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The Implementation of Higher Order Thinking Skill (HOTS) oriented Learning through Project Based Learning Model (PjBL) in Elementary Schools

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Abstract: Higher Order Thinking Skills (HOTS) is a much-needed ability for the younger generation to face the era of society 5.0. This skill will make a person have critically and creatively abilities, more adaptive in all conditions, and trained to face various types of problems. But, the results of PISA show that HOTS of Indonesian students is low. Based on these conditions, this study aims to describe the implementation of Higher Order Thinking Skill (HOTS) oriented learning through Project Based Learning Model (PjBL) to Mathematics Subject at SDN Tlogoanyar. This study is descriptive qualitative research. Data collection techniques used in this study is observation, interviews, and documentation. Data validity used the triangulation of sources and methods. The data analysis techniques used data collections, data reduction, data presentation, and make a conclusion. The results showed that; 1) the planning and implementation of project based learning had gone well. 2) The selection of learning component has been involved in HOTS learning atmosphere improvement. 3) Authentic assessments have used in project based learning. 4) The obstacles on the implementation of project based learning by teacher are: teachers have difficulty in determining the appropriate teaching materials and learning media, teachers do not have time to redesign lesson plan, and teacher difficulty in dividing the time allocation. While the obstacles factor by students are: decreasing learning concentration, lack of learning motivation, and low willpower to learn, and lack of creativity.

Keywords: Higher Order Thinking Skill (HOTS), Project Based Learning (PjBL), Elementary School

INTRODUCTION

The development of the industrial era 4.0 is a challenge for the world of education today, including basic education (elementary school). The world of education has not finished being affected by the industrial revolution 4.0, the trend of society 5.0 has emerged or is called society 5.0. According to Andreja, the Industrial Revolution 4.0 and Society 5.0 are real movements towards the development of increasingly sophisticated information and technology (Rojko, 2017). The concept of Society 5.0 was adopted by the Japanese government in anticipation of global trends as a result of the emergence of the industrial revolution 4.0 (Umro, 2020). Society 5.0 is the answer to the challenges that arise as a result of the era of the industrial revolution 4.0 accompanied by disruption marked by a world full of turmoil, uncertainty, complexity and ambiguity (Umro, 2020).

Through curriculum changes, the world of education tries to adapt to the times. This is in line with Samsul Bahri's statement that the direction and objectives of the educational curriculum will change along with the dynamics of social change, because of its dynamic nature in responding to change, the curriculum must absolutely be flexible and futuristic

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(Bahri, 2017). Based on this statement, curriculum changes are absolutely necessary, not just made up as a government project.

Currently the applicable curriculum in Indonesia is Kurikulum 2013 and Kurikulum Merdeka. In the Kurikulum 2013 each lesson is more directed at using a scientific approach. This approach prioritizes the process of constructivism, where students are required to be active during the learning process (Mahsun, 2014). In the implementation process, the 2013 curriculum continues to change. These changes are contained in the Regulation of the Minister of Education and Culture (Permendikbud) No. 22 of 2016. Learning based on the Kurikulum 2013 must integrate literacy skills, 4C (Critical Thinking and problem solving, communication, collaboration, creativity and innovation), and Higher Order Thinking Skills (HOTS) as 21st century learning challenges (Permendikbud, 2016). Meanwhile, Kurikulum Merdeka places more emphasis on students' ability to observe the surrounding environment in the learning process. So that the concept is compatible with HOTS where students are expected to be accustomed to solving problems and being able to make the best solutions based on their knowledge. Through the concept of implementing the two systems can form adaptive students. Adaptive skills allow students to explore something more so that students can deal with various problems (Damayanti & Muhroji, 2022).

Higher Order Thinking Skills (HOTS) are the ability to think strategically to use information in solving problems, analyzing arguments, negotiating issues, or making predictions (Sani, 2019). The main objective of high 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, to think creatively in solving a problem using the knowledge they have and to make decisions in complex situations (Saputra, 2016).

Higher Order Thinking Skills (HOTS) must be reflected in the learning and assessment process. The teaching taxonomy and assessment of higher order thinking skills are found in Bloom's taxonomy revised by Anderson and Krathwohl. In Bloom's taxonomy, the three cognitive domains that are part of higher-order thinking skills are analyzing (C4), evaluating (C5), and creating (C6).

SDN Tlogorejo is one of the schools that applies the concept of higher order thinking skills to its learning and assessment. Based on the results of pre-research observations and interviews, it is known that all components at SDN Tlogorejo strongly support the implementation of HOTS-based learning. Schools have attempted to develop teacher competencies to master the design and implementation of HOTS-based learning through discussions, training, workshops, seminars, implementing literacy culture, and implementing project based learning. Even though conceptually the teacher is able to apply it, sometimes some obstacles result in learning not being carried out optimally.

Related to this background, this study aims to describe the implementation of Project Based Learning Model (PjBL) to improved Higer Order Thinking Skill (HOTS) in SDN Tlogoanyar. Then the formulation of the problem in this study is: 1) how is PjBL implemented to improved Higer Order Thinking Skill (HOTS) in SDN Tlogoanyar? 2) what are the hots components in implementing PjBL in SDN Tlogorejo?3) 1) how is the PjBL assessment to improve HOTS in SDN Tlogorejo? 4) what are obstacle factor to implementing PjBL in SDN Tlogoanyar?

This research has relevance to previous research, namely: 1) research by Suherman, et al (2020) entitled "Improving Higher Order Thinking Skills (HOTS) with Project Based Learning (PjBL) Model Assisted by Geogebra". This study shows that learning can achieve the desired goals, the teacher must plan learning well, and the PjBL model can be made as a learning solution in the 21st century (Suherman et al., 2020), 2) research by Rifda Eliyasni (2019) with the title "Blended Learning and Project Based Learning: The Method to Improve

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Students' Higher Order Thinking Skills (HOTS)". This research implied using Blended Learning and Project Based Learning Model was an alternative to improve Higher Order Thinking Skills (HOTS) (Eliyasni et al., 2019), 3) Uhame Binti Harun's research (2019) entitled "Project-Based Learning Integrated To STEM (STEM-PjBL) to Enhance Arabic Learning Hots-Based". This study shows that the STEM-PjBL learning model is a learning model that can improve students' higher-order thinking skills (HOTS) (Harun, 2020). The difference between previous research and this research lies in the type of research and research focus. The three studies above discuss the effectiveness of the Project Based Learning (PjBL) Model to improve Higher Order Thinking Skills (HOTS) based on literature studies and experimental research. Meanwhile, this research uses a qualitative descriptive research method to explain the implementation of PjBL in learning, including: planning, implementation, and evaluation. It also describes the inhibiting factors for PjBL implementation. However, the two studies have the same research object, namely studying learning at the elementary school level.

METHODS

This research learn about the subjects' behavior, perceptions, and experiences in implementation of Higher Order Thinking Skill oriented through Project Based Learning Model (PjBL) to Mathematics Subject at SDN Tlogoanyar . This study used qualitative approach with descriptive method. Qualitative descriptive method is one of research methodology that used to examine the state of a nature object by studying something to the fullest with the aim of describing, explaining, and answering in detailed problems (Sugiyono, 2020).

This research was carried out at SDN Tlogorejo Lamongan academic year 2022/2023. Data sources used in this study were learning events, informants' statements, and documents in the form of syllabi, lesson plans, and teaching materials. Informant used included homeroom teacher, curriculum heads and school principals. Data collection techniques used in this study is observation, interviews, and documentation. Data validity used the triangulation of sources and methods. The data analysis techniques used data collections, data reduction, data presentation, and make a conclusion.

RESULT AND DISCUSSION

1. **The implementation of HOTS oriented learning through Project Based Learning (PjBL) Model**

   The implementation of HOTS oriented learning through Project Based Learning (PjBL) Model in Mathematics subjects at SDN Tlogorejo Sukodadi Lamongan consists of three development steps, namely planning, implementation, and assessment. The description of the three steps of learning PjBL, which is as follows:

   a. Planning of HOTS oriented learning through Project Based Learning (PjBL) Model

   Developing a lesson plan is the first step that must be prepared by teachers before teaching in class. Planning includes determining learning objectives, determining the material to be taught, choosing appropriate approaches, strategies, learning models and methods, determining relevant learning resources, choosing suitable media or learning aids, designing learning techniques, and planning the form and technical evaluation of learning. The entire planning is carried out to get a

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complete picture of the learning process to be carried out. Details of the lesson plan in schools will be contained in the form of RPP (Learning Implementation Plan).

Based on the results of the study, RPP was prepared with the format and rules of the 2013 Curriculum and refers to the syllabus. In the revised 2013 curriculum, the preparation of the syllabus is the authority of the central government, except for certain subjects developed explicitly in the education unit concerned. Thus, teacher authorities only develop lesson plans based on the syllabus, teacher manual, and student manual prepared by the government. The RPP used at SDN Tlogorejo is a modification of the RPP from MGMP (Musyawarah Guru Mata Pelajaran) throughout Lamongan Regency. Modifications are made to adjust planning to student characteristics, teacher abilities, and the availability of infrastructure in each education unit. The following are the steps teachers take in planning lessons:

First, teachers study the syllabus that has been provided by the central government to analyze several aspects, including: learning objectives consisting of Kompetensi Inti (KI) and Kompetensi Dasar (KD), subject matter, learning process, learning assessment, time allocation, and learning resources. Kompetensi Inti (KI) consist of: KI 1 about the affective aspect which is spiritual attitudes, KI 2 about the affective aspect which is social attitudes, KI 3 about the cognitive aspect, and KI 4 about the psychomotor aspect.

The second step is the Kompetensi Dasar (KD) analysis to identify the types of competencies that can be directed to the application of the HOTS-oriented Project Based Learning Model. The way teachers identify KD that is appropriate for HOTS-oriented PJBL is by identifying verbs in KD that demand higher-order thinking skills (HOTS), such as analyzing (C4), evaluating (C5), and creating (C6) or other equivalent words. So that it can be designed into the form of a project.

The third step is to draw up indicators. Indicators are derivatives of Kompetensi Dasar (KD) which are used as a reference for the preparation of learning objectives. The indicators that teachers think contain operational verbs that describe the competencies to be achieved in learning. In this HOTS-oriented PjBL learning, the operational verbs chosen are part of C4, C5, and C6.

The fourth step is to formulate learning objectives. Learning objectives are an important part of lesson planning. All learning activities will be directed to achieve learning objectives. Teachers at SDN Tlogorejo develop learning objectives from pre-compiled indicators by completing ABCD elements, namely audience (A), behavior (B), conditions (C), and degrees (D). Audience (A) is the subject or target of the activity, that is, the student. Behavior (B) is an activity that can be demonstrated by the audience after following the learning process. In determining behavior should be as specific as possible and avoid words that are difficult to measure, such as knowing, understanding, etc. The verbs used are operational verbs. To determine this verb, the teacher refers to bloom's taxonomy. Condition (C) refers to the condition of the student in order to achieve targeted behavior. This condition can be interpreted as a stimulus for students. Usually this condition is given in the form of nouns that can help participants in achieving the behavior to be achieved. Degree (D) is a measure of the achievement of learning objectives. It is concerned with the second element, behavior. In the second element it is emphasized that the determination of verbs must be specific and measurable. In this section, more is explained the measurement standard. All components of learning objectives are directed at carrying out activities that are in accordance with the characteristics of

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the HOTS-oriented PjBL model, which involves creativity and problem-solving activities through projects.

The fifth step is the determination of the subject matter and the development of teaching materials. At this stage, the teacher determines the subject matter, compiles material details in the form of facts, concepts, principles, and procedures, determines learning aids in the form of appropriate learning media or teaching aids, and plans learning resources that will provide all the information needed in achieving learning objectives. For teachers, almost all mathematical material can be related to real life, thus fitting into the PjBL Model. Here the role of the teacher is very important in providing varied learning resources, compiling interesting problems or problem solving materials that require students to think higher-order, and designing projects related to material that students can do individually or in groups. Examples of mathematical materials designed with HOTS-oriented PjBL are geometry and building space materials. In the material, the teacher asked students to design a building that involves various elements of geometry, build flat and build space. Then students were asked to explain the design by mentioning the building components, building area, and many materials needed.

The sixth step is to plan learning activities. At this stage the teacher designs learning steps consisting of pre-learning activities, initial or opening activities, core activities, and final or closing activities. Based on the results of RPP analysis, the learning steps prepared by teachers have systematically referred to the syntax of the project-based learning model (PjBL). The methods used also vary, indicating that teachers are innovative in planning learning activities. Project Based Learning steps planned by the teacher, including (1) dividing students into heterogeneous groups, (2) providing LK containing questions to each group; (3) students discuss answering questions; (4) students create project designs; (5) teachers conduct results assessments; (6) presentation as well as evaluation.

The seventh step is to determine the allocation of time. Based on the RPP analysis, the time division between the opening activities, core activities, and closing activities is proportional. This shows that teachers are not only concerned with core activities, but also maximize opening and closing activities.

The eighth step is to structure a learning assessment. Assessment in Kurikulum 2013 uses authentic assessment, including assessment of cognitive, affective, and psychomotor. The results showed that teachers planned assessments according to learning objectives and covered all of three domains (cognitive, affective, and psychomotor). The assessment instruments are designed according to the characteristics of the PjBL Model, namely process and product-based assessment. Process assessment is carried out by teacher observation and peer assessment, while product assessment is carried out through product portfolios and presentations, by setting criteria that are in accordance with learning objectives and HOTS indicators.

b. Implementation of HOTS oriented learning through Project Based Learning (PjBL) Model

Gage and Berliner suggest that there are three roles of teachers in the learning process, namely: Teachers as planners who must design and prepare everything related to the teaching and learning process (pre-teaching problems), Teachers as implementers (organizers) who must be able to direct teaching and learning activities according to plan, manage classes well, create a positive learning climate, motivate students, act as a source of learning, and become a leader during learning.

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Teachers as evaluators who must collect, analyze, interpret and give consideration (judgment), on the success rate of the learning process based on established criteria, both regarding aspects of the effectiveness of the process and product qualifications (Makmun, 2003).

At the learning implementation stage, teachers apply the lesson plans that have been prepared before. Based on the results of the study, teachers act alone in implementing lesson plans with an allocation of time for 2x35 minutes. Learning is carried out in accordance with the stages in planning. However, the time allocation has not been as planned.

Activities during the learning process lead students to develop critical thinking, creativity, problem-solving, and decision-making skills. Critical thinking activities are seen when students are discussing with their groups to complete projects. In these activities, each group member is very active in providing opinions and input. The critical attitude of students is also seen when they present their work. Other group members provide feedback and suggestions to the results of the group's work presentation. The presenting group also does not want to be dropped; they defend their opinions with strong arguments. Creative thinking skills are used when students are asked to complete a project to create a product or work in groups. The resulting work is a fusion of the ideas of all members of the group, thus fulfilling original and new elements, although some are other forms or modifications of what already exists. As Kaufman & Sternberg argue, creative thinking skills are an activity of thinking and acting in an unconventional way accompanied by the desire to achieve a dream, so as to produce original and new ideas (Kaufman, 2010). Problem solving skills are seen when all groups are able to complete the project tasks assigned by the teacher appropriately. This shows that they are able to capture the purpose of the tasks described on the Worksheet (LKS), combine various ideas and opinions, to decide the answer to the problem presented. This process trains students to use the power of reason in problem solving and decision making.

In Dewey's view, thinking does not happen spontaneously but must be raised by "problems and questions" or "some confusion and doubt". The use of these skills results in explanations, decisions, performances, and products that apply in the context of available knowledge and experience and encourages the improvement of these skills as well as other intellectual skills (Hidayah, 2015). This opinion explains that higher-order thinking skills do not present themselves, but rather must be trained and familiarized through problem-solving-oriented activities, such as this PjBL learning model.

c. Evaluation of HOTS oriented learning through Project Based Learning (PjBL) Model

Learning evaluation is an activity carried out by teachers in the context of controlling, guaranteeing and determining the quality (value and meaning) of learning on various learning components based on certain considerations and criteria (Arifin, 2012). Based on the results of the study, it is known that the form of evaluation carried out by teachers consists of process assessment and assessment of results. Process assessment is carried out during learning with direct observation methods by teachers, by looking at aspects of activeness, participation, responsibility, discipline, and cooperation both individually and in groups. Process assessment includes cognitive, affective, and psychomotor domains. Meanwhile, the assessment of results is carried out on products made by students in groups through PjBL using portfolio assessment. This assessment is carried out in stages, starting

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from the idea planning stage to product creation and product presentation. Aspects assessed on the products include: creativity, the level of difficulty or complexity of the work, and accuracy in using theories and formulas.

The assessment procedures shown by the teacher have met the criteria for authentic assessment. As Kusaeri argues, authentic assessment is an assessment that requires students to demonstrate the knowledge and skills they have mastered. The demonstration of such knowledge and skills comes from a given task, in the form of a problem analogous to a real problem (Kusaeri, 2014).

2. The Obstacles on the Implementation of HOTS-oriented PjBL Learning

The implementation of HOTS-oriented PjBL learning in mathematics subjects at SDN Tlogoanyar has gone well. However, there are still some obstacles that affect the success of the learning process. The obstacles that arise come from teachers and students. Based on the results of the study, the constraints of teachers are in the stages of planning, implementing, and evaluating learning. At the planning stage, teachers have difficulty in determining the appropriate teaching materials and learning media. RPP from the MGMP forum deliberations that should be adjusted to the conditions of the education unit, sometimes teachers do not have time to redesign. So that it is directly applied in learning. At the implementation stage, teachers find it difficult to implement time allocation according to the lesson plan. Meanwhile, at the evaluation stage, sometimes teachers do not have time to follow up on the assessment results. While the obstacles that arise come from students include: rapidly decreasing learning concentration, lack of learning motivation, and low willpower to learn. This has an impact on the low quality of products produced by students.

CONCLUSIONS

Based on findings and discussion of implementation Project Based Learning Model (PjBL) to improve students Higher Order Thinking Skill (HOTS) in SDN Tlogorejo, it can concluded that: 1) the planning and implementation of project based learning had gone well. In the planning step, teacher has designing a lesson plan or Rencana Pelaksanaan Pembelajaran (RPP) based on the 2013 curriculum. In the implementation step, the plan will adapted based on students' condition. 2) The selection of learning component has been able to improve a HOTS learning atmosphere. The learning steps taken by the teacher have reflected HOTS aspects which include critical thinking skills, problem-solving, creativity, and making decisions. The success of the process is supported by implementation Project Based Learning model and selection of appropriate learning methods, learning media, and learning resources. 3) Authentic assessments have used in project based learning. Forms of assessment consist of process and result. The assessment process use observation instrument to reflect student behavior. While result assessment used to examine product of project, 4) The obstacles on the implementation of Project Based Iearning by teacher are: teachers have difficulty in determining the appropriate teaching materials and learning media, teachers do not have time to redesign lesson plan, and teacher difficulty in dividing the time allocation. While the obstacles factor by students are: decreasing learning concentration, lack of learning motivation, and low willpower to learn, and lack of creativity.

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REFERENCES

Bahri, S. (2017). Pengembangan Kurikulum Dasar Dan Tujuannya. *Jurnal Ilmiah Islam Futura*, *11*(1), 15. https://doi.org/10.22373/jiif.v11i1.61

Damayanti, G. A., & Muhroji, M. (2022). The Difficulties of Elementary School Teacher in Developing Thematic Learning Tools for the Merdeka Curriculum. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *8*(3), 703. https://doi.org/10.33394/jk.v8i3.5770

Eliyasni, R., Kenedi, A. K., & Sayer, I. M. (2019). Blended Learning and Project Based Learning: The Method to Improve Students' Higher Order Thinking Skill (HOTS). *Jurnal Iqra' : Kajian Ilmu Pendidikan*, *4*(2), 231–248. https://doi.org/10.25217/ji.v4i2.549

Harun, U. B. (2020). Project-Based Learning Integrated To Stem (Stem-Pjbl) To Enhance Arabic Learning Hots-Based. *Al-Bidayah: Jurnal Pendidikan Dasar Islam*, *12*(1), 139–150. https://doi.org/10.14421/al-bidayah.v12i1.230

Hidayah, N. (2015). Mengasah Keterampilan Berpikir Kritis dan Kreatif. *Prosiding Seminar Nasional Bimbingan Dan Konseling PD ABKIN Jawa Timur*, *1*(2), 49–61.

Kaufman, J. C. and R. J. S. (2010). *The Cambridge Handbook of Creativity*. Cambridge University Press.

Kusaeri. (2014). *ACUAN & TEKNIK PENILAIAN PROSES & HASIL BELAJAR DALAM KURIKULUM 2013*. Ar Ruzz Media.

Mahsun. (2014). *Teks Dalam Pembelajaran Bahasa Indonesia: Kurikulum 2013No Title*. Raja Grafindo Persada Press.

Makmun, A. S. (2003). *Psikologi Pendidikan*. Rosda Karya Remaja.

Permendikbud. (2016). *Permendikbud Menteri Pendidikan dan Kebudayaan Nomor 22 Tahun 2016*. *53*(9), 1689–1699.

Rojko, A. (2017). Industry 4.0 concept: Background and overview. *International Journal of Interactive Mobile Technologies*, *11*(5), 77–90. https://doi.org/10.3991/ijim.v11i5.7072

Sani, R. A. (2019). *Pembelajaran Berbasis HOTS Edisi Revisi: Higher Order Thinking Skills*. Tira Smart.

Saputra. (2016). *Pengembangan mutu pendidikan menuju era global: Penguatan mutu pembelajaran dengan penerapan HOTS (High Order Thinking Skills)*. SMILE's Publishing.

Sugiyono. (2020). *Metode Penelitian Kualitatif*. Alfabeta.

Suherman, Prananda, M. R., Proboningrum, D. I., Pratama, E. R., Laksono, P., & Amiruddin. (2020). Improving Higher Order Thinking Skills (HOTS) with Project Based Learning (PjBL) Model Assisted by Geogebra. *Journal of Physics: Conference Series*, *1467*(1). https://doi.org/10.1088/1742-6596/1467/1/012027

Umro, J. (2020). *3675-Article Text-9889-1-10-20200401*. *5*(1), 79–95.