



Implementation of Hots-Based Learning and Problem Based Learning during the Pandemic of COVID-19 in SMA Budi Mulia Jakarta

Sarwedi Sirait

Educational Management, Postgraduate Program
Universitas Kristen Indonesia

Erni Murniarti

Educational Management, Postgraduate Program
Universitas Kristen Indonesia

Hotmaulina Sihotang

Educational Management, Postgraduate Program
Universitas Kristen Indonesia

ABSTRACT

The implementation of the 2013 curriculum requires teachers to change their views in implementing learning process in schools. Learning strategies are no longer teacher-centered learning but learner-centered learning. Teachers are required to organize creative and innovative learning as stated in the Lesson Plan. Teachers must master various methods to improve higher-order thinking skills (HOTS) of students. In this context, Problem Based Learning (PBL) is the appropriate model in developing students' thinking skills. The 2013 curriculum has adopted Bloom's taxonomy which was revised by Anderson starting from the level of knowing, understanding, implementing, analyzing, evaluating and creating. Because the demands of the 2013 Curriculum must be at the level of creating, students must be continuously trained to produce something new. This study aims to describe the Problem Based Learning (PBL) learning method as a model of effective way to build critical and creative thinking skills of students at SMA Budi Mulia Jakarta. This study also explains HOTS-based assessment as a logical assessment of PBL learning.

Key words: Problem Based Learning (PBL), HOTS, learning proces.

INTRODUCTION

The obligation of the educational unit to educate the nation's children to become creative and capable human beings is explicitly stated in Article 3 of the Law of the Republic of Indonesia concerning the National Education System, namely: "National education functions to develop capabilities and shape the character and civilization of a nation with dignity in order to educate

the nation's life, aims to develop the potential of students so that they become human beings who believe and obey God Almighty, have noble character, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. " One of the elements of the 2013 curriculum transformation at the educational unit level and one of the efforts to achieve the educational goals above is to strengthen the learning process using a scientific approach and familiarize the development of higher order thinking skills (HOTS). In this case the teacher is an important part of implementing HOTS-oriented learning to invite students to think creatively and critically. The current challenge is how to apply learning with a scientific approach and HOTS-based assessments online during the Covid-19 pandemic.

According to Krathworl in Merta Dhewa Kusuma, Undang Rosidin, Abdurrahman, Agus Suyatna, (2017) states that indicators for measuring higher-order thinking skills include: analyzing, evaluating, and creating. Thus, HOTS is a thinking skill that not only requires the ability to remember, but also other higher abilities including the ability to analyze, evaluate, and create.

Furthermore, according to (Murniarti: 2017) Project Based Learning aims to find solutions of problems, besides that, students learn the concept of how to solve problems and develop critical thinking skills. In learning the concepts and critical thinking skills, students work together in groups to study real problems. Learning by applying this learning method is expected to make students more active and creative, by learning from what they see from their environment. According to (Risky Priliani, 2019) Problem-Based Learning helps students transfer factual knowledge to understand contextual problems related to the concept of the material to be studied, can improve students' thinking skills, and can develop student responsibility to become independent learners. According to (Ikman, 2016) Through the PBL model students also learn to be responsible in learning, not only passively receiving information, but must actively seek the information needed according to existing abilities. According to (Siti Juleha, 2019) The application of the Problem Based Learning model in learning activities also provides opportunities for students to collaborate with other groups in conducting investigations, so that they can develop the learning process and their social skills. According to (Sulistiyani, 2018) to realize enthusiasm, critical attitude, and concern for others, it can be done by applying the right learning model, one of which is PBL (Problem Based Learning). In PBL, students are faced with a problem that stimulates students to analyze problems, estimate their answers, search for data, analyze data, and summarize answers to problems. Thus, problem-oriented learning by itself will train students to think critically.

The Problem Based Learning model has a significant effect on increasing students' analytical thinking skills in the Basic Competencies of Making Meeting Plans or Meetings. Thus the implication of the results of this study is that efforts to improve analytical thinking skills can be done through the application of the Problem Based Learning model (Assegaf, 2016). Through the application of the problem-based learning model in learning repair material and resetting the PC in this study, it can improve students' critical thinking skills in learning (Nafiah, 2014). The PBL model is a learning approach that emphasizes scientific learning, (Fauziah, et al, 2017) where students are required to be active in obtaining concepts by solving problems. Through the problems presented by the teacher, students use their scientific reasoning abilities to develop an experiment which includes the ability to formulate problems, make hypotheses, determine variables, design experiments, analyze data, and make conclusions based on data. These skills can be trained by teachers by applying inquiry-based learning, one of which is Problem Based Learning. Because given problems and then students are required to

solve them, students' scientific reasoning will develop (Shofiyah, 2018). Problem-based learning is an educational technique that employs real world problems, scenarios and cases in order to enhance the problem solving and critical thinking skills of students (Ardeson, 2020). PBL is a good alternative teaching method to improve student academic achievement. For that, students need to develop their social skills to be active in group discussions and carry out independent learning. There must also be a sense of trust among students (Argaw, 2016), meaning that PBL with the help of social media is more effective than conventional models for teaching statistics. These results were supported by a questionnaire that showed mathematics learning through PBL with the help of social media received a positive response from students (Yuliana, 2018).

Budi Mulia Private High School is located on Jl. Raya Mangga Besar No.135, Mangga Dua Selatan., Sawah Besar District, Central Jakarta City, Postal Code, 10730. This school is managed under the auspices of the Budi Mulia Lourdes Foundation, which is based on Jl. Gunung Sahari No. 91, Central Jakarta. In the learning process in the classroom, Budi Mulia high school has applied a scientific approach and familiarized the development of higher order thinking skills (HOTS) to students. This is clearly stated in the Lesson Plan. Recently, the Indonesian Ministry of Education and Culture introduces a program which is called "Merdeka Belajar". In this case, the learning is formulated by the teacher as a reference for learning in the classroom. The learning orientation becomes broader and open to various ideas, ideas and logical arguments. Learning and assessment is not only about memorization and understanding, but focuses more on building the ability to analyze, evaluate, and create.

The purpose of this discussion is to describe the implementation of learning using the Problem Based Learning (PBL) scientific approach and familiarize the development of higher order thinking skills (HOTS) to students as stated in the 2013 Curriculum. SMA Budi Mulia as a private school uses the 2013 Curriculum as a learning reference. In this context, Problem Based Learning (PBL) is the model of choice in developing students' thinking skills.

DISCUSSION

However, the Indonesian Ministry of Education and Culture has established several major policies regarding changes in the management system for education and teaching in primary and secondary education, including:

Learning Implementation Plan

Through a policy he calls "Free Learning", Minister Nadiem will simplify the preparation of a Lesson Plan. Some components will also be trimmed. Teachers will have the freedom to choose, make, use, and develop lesson plans format. The three core components of the lesson plan consist of learning objectives, learning activities, and assessment. The format of the Lesson Plan is streamlined. Teachers are free to choose, make, use and develop lesson plans format. The Lesson Plan contains learning objectives, learning activities and assessments. The lesson plan (RPP) is only 1 page. Writing a Lesson Plan is done efficiently and effectively which gives the teacher time to prepare and evaluate the learning process itself.

Change Concept of School Exams.

Nadiem said, by maintaining the multiple choice school examination system, it will close the self-development of students. However, schools must innovate to change the concept of the School Examination in the program of Merdeka Belajar. This program provides flexibility for schools that are ready to undertake the concept of new School Exam assessments.

Change UN Starting 2021

The Ministry of Education and Culture Nadiem Makarim will replace the national exam (UN) with national assessment (AN) consisted of literacy and numerical minimum competency Assessment and character survey. The abolition of the National Examination will be effective in 2021. However, a number of new things in the assessment system to replace the 2020 UN with School Exams have begun to be applied due to the conditions of the Covid-19 pandemic that has hit the world until now. The policy of independent learning makes educators more prerogative in assessing student learning outcomes. The independent learning policy measures student success based on the Minimum Competency Assessment and Character Survey. The minimum competence of students is measured from the aspects of literacy and numeracy. The students who carry out the competency assessment are students who are in the middle school level (namely grade 4 for Elementary School level, grade 8 for Junior High School level and grade 11 for Senior High School).

Responding to the three policies of the Ministry of Education and Culture above, SMA Budi Mulia began to make several adjustments in the learning tools starting from simplifying the Lesson Plan which focuses on achieving the basic competencies of each subject using scientific methods. Learners are trained to be able to think critically and logically by building reasonable arguments. In this context, the absolute truth of the teacher becomes less relevant and the teacher is not the only source of learning for students. Students can explore on the internet to deepen learning material and relate it to real-life problems in context. Science must be able to answer every real problem in concrete life; present practical and meaningful solutions. HOTS learning model and Problem Based Learning (PBL) are the models of choice in developing students' thinking skills. Budi Mulia High School continues to encourage teachers to change their thinking with new perspectives, from conventional learning to learning with a scientific approach. Kemendikbud (2013) suggests scientific skills in a scientific approach, namely 5M activities: 1) observing; 2) ask; 3) Gathering Information / Experiments; 4) associating / processing information / reasoning; 5) communicate. The teacher acts as a facilitator, arranges / directs learning activities, provides feedback, provides explanations, and provides confirmation.

Higher Level Thinking Skills (HOTS)

1) Critical Thinking Ability

One of the skills in the 21st century skills is critical thinking. Thinking has meaning as a process that produces new mental images by transferring knowledge and information that involves complex interactions such as judgment, reasoning and problem solving. Critical thinking is a process that centers or leads to making and drawing logical conclusions or decisions about what actions to take and what to believe or believe. Critical thinking is the ability to produce a picture to analyze specific ideas or ideas by studying relevant knowledge about the world and involves evaluating evidence. The ability to think critically is needed in analyzing a problem until it reaches the problem solving stage when facing a problem.

2) Implementation of HOTS Learning at Budi Mulia High School

It cannot be denied that some teachers at SMA Budi Mulia Jakarta still use a conventional approach in their learning. Of course, this approach model is no longer relevant to be applied in the current digital era. The conventional approach is characterized by teachers teaching more about concepts not competencies, the goal is that students know something is not able to do something and during the learning process students listen more.

At the beginning of the odd semester of the 2020/2021 school year, Budi Mulia High School began to implement HOTS-oriented learning. The teacher becomes a facilitator to manage learning that inspires students' reasoning, not just memorizing or understanding theoretical concepts alone in each subject, but must arrive at the stage of analyzing and concluding.

Problem Based Learning Model (PBL)

One of the learning models recommended in the 2013 Curriculum that can be used to improve HOTS is problem based learning (PBL) (Weissinger, 2004; Arends, 2012). Problem-based learning is a learner-centered learning approach that organizes curriculum and learning in unstructured situations and provides real-world problems (Mergendoller, Maxwell & Belissimo, 2006). The application of the PBL learning model can make students more active. This is because in PBL students are involved in formulating problems, analyzing problems, formulating hypotheses, and concluding solutions to these problems.

PBL is learning that exposes students to real world problems to start learning. Problems are given to students, before learning the concept or material with respect to the problem to be solved. Thus, to solve these problems students will know that they need new knowledge that must be learned to solve the problems given. The advantages of the Problem Based Learning (PBL) Model, Sudrajat (2011) suggested several advantages of this problem based learning model, namely: 1) Students better understand the concepts being taught because they themselves invented the concept; involving them actively in solving problems and demands their higher thinking skills. 2) Knowledge is embedded based on schemata owned by students so that learning is more meaningful. 3) Students can feel the benefits of learning because the problems that are solved are directly linked to real life, this can increase students' motivation and interest in the material being studied. 4) Make students more independent and mature, able to give aspirations and receive opinions from others, instill a positive social attitude among students. 5) Conditioning of students in group learning that interacts with each other and their friends so that the achievement of students' completeness can be expected. 6) In addition, Problem Based Learning (PBL) is also believed to be able to foster the creativity skills of students, both individually and in groups.

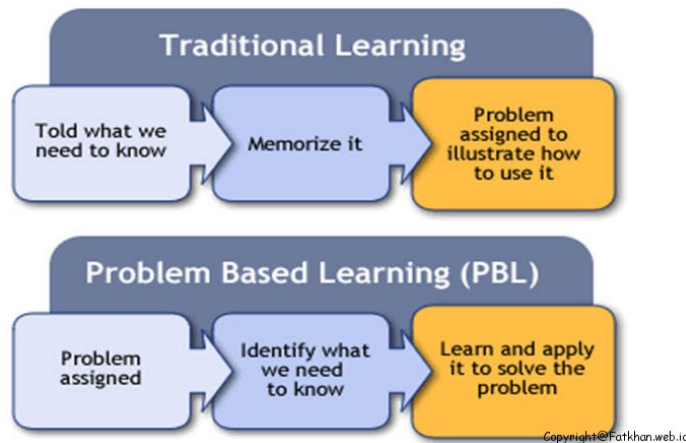
The Steps of the Problem Based Learning

The steps for the Problem Based Learning (PBL) model are divided into two phases, namely:

Phase 1: Student orientation to the problem, the teacher explains the learning objectives, explains the important equipment needed, motivates students to be involved in the problem solving activities they choose.

Phase 2. Organizing students to learn, the teacher helps students define and organize learning tasks related to the problem. The following is a schematic of the difference between traditional

learning and problem / case based learning. The scheme of Problem Based Learning can be seen as follows:



Scheme: Problem Based Learning

Example of Scientific approach-based Lesson Plan and HOTS

LESSON PLAN

School Name : SMA BUDI MULIA JAKARTA	Grade/Semester : X /Even
Subjects : Biology	Meeting : 4, 5, 6
Material : Virus	Time Allocation : 135 Minutes/meeting

A. LEARNING OBJECTIVES

After participating in learning activities, it is hoped that students will be able to identify, explain, analyze, present, and solve problems related to the role of the virus in life and youth participation in preventing the spread of the HIV virus.

B. LEARNING STEPS

PRELIMINARY ACTIVITIES	
<ul style="list-style-type: none"> • Opening with greetings and prayer. • Delivering indicators and learning objectives at today's meeting. • Give an apperception about the importance of injecting Measles in human infants 	
MAIN ACTIVITY	
Stimulus	Students are given motivation or stimulation to focus on material topics: The role of the virus in life and the participation of youth in preventing the spread of the HIV virus
The orientation of students on the problem	The teacher gave an example of a case, namely the Danger of the Covid-19 Virus on Human Health to students using journals and news. Students are guided to identify the problem individually then ask to write down the information obtained.
Organizing	• Teachers and students form heterogeneous groups.

students	<ul style="list-style-type: none"> • The teacher provides Student Worksheet on the role of viruses in life, for example on Vaccines and AIDS. Then students are asked to collaborate to solve the problems given. • The teacher provides assistance to students who have difficulties and provides opportunities for students to ask questions that have not been understood.
Guiding individual and group investigations	<ul style="list-style-type: none"> • The teacher asks students to see relationships based on the information obtained in the group. • The teacher asks students to work on several questions regarding the material: Vaccines and AIDS. • The teacher asks students to discuss the answers to the questions given.
Developing and Presenting the Work	<ul style="list-style-type: none"> • The teacher asks students to prepare reports on the results of group discussions neatly, in detail, and systematically. • The teacher looks at the process of students in compiling reports on the results of group discussions and provides assistance to students who are experiencing difficulties. • The teacher asks students to determine group representatives to present or present a classical discussion report.
Analyzing and Evaluating the Problem Solving Process	<ul style="list-style-type: none"> • The teacher provides the opportunity for the group to present the report on the results of the discussion classically • The teacher provides opportunities for students from other groups to respond politely to the results of the presenter group discussion. • The teacher involves students evaluating the answers of the presenter group as well as input from other students and making an agreement, if the answers submitted by students are correct. • The teacher provides the opportunity for other groups who have different answers from the first group of presenters to communicate the results of their group discussions in a series and systematic manner. • Teachers and students collect all information during discussions and questions and answers. • The teacher directs all students to conclusions about these problems.
CLOSING ACTIVITY	
<ul style="list-style-type: none"> • Students are asked to conclude about vaccines and AIDS. • The teacher displays the meaning of what students get in today's learning. • The teacher informs the learning activities that will be carried out at the next meeting. • The teacher ends the learning activity by giving messages and motivation to keep the spirit of learning and praying. 	

C. LEARNING ASSESSMENT

No	Aspect Assessed	Assessed Form	Assessment Instrument	Assessment Time
1	Attitude	Observations and Journals	Observation of attitudes (journal)	During Learning Process
2	Knowledge	Written Test	Test Questions	After Learning Process
3	Skills	<ul style="list-style-type: none"> • Performance. • Written report 	<ul style="list-style-type: none"> • Observation of work performance • Assessment of written reports 	<ul style="list-style-type: none"> • During the presentation • Assignment of tasks

**Knowing,
Headmaster**

**Jakarta, December 2020
Teacher**

Br. Fransiskus Sarwedi Sirait, BM

Mika Yanti Arita Pasaribu, S.Pd

RESULT

From the results of implementing HOTS-based learning and problem-based learning (PBL), it shows several things. First, HOTS-based learning and problem-based learning (PBL) encourage students to a better understanding of the concepts taught by the teacher because they themselves discovered the concept. Knowledge is embedded based on schemes owned by students so that learning is more meaningful. Students can feel the benefits of learning because the problems that are solved are directly linked to real life, this can increase students' motivation and interest in the material being studied. Second, students are more independent and mature, able to give aspirations and accept opinions from others, instill a positive social attitude among students. Through group learning activities the student interacts with other students so that the achievement of students' completeness can be expected. Third, the application of HOTS-based learning develops students' critical thinking skills. They began to question things related to their learning as well as contextual problems in their lives. Fourth, there was a heated discussion among the teachers about the HOTS learning and assessment system as a result of the limited understanding and application experienced in the classroom.

Supporting Factors

Some of the supporting factors that apply the learning system using a scientific approach with the Problem-Based Learning method and the development of higher order thinking skills, or what are called Higher Order Thinking Skills (HOTS) for students, include, 1) Teachers are motivated to further improve quality learning. 2) There are reference books to support learning in the school library so that students can develop understanding through scientific theories. 3) Availability of internet network in schools and teachers facilitated with internet data quota make it easier to study independently; looking for learning development resources. 4) The response of participants to this method of learning is quite positive and students are increasingly active in the learning process.

Obstacle Factor

In addition to the supporting factors, there are also several inhibiting factors for implementing learning with a problem-based learning approach and developing higher order thinking skills (HOTS), including: 1) Teachers' readiness to apply HOTS-based learning systems and Problem Based learning is not optimal. The teacher mindset has not completely changed, especially senior teachers who still tend to use conventional methods. 2) The teachers are still in the learning stage using the HOTS-based scientific approach and assessment. There is still confusion and problems in its full application. 3) The ability of the teacher to recognize students with various conditions and family backgrounds of students that affect maximum class management.

CONCLUSION

The conventional learning method is a traditional learning method or also called the lecture method, because this method has always been used as a means of oral communication between teachers and students in the learning and learning process. In the conventional learning method it is characterized by a lecture accompanied by an explanation as well as a division of tasks and exercises. This method is certainly no longer relevant in today's digital era.

The Indonesian Ministry of Education and Culture, through the transformation of the 2013 curriculum at the educational unit level, establishes the strengthening of the learning process using a scientific approach and familiarizes the development of higher order thinking skills, or what is called Higher Order Thinking Skills (HOTS) for students. In this case the teacher is an important part of implementing HOTS-oriented learning to invite students to think creatively and critically. So, every education unit including SMA Budi Mulia Jakarta must make reforms in implementing the policy in a concrete manner so that the objectives of national education can be implemented properly. Teachers are prepared and encouraged to implement HOTS-based learning and Problem Based Learning (PBL) through education and training, so that teachers are increasingly skilled in managing meaningful learning for students.

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