

EFFECTIVE LEARNING MODELS FOR IMPROVING HIGH ORDER THINKING SKILLS (HOTS) OF ELEMENTARY SCHOOL STUDENTS

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Abstract

High order thinking skills (HOTS) is an educational reform concept based on Bloom's taxonomy that began in the early 21st century. The achievement of higher order thinking skills or HOTS for students starting from the elementary school level is very important because Indonesia's education rankings are still low. It was recorded that in 2015 Indonesia was ranked 64th out of 72 countries that participated in PISA, and ranked 45th out of 48 countries that participated in TIMSS. The role of the teacher in designing learning that can improve high order thinking skills (HOTS) in students is also very necessary. Models of Discovery/Inquiry Learning, Problem-based Learning, and Project-based Learning are learning models that can be used to improve higher order thinking skills (HOTS) in students. This study aims to examine the literature on effective learning models in improving high order thinking skills (HOTS) in elementary school students. This research uses the library method. The library method is a method that uses library sources, articles, journals, books, and so on as a reference source in this study. From several studies, it is stated that the Discovery/Inquiry Learning, Problem-based Learning, and Project-based Learning models are effective in increasing HOTS in elementary school students.

Keywords: *Effective Learning Model, HOTS, Elementary School Students*

A. Introduction

High order thinking skills (HOTS) is an educational reform concept based on Bloom's taxonomy that began in the early 21st century. According to Thomas &

Thorne in Nugroho, HOTS is a "higher way of thinking than memorizing facts, presenting facts, or applying rules, formulas, and procedures" (Nugroho, 2018, p. 16). HOTS can also be said as a thinking process that links old information with newly acquired information to develop information towards more complex stages that aim to solve problems (Hanifah, 2019, p. 5). HOTS also means a thinking process that involves individuals in the process of analyzing, evaluating and creating something as a step in solving problems. Therefore, it can be interpreted that HOTS is an ability that involves thinking processes through the process of analysis, evaluation and creation as an effort to solve everyday problems (Ully Fauziah, 2020, p. 203).

The achievement of high order thinking skills or HOTS for students starting from the elementary school level is very important, because education in the 21st century is different from education in the past decade. The fundamental difference lies in the achievement of student learning outcomes. Learning outcomes in 21st century education are not only in mastering all learning materials but also require students to have cognitive skills and social skills (Haryanti, 2017, p. 58).

The role of the teacher in designing learning that can improve high order thinking skills (HOTS) in students is also very necessary. This is due to the low ranking of Indonesian education. It was recorded that in 2015 Indonesia was ranked 64th out of 72 countries that participated in PISA, and ranked 45th out of 48 countries that participated in TIMSS (Putu Manik Sugiari Saraswati, 2020, p. 258). These low results require the Indonesian education sector to prepare to face the rapid development of 21st century knowledge and technology, such as equipping students with HOTS in learning.

There are ways that can be used to improve students' higher order thinking skills. For example, teachers can design learning designs by using certain learning models. Implementation of the 2013 Curriculum according to Permendikbud No. 22 of 2016 concerning Process Standards using 3 (three) learning models which are expected to shape scientific, social behavior and develop curiosity. The three models are (1) the Learning Through Discovery/Inquiry Learning model, (2) the Problem-based Learning model, (3) the Project-based Learning model (Yoki Ariyana, 2018, p. 29).

This study aims to examine the literature of the Discovery/Inquiry Learning model, Problem-based Learning model, and Project-based Learning model in improving high order thinking skills (HOTS) in elementary school students. From a number of previous studies, it is stated that the Discovery/Inquiry Learning, Problem-based Learning, and Project-based Learning models are effective in increasing HOTS in elementary school students. For example, a study by Rujiani showed that learning science in Class V SDN Tlogowungu 02 Semester 2 of the 2019/2020 academic year using the inquiry learning model could improve students' HOTS abilities (Rujiani, 2021, p. 151).

There is also a study by Kafiga Hardiani Utama and Firosalia Kristin which aims to re-analyze the effect of using *problem based learning* (PBL) learning models in improving the critical abilities of students in elementary schools in science learning content. Based on the results of the analysis of national journal articles and based on the results of the *paired samples test*, the *problem based learning* model has an effect on increasing students' critical thinking skills. The initial average gain was 4999.23 to 7757.85 with an overall average gain of 66.18%. (Kafiga Hardiani Utama, 2020, p. 889).

In addition, from the results of Aniswati Nahdiah and Sri Lestari Handayani's research entitled "Pengaruh Model Project Based Learning Berbantuan Google Meet terhadap Kemampuan Berpikir Kreatif Siswa", explained that there is an effect of Google Meet assisted project based learning on students' creative thinking skills in grade V elementary school ecosystem materials. Negeri Pinang Ranti 01. Project based learning can help participants to develop and improve their creative thinking skills (Nahdiah, 2021, p. 2382). Based on this description, the authors are interested in conducting research with the title "Effective Learning Model For Improving High Order Thinking Skills (HOTS) of Elementary School Students".

The method used in this study uses a *library research* method or approach. Literature study can be defined as a series of activities related to the methods of collecting library data, reading and taking notes and processing research materials. In literature or library research, there are four main characteristics: *First*, that the writer or researcher is dealing directly with text or numerical data, not with direct knowledge in the field. *Second*, library data is "ready to use" meaning that

researchers do not go into the field because they are dealing directly with data sources in the library. *Third*, that library data are generally secondary sources, in the sense that researchers obtain materials or data from second-hand sources and not original data from first-hand data in the field. *Fourth*, that the condition of library data is not limited by space and time (Junika Purnama, 2021, p. 272). Based on this, the data collection in this study was carried out by reviewing and exploring several research journals, books, and data sources that were considered relevant to the research or study to be analyzed and then presented in the results and discussion so that a conclusion could be drawn.

B. Discussion

1. Model Discovery/Inquiry Learning

Definition of Discovery/Inquiry Learning Model

The of Discovery/Inquiry Learning model is to understand concepts, meanings, and relationships through an intuitive process to finally arrive at a conclusion. Discovery occurs when the individual is primarily involved in the use of his mental processes to discover some concepts and principles. Discovery is done through observation, classification, measurement, prediction, determination and inference. The process is called the cognitive process while discovery itself is the mental process of assimilating concepts and principles in the mind (Yoki Ariyana, 2018, p. 29).

The term *inquiry* comes from English, namely inquiry which means a question or investigation. Inquiry learning is a series of learning activities that involve maximally all students' abilities to search and investigate systematically, critically, logically, analytically, so that students can formulate their own findings with confidence (Trianto, 2007, p. 135). Meanwhile, according to Sanjaya, inquiry learning is a series of learning activities that emphasize critical and analytical thinking processes to seek and find answers to a problem in question (Sanjaya, 2006, p. 194).

Purpose of Discovery/Inquiry Learning Model

The main purpose of inquiry learning is to help students develop intellectual discipline and thinking skills by asking questions and getting answers on the basis of

their curiosity (Sanjaya, 2006, p. 195). In addition, inquiry can develop values and attitudes that are needed so that students are able to think scientifically, such as:

- a. Skills for observing, collecting and organizing data, including formulating and testing hypotheses and explaining phenomena
- b. Independent learning
- c. Verbal expression skills
- d. The ability to think logically, and
- e. Awareness that science is dynamic and tentative.

Characteristics of the Discovery/Inquiry Learning Model

Inquiry learning has three characteristics, namely as follows (Sanjaya, 2006, p. 195):

- a. Inquiry learning emphasizes the maximum activity of students to seek and find, meaning that this learning places students as learning subjects. In the learning process, students not only act as recipients of lessons through verbal teacher explanations, but they play a role in finding out for themselves the essence of the subject matter itself.
- b. All activities carried out by students are directed to seek and find their own answers to something in question, so that it is expected to foster an attitude of self-confidence. Learning activities are usually carried out through a question and answer process between teachers and students. Therefore, the teacher's ability to use questioning techniques is a major requirement in conducting inquiry.
- c. The purpose of using inquiry strategies in learning is to develop the ability to think systematically, logically, and critically, or to develop intellectual abilities as part of a mental process. Thus, in inquiry students are not only required to master the subject matter, but how they can use their potential.

Principles of Discovery/Inquiry Learning Model

In inquiry learning there are several principles that must be considered by teachers, namely as follows (Sanjaya, 2006, p. 195) :

- a. Intellectual Development Oriented

It has been mentioned earlier that the main goal of inquiry learning is to develop thinking skills, because inquiry is based on cognitive theory which emphasizes the importance of one's internal processes. Thus, inquiry learning is not

only oriented to learning outcomes, it is also oriented to the learning process. Therefore, the criteria for success in inquiry learning are not determined by students' mastery of a subject matter, but the extent to which students are active in searching and finding something. In this inquiry, what is assessed is the process of discovering new things for themselves and the continuous adaptation process that is appropriate and harmonious between the new things and the cognitive structures that students already have.

b. Interaction Principle

Basically, the learning process is a process of interaction, both student-teacher interaction, student-student interaction, and student-environment interaction. Learning as an interaction process means placing the teacher not as a source of learning, but as a regulator of the interaction itself. Learning activities while using the inquiry approach are determined by student interaction. The whole learning process will help students become independent, confident and confident in their own intellectual abilities to be actively involved. Teachers only need to be facilitators and direct students to develop their thinking skills through their interactions. Teachers should also focus on learning objectives, namely developing higher levels of thinking and critical thinking skills of students (Trianto, 2007, p. 140).

c. The Principle of Asking

Inquiry is asking questions, that is, questions that can be answered and lead to meaningful testing and exploration. During inquiry learning, teachers can ask a question or encourage students to ask their own questions, which can be open-ended, giving students opportunities to direct their own investigations and find possible answers on their own, and lead to more another question. Therefore, the role that the teacher must play in inquiry learning is as a questioner. Because, the ability of students to answer each question is basically already part of the thinking process.

d. Principles of Learning to Think

Learning is not just remembering a number of facts, but learning is a process of thinking (learning how you think), namely the process of developing the potential of the whole brain. Learning to think is the maximum utilization and use of the brain.

e. Principle of Openness

Inquiry provides students with a variety of concrete experiences and active learning that encourages and provides space and opportunities for students to take the initiative in developing problem-solving, decision-making, and research skills so as to enable them to become lifelong learners. and energy for students to ask questions and views that are logical, objective, and meaningful, and to report their hypotheses. The teacher's job is to provide space to provide opportunities for students to develop hypotheses and openly prove the truth of the hypotheses they propose.

Thus, the main roles of teachers in inquiry learning are: First, Motivator. Provide stimulation so that students are active and excited to think. Second, Facilitator. Shows a way out if there are obstacles in the student's thinking process. Third, the questioner. Make students aware of the mistakes they make and give confidence in themselves. Fourth, Administrators. Responsible for all activities in the class. Fifth, Director. Leading the flow of student thinking activities on the expected goals. Sixth, Manager. Manage learning resources, time, and class organization. Seventh, Rewarders. Giving awards to achievements achieved in order to increase the spirit of inquiry in students (Trianto, 2007, p. 136).

Various Implementations of the Inquiry Model

Sund and Trow Bridge in Mulyasa suggest three kinds of inquiry learning methods, as follows (Mulyasa, 2007, p. 109):

a. Guide inquiry

Students receive guidelines as needed. The guidelines are usually in the form of guiding questions. This method is used especially for students who have not experienced learning with the inquiry discovery learning method, in this case the teacher provides guidance and direction that is quite broad. In the early stages of learning, more guidance is given, and little by little it is reduced according to the development of student experience. In practice, most of the planning is made by the teacher. Students do not formulate problems. Extensive instructions on how to organize and record data were provided by the teacher.

b. Free inquiry

In free inquiry discovery learning, students conduct their own research like a scientist. Students must be able to identify and formulate various problem topics to be investigated. The implementation involves students in certain groups. Each group member has a task, for example coordinator, technical advisor, recording data and evaluating the process.

c. Modified free inquiry

In inquiry discovery learning, the teacher gives a problem or problem, then students are asked to solve the problem through observation, exploration, and research procedures.

Inquiry Learning Model Steps

Zaenal Mustakim suggests the steps of implementing the inquiry learning model are as follows (Mustakim, 2017, p. 106):

- a. Orientation. In this orientation stage, the teacher as educator does the following:
 - 1) Explain the topics, objectives and learning outcomes that are expected to be achieved by students.
 - 2) Explain the main activities that must be carried out by students to achieve goals. At this stage, the steps of inquiry and the purpose of each step are explained, starting from the step of formulating the problem, to formulating conclusions.
 - 3) Explain the importance of learning topics and activities. This is done in order to provide student learning motivation.
- b. Formulate the problem. There are several things that must be considered in formulating the problem are:
 - 1) The problem should be formulated by the students themselves.
 - 2) The problems studied contain riddles for which there must be answers.
 - 3) The concepts in the problem are concepts that are already known in advance by students.
- c. Propose a hypothesis. Hypothesis is a temporary answer to a problem that is being studied. The ability to propose this hypothesis is done by guessing or guessing the answer to a problem.

- d. Collecting data. At this stage, students collect the information needed to prove whether the hypothesis can be accepted or not. This information search process can be sourced from various relevant learning sources.
- e. Test the hypothesis. As for testing the hypothesis is the process of determining the answers that are considered acceptable in accordance with the data or information obtained, based on data collection. The truth of the answers given is not only based on arguments, but must be supported by data found and can be accounted for.
- f. Formulate conclusions. At this stage, students describe the findings obtained based on the results of hypothesis testing. To reach accurate conclusions, teachers should be able to show accurate data to students.

Advantages and Disadvantages of the Inquiry Learning Model

Hamruni explained that the inquiry learning model has advantages and disadvantages as follows (Hamruni, 2009, pp. 143-144) :

- a. Advantages of the Inquiry Learning Model
 - 1) Emphasizing the development of cognitive, affective and psycho-motor aspects in a balanced way, so that learning through this model is considered more meaningful.
 - 2) Giving conclusions to students to learn according to their learning style.
 - 3) In accordance with the development of modern learning psychology which considers learning is a process of changing behavior through experience.
 - 4) Able to serve the needs of students who have abilities above average, so that students who have good learning abilities are not hampered by students who are weak in learning
- b. Weaknesses of the Inquiry Learning Model
 - 1) Difficult to control student activities and success.
 - 2) It is not easy to design it, because it collides with student habits.
 - 3) Sometimes the implementation takes a long time, so the teacher is difficult to adjust it to the allotted time.
 - 4) As long as the criteria for learning success are determined by the ability of students to master the subject matter, then this model will be difficult to implement by every teacher

Discovery/Inquiry Learning Model to Improve Higher-Level Thinking Skills for Elementary School Students

By using the Discovery/Inquiry Learning learning model, students are expected to be able to solve all the problems they encounter both at school and in real life. Learning with the Discovery/Inquiry Learning model presents concepts to create learning oriented to students' thinking activities. Thus, it is hoped that the Discovery/Inquiry Learning model can improve critical thinking skills and student learning outcomes.

By applying things that are close and liked by students, one of them is by using the Discovery/Inquiry Learning learning model. Knowledge is acquired through “remembering, understanding, applying, analyzing, evaluating, creating”. Skills are acquired through the activity of "observing, asking, trying, reasoning, presenting, and creating". The characteristics of competence and differences in the acquisition trajectory also influence the characteristics of the standard process. To strengthen the scientific approach (scientific), integrated thematic (thematic between subjects), and thematic (in a subject) it is necessary to apply a disclosure/research-based learning model (discovery/inquiry learning) (Kemendikbud, 2016).

Based on the research that has been done, one of them in research by Toni Hidayat et al. In his journal entitled “Meningkatkan Kemampuan Berpikir Kritis dan Hasil Belajar Siswa Kelas IV Melalui Model Discovery Learning Tema Keindahan Keberagaman di Negeriku” the conclusion is as follows (Hidayat, 2019, p. 9) :

- a. The critical thinking ability of students who use the Discovery Learning learning model is better than those using the conventional learning model.
- b. Student learning outcomes in learning using the Discovery Learning learning model are better than using conventional learning models.
- c. There is a positive relationship between critical thinking skills and improving student learning outcomes.

Meanwhile, in Pristy Nandya Putri's research entitled “Pengaruh Strategi Inkuiri Terbimbing dan Kolb's Learning Style terhadap Kemampuan Berpikir Tingkat Tinggi” explains that there is an influence between guided inquiry learning model on students' higher order thinking ability. Students who were taught using the

guided inquiry model obtained an average HOTS score (71.22) which was higher than those taught by the verification model (65.67) (Putri, 2018, p. 1663).

Based on the description above, it can be concluded that the discovery/inquiry learning model is one of the models that can be used in improving students' higher order thinking skills (HOTS) in elementary schools.

2. Problem Based Learning Model

Definition of Problem Based Learning Model

Arends, as quoted by Rezkillah (Inang Irma Rezkillah, 2020, p. 258), explained that *Problem Based Learning* is a model that uses an approach to authentic problems that can make students construct their own knowledge, develop higher skills, inquiry, become self-reliant, and increase self-confidence. *Problem Based Learning* is an instructional learning model that encourages students to learn through an authentic problem. *Problem Based Learning* learning model supports students to find solutions to problems substantially and relevantly.

Margetson, as quoted by Haryanti (Haryanti, 2017, p. 59), states that Problem Based Learning is a learning model that can help students to improve the development of lifelong learning skills in an open, reflective, critical, and active learning mindset, as well as facilitates successful problem solving, communication, group work, and interpersonal skills better than other models.

Characteristics of Problem Based Learning Model

There are three main characteristics of problem-based learning. *First*, problem-based learning is a series of learning activities, meaning that in the implementation of problem-based learning there are a number of activities that students must do. Problem-based learning not only expects students to just listen to notes, then memorize the subject matter, but through problem-based learning students actively think, communicate, search and process data, and finally conclude. *Second*, learning activities are directed at solving problems. Problem-based learning places problems as the keywords of the learning process. That is, without problems, there can be no learning process. *Third*, problem solving is done by using a scientific thinking approach. Thinking using a scientific approach to thinking is a deductive and inductive thinking process. This thinking process is carried out systematically and empirically. Systematic means that scientific thinking is carried out through certain

stages; while empirical means that the problem solving process is based on clear data and facts (Herminarto Sofyan, 2017, p. 51).

The Purpose of the Problem Based Learning Model

Problem Based Learning is a learning model whose process requires critical and creative thinking to find solutions in problem solving. This creative thinking requires higher order thinking skills. However, high-level thinking in question still pays attention to basic abilities. The goal to be achieved by the Problem Based Learning model is the ability of students to think critically, analytically and logically to find alternative problem solving through empirical data exploration in order to foster a scientific attitude (Sanjaya, 2011, p. 216).

The main goal of *problem based learning* is not the delivery of large amounts of knowledge to students, but rather on developing critical thinking skills and problem solving abilities and at the same time developing students' abilities to actively build their own knowledge. *Problem based learning* is also intended to develop independent learning and social skills of students. Independent learning and social skills can be formed when students collaborate to identify relevant information, strategies, and learning resources to solve problems (Herminarto Sofyan, 2017, p. 53).

In detail, *problem based learning* aims to build and develop learning that meets the three learning domains (*taxonomy of learning domains*). The first is the cognitive field (*knowledges*), which is the integration of basic and applied sciences. The existence of problem solving to real problems directly encourages students to apply existing basic knowledge. Second, the psychomotor field (*skills*) in the form of training students in scientific problem solving (*scientific reasoning*), critical thinking, direct self-learning and *life-long learning*. The third is the affective field (*attitudes*) in the form of self-character development, development of human relationships and psychologically related self-development (Herminarto Sofyan, 2017, p. 53).

Steps of Problem Based Learning Model

According to Sufairoh as quoted by Purnama, et al. The steps of the problem based learning model are as follows (Junika Purnama, 2021, p. 275):

- a. Orient students to the problem. This stage is to focus students on observing the problem that is the object of learning.

- b. Organizing learning activities. Organizing learning is one of the activities so that students submit various questions (or ask) about the study problem.
- c. Guiding independent and group investigations. At this stage, students conduct experiments (try) to obtain data in order to answer or solve the problem under study.
- d. Develop and present the work. Students associate data found from experiments with various other data from various sources.
- e. Analysis and evaluation of the problem solving process. After students get answers to existing problems, then they are analyzed and evaluated.

Advantages and Disadvantages of Problem Based Learning Model

Abiddin Nata stated that PBL has several advantages, including (Nata, 2009, p. 250) :

- a. PBL can make education in schools more relevant to life,
- b. PBL can familiarize students with dealing with and solving problems skillfully, which can then be used to deal with real problems in society
- c. PBL can stimulate the ability to think creatively and thoroughly, because in the learning process students do a lot of mental processes by highlighting problems from various aspects.

The advantages of the problem-based learning model according to Wina Sanjaya are as follows (Sanjaya, 2006, p. 220) :

- a. Problem solving is a great technique for understanding learning content.
- b. Problem solving stimulate students' ability to discover new knowledge for them.
- c. Problem solving improve student learning activities.
- d. Problem solving help students to apply their knowledge in everyday life.
- e. Problem solving help students to practice thinking in the face of something.
- f. Problem solving considered fun and more popular with students.
- g. Problem solving provide opportunities for students to apply their knowledge in real life.
- h. Problem solving develop students' interest in learning.

Weaknesses in the application of the PBL model include (Sanjaya, 2006, p. 221):

- a. PBL model learning takes a long time.

- b. When students do not have interest or do not have confidence that the problem being studied is difficult to solve, then they will feel reluctant to try it
- c. without students' understanding of the importance of solving the problems they are learning, they will not learn what they want to learn.

Problem Based Learning Model to Improve Higher Order Thinking Skills of Elementary School Students

Elementary school students are children who have an age range of 7 to 11 years. This is in accordance with Piaget's opinion in Susanto, which states that "Elementary school students are in the concrete operational stage (ages 7-11 years)" (Susanto, 2013). The application of the Problem Based Learning model is in accordance with the level of cognitive development and also the characteristics of elementary school students. Elementary school students are able to think systematically through concrete objects or solve real problems. Elementary school students have the characteristics of happy to play, love to move, like to be in groups, and like to do things directly. Based on this, the application of the Problem Based Learning model is very suitable for use in elementary schools in building students' critical thinking skills. This critical thinking ability will bring students to be able to solve problems that arise in the students' real world (Haryanti, 2017, p. 57).

According to Hartati and Sholihin in Nugraha, the key variables in problem-based learning are problems and information obtained. So, the problem based learning model uses contextual problems to provide stimulation to students in order to arouse students' curiosity, so that students are more motivated to seek information as a solution to the problem. The process of finding information in order to solve this problem will help students in building their knowledge as well as develop students' critical thinking skills (Nugraha, 2018, p. 122).

Based on the literature study conducted by researchers, there are many studies that prove that the problem based learning model can improve the higher-order thinking skills of elementary school students, such as research by Uly Fauziah conducted on fifth grade students of SDN 05 Birugo Bukittinggi. The results of classroom action research show an increase in the high-level thinking skills of elementary school students using problem based learning (Uly Fauziah, 2020, p. 202). In addition, there is research by Siti Aminatul Hasanah which shows the

application of problem-based learning methods with mind map media in science subjects in grade 3 MI Salafiyah Syafi'iyah material changes in the shape of objects can improve thinking skills high level (HOTS). This can be seen from the increasing number of students who are able to answer the questions given by the researcher (Siti Aminatul Hasanah, 2018, p. 72).

3. Project-Based Learning Model

Definition of Project-Based Learning Model

Project-Based Learning comes from John Dewey's idea about the concept of "Learning by Doing" which is the process of obtaining learning outcomes by doing certain actions according to their goals, especially children's mastery of how to do a job which consists of a series of behaviors to achieve a goal (Jelita Panjaitan, 2020, p. 82).

According to Gulay in Nyihana, the Project Based Learning model which lays its foundations on project studies is an approach which positions the learners in the center of the learning process and prepares the to the actual life by exposing them to real life problems . PjBL is defined as learning that directly involves students in the learning process through research activities to work on and complete a particular learning project (Nihanya, 2021, p. 44).

The George Lucas Educational Foundation defines: PjBL (Project Based Learning) is curriculum fueled and standards based. Project Based Learning addresses the required content standards. With project based learning, the inquiry process starts with a guiding question and lends itself to a collaborative project that integrates various subjects within the curriculum (Nihanya, 2021, p. 44). PjBL (Project Based Learning) is curriculum-based and standards-based. Project Based Learning addresses the required content standards. With project-based learning, the inquiry process begins with guiding questions and is suitable for collaborative projects that integrate various subjects in the curriculum.

It can be concluded that PjBL is a learning process in which students are active in carrying out scientific activities based on standard procedures in learning syntax to produce products in the form of tools, writing or objects as a result of projects that have been done by students (Nihanya, 2021, p. 45).

Project-Based Learning Model Steps

The steps (syntax) of project-based learning as developed by The George Lucas Educational Foundation (2005) consist of, (1) asking students essential questions, (2) designing project plans, (3) compiling a schedule of activities, (4) monitoring student activity, (5) assessing student success, and (6) evaluating student experience (Hikmatul Fitri, 2018, p. 201).

Advantages and Disadvantages of Project-Based Learning Model

The advantages of using the PjBL model (Sitorus & Harahap, 2019:78), include: “(1) improving students' skills; (2) provide learning experiences to students; (3) involving students in learning; (4) increase motivation; (5) a pleasant learning atmosphere; (6) improve problem solving ability; (7) make students more active; (8) enhance collaboration; (9) provide encouragement for students in developing and practicing communication skills. The drawbacks of this project-based learning are that it requires an educator who is competent and has a desire to learn; requires a lot of time and money; require adequate facilities and infrastructure; this model is not suitable for students who are easily discouraged, do not have the knowledge and skills; it is difficult to involve students in group work” (Nahdiah, 2021, p. 2382).

Based on the research that has been done, one of which is in a study conducted by Hikmatul Fitri, I Wayan Dasna, and Suharjo entitled The Effect of Project Based Learning (PjBL) Models on Higher-Level Thinking Ability in terms of Achievement Motivation of Grade IV Elementary School Students. The results obtained can be concluded, namely, (1) there is a significant effect of the implementation of the Project Based Learning (PjBL) Model on the Higher-Order Thinking Ability of Grade IV Elementary School Students, (2) there is a significant influence of Achievement Motivation on the Higher-Level Thinking Ability of Grade IV Students. SD, and (3) there is a significant effect of implementing the Project Based Learning (PjBL) Model on Students' Higher Order Thinking Ability in terms of Achievement Motivation of Fourth Grade Elementary School Students (Hikmatul Fitri, 2018, p. 209).

Meanwhile, in research conducted by Ni Made Risa Kusadi, I Putu Sriartha, and I Wayan Kertih in their journal entitled "Project Based Learning Models on

Social Skills and Creative Thinking" it can be concluded that there is an effect of project-based learning models on students' creative thinking skills. This is evidenced by statistical data processing which shows that there are differences in students' creative thinking skills between groups of students who study with project-based learning models and groups of students who study with conventional learning models. $F_{count} = 10.241$ ($p = 0.002 < 0.05$) (Ni Made Risa Kusadi, 2020, p. 26).

Based on the description above, it can be concluded that the Project based learning model is one of the learning models that can improve students' higher order thinking skills (HOTS) in elementary schools.

C. Concluding Remarks

Based on the results of the study, it can be concluded that the learning model with the Discovery/Inquiry Learning model presents the concept to create learning oriented to students' thinking activities. Thus, it is hoped that the Discovery/Inquiry Learning model can improve critical thinking skills and student learning outcomes. The application of the Problem Based Learning model is in accordance with the level of cognitive development and also the characteristics of elementary school students. Elementary students are able to think systematically through concrete objects or solve real problems. While project-based learning (PjBL) applies the concept of "Learning by Doing" namely the process of obtaining learning outcomes by doing certain actions according to their goals, especially children's mastery of how to do a job which consists of a series of behaviors to achieve a goal.

Judging from the application of the three learning models, Discovery/Inquiry Learning, Problem-based Learning, and Project-based Learning, it has been proven effective to increase HOTS in elementary school students. This can be used as a reference for education practitioners, especially elementary school teachers in choosing an effective learning model to improve higher order thinking skills (HOTS).

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