

Implementation of Problem Based Learning and Problem-Solving Models in Student Learning

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ABSTRACT

Implementation is an act of implementing activities carried out through planning and referring to certain rules to achieve goals. Curriculum changes are very important for the world of education in order to improve the standards and quality of education itself. In using problem-based learning and problem-solving models, students are given directions on how to solve problems and provide solutions. Based on the analysis, curriculum changes have an important role in education as a reference or basis in order to achieve better educational goals. Educational concepts and theories provide instructions for teachers on how to foster students so that they have the ability to be able to work together, interact socially well, create an atmosphere of friendship, help each other and respect each other. The implementation of problem-based learning and problem-solving methods is a new breakthrough that is needed by students so that the knowledge learned in formal educational institutions can be implemented directly in their lives. With problem-based learning and problem-solving methods, it is hoped that learning process will be done more effectively and efficiently and can be implemented in real life. The purpose of this study was to examine the implementation of problem-based learning and problem-solving models in student learning. This research uses literature study method.

Keywords: problem-based learning, problem solving, curriculum, learning

1. INTRODUCTION

The curriculum is a design and learning device that has been compiled and made by the government as a guide in implementing learning. Law Number 20 of 2003 concerning the National Education System (*Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional*) defines curriculum as a set of plans and arrangements regarding the objectives, content and learning materials as well as the methods used as guidelines for implementing learning activities in order to achieve national education goals. In the implementation of national education, Indonesia has undergone several curriculum changes since 1947.

The educational learning process is a reference or hypothesis that is shown in the use of education which is based on individual interactions in social life. Educational activities are a process of interaction between two individuals (educators and students) and even between two generations which allows the younger generation to develop themselves. Self-development occurs in educational activities. Therefore, educational activities can take place in the family, school and

community environment. The learning model according to Nurulwati (Shoimin, 2014) is a conceptual framework that can systematically describe the procedures for organizing learning experiences to achieve certain learning objectives, and serves as a guide for learning designers and teachers in planning teaching and learning activities.

The efforts to improve critical thinking skills can be done by designing learning activities that aim to train problem-solving skills. The problem-solving learning approach in learning aims to direct students to become problem solvers, to practice thinking skills starting from understanding problems to drawing conclusions on the results obtained.

According to Wena (2009); Suhendri & Mardalena (2013), the problem-solving method is to perform procedural operations in a sequence of actions, systematically step by step. Systematic problem solving is a guide to taking an action that functions to help someone solve a problem. Vinacke (1988); Suhendri & Mardalena (2013) explained, problem solving includes three stages of activities, namely the first stage, presenting a problem where students are faced with a goal

that must be achieved through several difficulties / obstacles, the second stage is activities towards problem solving where students will experience the process. mentally or symbolically, such as observing, recalling things that have been past, asking questions, expressing ideas, and the third stage is solving, where students may succeed or not succeed in achieving their goals.

Based on the opinions of the scholars above, it can be concluded that the problem-solving learning method is a systematic learning method consisting of stages of presenting the problem to students, then students solving the problem appropriately, and can communicate or express opinions orally about problem analysis and solution. The steps in the problem-solving learning method according to Pepkin (2004), consist of: problem classification, opinion expression, evaluation and selection, and implementation. The first step, the teacher provides a problem related to the subject matter to students. The second step, students are given the freedom to give their opinion on the problem. The third step, students analyze the problem and determine the appropriate solution. The fourth step, students solve the problem with the solution chosen and give reasons.

The Problem Based Learning (PBL) model is a learning model that uses real problems found in the environment as a basis for acquiring knowledge and concepts through the ability to think critically and solve problems. According to Sudarman (2007), the foundation of problem-based learning is a collaborative process. Learners will organize knowledge by building reasoning from all the knowledge they have and also from all the experiences gained as a result of interacting with fellow individuals. With problem-based learning, it is hoped that students can solve problems with various alternative solutions, and can identify the causes of existing problems.

The application of the problem-based learning model can help create learning conditions that were originally only in the form of transferring information from lecturers to students to a learning process that emphasizes constructing knowledge based on understanding and experience gained both individually and in groups. The problems posed in problem-based learning are real problems in the field.

Hmelo-Silver & Barrows (2006) states that the problems that arise in problem-based learning do not have a single answer, meaning that students must be involved in exploration with several solutions. Student involvement in problem-based learning can help develop critical thinking skills, because in this learning model students are fully involved in the learning process through problem solving activities. In this problem-solving activity, students are required to be able to develop critical thinking skills as a step to solve the problems discussed and be able to draw conclusions based on their understanding.

From the background that has been presented above, the title of the research taken is "The Implementation of Problem Solving and Problem Based Learning (PBL) Models in Student Learning."

2. METHOD

In writing this article, researchers used literature study or library research methods. Library research is a research method that searches for sources of journals, books and documents related to the topic being discussed. Information obtained from literature studies can be used to strengthen existing arguments.

3. RESULT AND DISCUSSION

3.1. Problem Based Learning (PBL) Model

Problem Based Learning or PBL is a learning model that uses real-world problems as a context for students to learn about how to think critically and problem-solving skills, as well as to obtain essential knowledge and concepts from learning materials (Sudarman, 2007). The steps in using a problem-based learning model can be explained as follows:

- a. Describe the competencies to be achieved and motivate students to be involved in the selected problem-solving activities.
- b. Explain the logistics required, the procedures to be performed and motivate students to be involved in the selected problem-solving activities.
- c. Defining and organizing learning tasks related to the problem such as setting topics, assignments, and schedules.
- d. Collect appropriate information, experiment to get explanations and problem solving, data collection, hypotheses, problem solving.
- e. Reflect or evaluate their experiments and the processes they use. This learning model is an effort that can be applied by teachers in prioritizing solving problems in daily life in a structured manner to construct student knowledge. With these learning models, students are able to think at higher levels and improve their ability to think critically and creatively.

Problem based learning also has its own objectives, the goal that PBL wants to achieve is the ability of students to think creatively, analytically, systematically, and logically to find alternative solutions to problems through empirical data exploration in order to foster scientific attitudes. Here are some learning objectives using the Problem Based Learning (PBL) model according to Wijayanto (2009).

Develop thinking skills and problem-solving skills. The processes of thinking about abstract ideas are different from the processes used for thinking about real-world situations. Resnick emphasized the importance of context and linkages at the time of thinking, namely that

although the thought process has some similarities in situations, the thinking process varies depending on what one thinks in solving the problem.

Problem Based Learning (PBL) is also intended to help student performance in real life situations and to learn the important roles that adults usually play. Resnick argues that this form of learning is important for bridging cooperation in completing assignments, has elements of apprenticeship learning that encourage observation and dialogue with others so that they can understand roles outside of school.

Teachers who continuously guide students by encouraging and directing them to ask questions and rewarding the in-depth questions they ask, by encouraging students to find solutions / solutions to real problems formulated by students themselves, it is hoped that students can learn to independently complete those solution-seeking tasks in the future.

3.2. Problem Solving Learning Model

Problem solving is a process of directing or encouraging students to be able to solve problems in the field of science they are learning. By learning problem solving students will be able to solve problems in accordance with the existing realities in the student environment by constructing students' initial knowledge with new knowledge found in groups. According to Majid (2015) the steps used in the use of problem-solving learning models can be explained as follows:

- a. Prepare clear issues/problems to be solved.
- b. Write down the goals/competencies to be achieved.
- c. Looking for data or information that can be used to solve the problem.
- d. Set a temporary answer. In this step, students must try to solve the problem so that they are absolutely sure that the answer really matches the temporary answer or does not match at all.
- e. Present the answers from each group.
- f. Draw conclusions.

3.3. Implementation of Problem Based Learning and Problem Solving

Changes in learning from conventional to problem solving models and problem-based learning models have a positive and effective impact on learning. Through problem solving learning methods students are actively involved in learning. Students are given the freedom to explore lesson information based on the solution to the problems they are looking for so that the subject matter is better understood by students because they are actively involved in learning and student interest in learning increases. According to Muhson (2005) application of problem-solving methods in advanced statistics learning can increase student interest in learning. The indication is

that learning becomes fun, able to increase students' active role and student independence.

In the Problem Based Learning (PBL) model, students work on authentic problems with the intention of compiling their own knowledge, developing inquiry and higher-order thinking skills, developing independence and self-confidence (Arends, 2008). The characteristics of problem-based learning include: (a) asking questions/problems, (b) focusing on interdisciplinary linkages, (c) authentic investigations, (d) creating products and showing them off, and (e) collaboration. In problem-based learning, students are freed to get the key issues from the problems they face, define their knowledge gaps and pursue the missing knowledge (Hmelo-Silver & Barrows, 2006). It is for this reason that problem-based learning is seen as a learning model capable of improving higher order thinking skills or critical thinking skills.

Critical thinking skills are influenced by intrinsic and extrinsic drives. A person's background in terms of personality and culture can influence a person's efforts to think critically about a problem in life (Hassoubah, 2007). Implementation of learning with the application of PBL in this study includes several steps, namely: (1) Preparation made by the lecturer by compiling a Semester Learning Activity Program Plan (RPKPS) and Student Activity Sheets (LKM); (2) Implementation of learning by applying problem based learning in an effort to develop critical thinking skills; and (3) Evaluation and Reflection, with research subjects about the obstacles encountered in implementing PBL in an effort to develop critical thinking skills.

From the description above shows that the application of problem solving and problem-based learning can help students develop critical thinking skills. This is in accordance with the opinion of Blumhof (2001) which states that through a problem-based learning approach, students are supported to improve positive performance in the learning process, including: (a) managing their own learning; (b) be active, reactive, and critical learning; (c) think deeply and thoroughly; and (d) allows learning with the problem situation that occurs.

Evaluation in problem solving learning and problem-based learning models is implemented in an integrated manner. Assessment not only measures the final result of the knowledge they learn, but also includes all activities that explain the implementation of each step that involves students' critical thinking skills. Reflection will be carried out at the end of the lesson. This reflection is used to obtain data about the responses and obstacles that students feel in learning. The obstacles experienced from the student's side include: limited relevant learning resources causing the discussion process to obtain a problem-solving solution sometimes being less sharp, and the obstacles encountered in small groups, namely that there are some students who are not proactive in

observation activities because they are passive in communicating.

The implementation of problem-based learning and problem-solving methods is a new breakthrough in the world of education. This implementation is really needed by students so that the knowledge learned in formal educational institutions can be implemented directly in their lives. The purpose of this problem-based learning and problem-solving method is also to make education more effective and efficient because it is certain that it can be implemented in real life.

4. CONCLUSION

Implementation is an act of implementing activities carried out through planning and referring to certain rules to achieve these goals. Curriculum changes are indeed very important for the world of education in order to improve standards and quality to achieve educational goals. Some things that can be noted from the implementation of the learning model on student learning. Problem Solving is a process that directs or trains students to be able to solve problems according to the field of science they are learning. By learning problem solving students will be able to solve problems in accordance with the realities in the student environment by constructing students' initial knowledge with new knowledge found in groups. Through problem solving students are taught to be sensitive to the surrounding environment, able to read a problem and try to find the right solution to solve the problem.

Problem Based Learning is a learning model that uses real-world problems as a context for students to learn about how to think critically and build skills in solving problems, as well as to acquire essential knowledge and concepts from learning materials. With PBL students are taught to be able to respond to a problem and try to find a way out by thinking critically, making analyzes, arranging steps to solve problems systematically. Teachers can make problem solving learning models and problem-based learning models as an alternative in the teaching and learning process to improve student learning outcomes.

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