uses inquiry, emphasizes direct student research, must be invited to practice in everything. The purpose of inquiry is that students are invited to think, solve problems and find something through their experiences. In principle, the purpose of inquiry teaching is to help students formulate questions, find answers or solutions to satisfy their curiosity and help their theories and ideas about the world. Questioning activities are very useful for exploring information about students' abilities in mastering subject matter and guiding students to find and conclude for themselves. (Syaefudin, 2009). Inquiry-based learning aims to encourage students to be more courageous and creative in imagining, students are guided to create discoveries, both what already exists, and to create ideas, concepts, or tools that have never existed before. (Anam, 2015).

The purpose of using inquiry is to develop the ability to think systematically, logically and critically, or develop intellectual abilities as part of the mental process. Thus, students are not only required to master the learning material, but how they can use their potential and also develop their level of thinking.

The main objective of inquiry learning is to help students develop intellectual discipline and thinking skills by asking questions and getting answers based on their curiosity. This inquiry learning is a form of student-centered learning approach. It is said so because in this learning, students play a very dominant role in the learning process.

3.2. High Level Thinking Skills (HOTS)

Higher Order Thinking Skills is process of student thinking at higher cognitive level which is developed from various concepts of cognitive methods and learning taxonomies such as problem solving methods, Bloom's taxonomy, and learning, teaching, and assessment taxonomies. (Nugroho, 2018).

Higher order thinking skills include problem solving skills, creative thinking skills, critical thinking skills, argumentation skills, and decision-making skills. According to King, higher order thinking skills include critical, logical, reflective, metacognitive, and creative thinking. In higher order thinking, students will be able to distinguish ideas or concepts clearly, argue well, solve problems, construct explanations, hypothesize, and understand complex things more clearly. Higher order thinking skills occur when someone associates new information with information that is already stored in their memory and associates it and/or rearranges and develops the information to achieve a goal or find a solution to a difficult situation.

The main objective of higher order thinking skills is how to improve students' thinking skills at a higher level, especially those related to the ability to think critically in receiving various types of information, think creatively in solving a problem using existing knowledge and making decisions in complex situations.

The conclusion from several opinions above is that Higher Order Thinking Skills (HOTS) in learning requires students' thinking skills to include analyzing, analyzing, and creating. Students can apply it in everyday life so that they are able to solve a problem if the student is able to solve a problem and is able to use their knowledge in new situations of students. (Nugroho, 2018).

1) Analyze

Analyzing involves the ability to break a whole into its parts and determine how the parts relate to each other or to the whole. Analysis emphasizes the ability to break down something into its constituent parts and see the relationships between the parts. At the analysis level, a

person will be able to analyze incoming information and divide or structure the information into smaller parts to recognize patterns or relationships and be able to recognize and distinguish the causes and effects of a complex scenario. The Analyze category includes the ability to differentiate, organize, and attribute.

(1) Differentiating
Differentiating involves the ability to distinguish parts of a whole structure in an appropriate form. In science learning, the goal is to distinguish between an opinion or a fact related to a scientific theory. The assessment asks students to determine what is an opinion or a fact regarding the scientific theory being studied or practiced.

(2) Organizing
Organizing includes the ability to identify elements together into an interrelated structure. In science learning, an example of the goal is that students are able to organize all science tools, materials and their uses well and in a structured manner. The assessment asks students to organize and group tools, materials and their uses in science activities.

(3) Attributing
Attributing is the ability of students to mention the point of view, bias, value or intent of a problem that is presented. Attributing requires more basic knowledge in order to guess the intent of the core of the problem that is presented. Attributing can be accessed by providing written or oral material and then asking students to create or choose a description of the author's opinion and purpose.

2) Evaluate

Evaluating is defined as the ability to make judgments based on certain criteria and standards. Criteria are often used to determine quality, effectiveness, efficiency, and consistency, while standards are used to determine quantity and quality. Evaluation includes the ability to form an opinion about something or several things, along with the accountability of that opinion based on certain criteria. The existence of this ability is expressed by giving an assessment of something. The assessment category consists of Checking (checking) and Critiquing (criticizing).

(1) Checking
Checking is the ability to re-examine a scientific work or scientific research results against scientific theories or scientific disciplines. Checking tasks can utilize processes or products given to students or created by students.

(2) Criticizing
Criticism is the ability to provide input and presentation of one's own ideas that are associated with scientific theory. In science learning, the goal is to learn to assess what is right and wrong according to science.

3) Create

Create is defined as generalizing new ideas, products or new perspectives from an event. Create here means putting several elements into a whole unit so that it is formed in a coherent or functional form. Students are said to be able to Create if they can make new products by restructuring several elements or parts into a form or structure that has never been explained by the teacher before. The Create process is generally related to the learner's previous learning experiences. The Create process can be broken down into three phases: the problem is given, where the learner tries to understand the problem, and comes up with possible solutions. Planning the solution, where the learner examines possibilities and thinks about the design to be implemented; and implementing the solution, where the learner successfully carries out the plan.

(1) Formulating (Generating)
Formulating involves the process of describing the problem and making choices or hypotheses that meet certain criteria. In science learning is able to formulate a hypothesis or research design.

(2) Planning
Planning involves the process of planning a problem-solving method that fits the criteria of the problem, namely making a plan to solve the problem. In science learning, an

example of the objective can describe the research steps from the hypothesis or title created.

(3) Producing
Producing involves the process of carrying out a plan to solve a problem that meets certain specifications. In science learning, students are asked to make products according to scientific theories from science or from a scientific idea.

4. Conclusion

The ability of students to analyze with the Inquiry method in science learning has 3 categories, the first is the ability of students to differentiate, namely being able to conclude information that is relevant to the concept of science. The second is the ability of students to organize, namely being able to identify and group from a structure of information presented. The last is the ability to attribute, namely students are able to relate concepts that occur in the surrounding environment or prove that it is not something that is an opinion but a fact.

The ability of students to create or create is categorized into 3, namely the first students are able to formulate, students can make hypotheses and correlations. The second students are able to plan their understanding or find their own information to be planned in real forms such as research. The third or last students are able to produce or execute from the formulation and planning that has been made and can also create new things or new products that are useful for others according to the teacher's assignment.

The ability to evaluate students in learning with the Inquiry method consists of 2 categories, namely the first is the ability of students to examine or check, students are able to examine according to the procedure. The second is the ability of students to criticize, namely the ability of students to find problems in the process, products and scientific statements that are considered correct according to the HOST Ability in Inquiry Learning.

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