

Problem Based Learning Model to Promote Critical Thinking

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Abstract: Conventional learning tends to give materials directly centered on a teacher. Learners are more passive and just accept the lesson. Learning activities are taking notes and memorizing a lot of things. As a result, students become bored and lazy in thinking inside and outside the classroom. Problem-based learning model emphasizes problem solving process scientifically. The goal is to encourage students to think critically, analytically, systematically and logically to find alternatives to problem solving through data exploration empirically. Learning strategy is defining the problem, diagnosing, formulating alternative strategies, determining strategies, and evaluating. Meanwhile, learning steps consist of clarifying terms and concepts, formulating the problem, analyzing, organizing ideas, formulating learning goals, finding information and synthesizing. Using this model, a teacher will be able to increase the critical thinking and analytical skills of the students.

Key words: critical thinking, problem based learning, strategy, learning procedures

The process of education in schools is a planned process and has a purpose so that everything done by the teacher and students are directed to the achievement of learning objectives. The planned educational process aims to create a conducive learning atmosphere and absorbing learning process. Therefore, the process and result of learning should run in a balanced way so that students are able to think and analyze a problem systematically.

Thinking is a mental activity that helps formulate or solve problems, make decisions, or fulfill a desire to understand. Critical thinking is reflective reasoning about beliefs and actions. Critical thinking is regarded as a life skill that will equip children to face the best information they hear and read, the events they experienced, and the decisions they make every day.

The essence of learning is building better student's behaviors. Teacher is a driver of student learning having a major role in fostering the spirit of the students to learn. By using an interesting learning model, students will be easier to understand and develop their knowledge. Problem-based learning is a learning model that encourages students to think critically to a problem so that they can apply in their daily lives.

Critical Thinking

According R.H. Ennis (1991), Critical thinking is reasonable, reflective thinking by emphasizing decision-making about what to believe or do. Knowing the trends and the ability is very important to become a critical thinker. This will help realize on the disposition and ability so that they have capability to apply critical thinking in the classroom or in everyday life (Hasoubah, 2007).

Swartz and Perkins (1990) say that critical thinking means: a) achieving a critical assessment of what we will receive or what will we do with logical reasons; b) using standardized assessment as a result of critical thinking in decision making; c) applying various models which are composed and give reasons to define and implement the standards; d) finding and collecting reliable information used as evidence to support a judgment (Hasoubah, 2007).

Critical thinking is a systematic process that allows students to formulate and evaluate their own beliefs and opinions. Critical thinking is an organized process facilitating students to evaluate evidence, assumptions, logic, and language of the underlying statements of others. Critical thinking is good thinking and pondering that process of thought is a part of good thinking.

How to improve critical thinking skills in the classroom or when interacting with others includes some following suggestions: a) reading critically; b) developing observation capability/ observing; c) increasing curiosity, inquiry and reflection capabilities; d) metacognition; e) observing the model in critical thinking; f) rich discussion

Problem Based Learning

Definition

Problem-based learning (PBL) model can be interpreted as a series of learning activities that emphasize the process of problem solving encountered scientifically (Amir, 2009). PBL is a curriculum and learning process. In the curriculum, it designs problems requiring students to get the essential knowledge, which makes them adept at solving problems. In addition, PBL let students have their own model of learning and have the skills to participate in the team. The learning process is a systematic approach to solve problems or challenges needed in everyday life.

Problem-based learning model was developed based on the concepts proposed by Jerome Bruner. The concept is discovery learning. In discovery learning, there are learning experiences and activities that emphasize inquiry. With the stimulus in the form of problems related to the subject matter, students' ability to analyze a problem based on the theory will bear the appropriate knowledge and new ways to address the problems connecting with the subject matter studied. Dutch explains that PBL is an instructional model that challenges students to "learning to learn", working in groups to find solutions to real problems (Suprijono, 2009). PBL prepares students to think critically and analytically to find and use appropriate learning resources.

Characteristics and Goals

A key feature of problem-based learning includes orienting students to authentic problem or question, employing multidisciplinary, requiring cooperation in the investigation, and producing works. In problem-based learning, situations or problems become the starting point of learning to understand the concepts and principles enabling to develop problem-solving skills (Sanjaya, 2009).

There are three characteristics of problem-based learning model as follows: a) problem-based learning model is a series of learning activities; b) learning activities are directed to solve the problem; c) problem solving is done by using a scientific thinking approach.

The goals of this model is the ability of students to think critically, analytically, systematically, and logically to find alternatives of problem solving through the exploration of empirical data in order to develop scientific attitude. PBL involves presenting authentic and meaningful situations that serve as the foundation for investigation by the learners. Furthermore, features of problem-based learning by Arend are as follows (Sanjaya, 2009):

1. Authentic problem. Problem-based learning organizes important real issues which are socially important and meaningful for students.
2. Interdisciplinary focus. This means that students learn to think structurally and learn to use a variety of scholarly perspectives.
3. Authentic Investigation. Learners are required to analyze and define problems, collect and analyze information, conduct experiments, make inferences, and draw conclusions.
4. Product. PBL requires students to construct products as a result of the investigation. Paper products can be described and demonstrated to others.
5. Collaboration. Collaboration of the learners encourages inquiry and dialogue to develop thinking skills and social skills.

Furthermore, problem-based learning has many potential benefits, namely: a) being able to memorize and increase understanding of learning materials; b) increasing focus on relevant knowledge; c) promoting the thought; d) building teamwork, leadership, and social skills; e) motivating learning skills; f) motivating learners

Learning result of problem-based learning is students' inquiry skills. It means that learners have the skills to overcome the problem. They can become self-reliant and independent learners.

Learning Procedures

Problem Based Learning process could be implemented in case the teacher is ready with all the tools needed (problem, complementary forms, etc.). Students also must understand the process, and have formed small groups. Wood (2003) explains that each group runs the process mostly known as the seven steps as follows: a) identification and clarification of terms; b) defining the problem; c) brainstorming session to discuss the problem and relate it to the prior knowledge; d) arranging elaborations into tentative solution; e) formulation of learning objectives; f) private study to gather

information needed to achieve learning objectives; g) groups share results of the private study and facilitator checks learning and may assess the group.

In addition, steps of material selection are the following: a) learning materials should include issues containing the conflict from news, recordings, videos, and so forth; b) selected materials are materials that are familiar to the students so that each student can follow it properly; c) selected materials are materials related to the people interests in order to obtain the benefits; d) selected materials are materials supporting the goals or competencies that should be possessed by the student in accordance with the applicable curriculum; e) the materials are appropriate for the students' interests so that each student is required to study (Amir, 2009).

Problem-Based Learning Model to Promote Critical Thinking Skills

One of the benefits of problem-based learning is to encourage students to think. Learning activities are to stimulate students to ask questions, analyze, and think critically on the issues discussed. Johnson (2007) suggests there are five steps in problem-based learning strategies through group activities, namely:

1. Defining the problem, namely the problem of formulating a specific event that contains the issues of conflict, so that the student becomes clear what problem will be studied. In this activity, the teacher can ask students their opinions and explanations about actual issues interesting to solve.
2. Diagnosing the problem, that is to determine the causes of the problem and analyze the various factors hindering or supporting problem solving. This activity can be done in small group discussions so that students can sort priority of the actions according to the type of resistance predicted.
3. Formulating alternatives of strategy, that is to examine each action formulated through class discussion. At this stage, each student is encouraged to think and express arguments about the possibility of any action to perform.
4. Determining and implementing the strategy of choice, namely the decision making about strategy to do.
5. Evaluating both the process and the result. The process evaluation is an evaluation towards implementation of all activities, while the result evaluation is the evaluation towards the effects of implementing the strategy.

A stimulus is needed in order that persons are able to think creatively to improve their critical skills. In problem-based learning model, subjects or topics are not limited to the subject matter derived from certain events in accordance with the applicable curriculum. The selection of interesting, actual, and slightly controversial problems are needed so that students are motivated to explore information and critical thinking to the issues discussed in class.

Conclusion

PBL is a student-centered pedagogy in which students learn about a subject through the experience of problem solving. Students learn both thinking strategies and domain knowledge. The goals of PBL are to help the students develop flexible knowledge, effective problem solving skills, self-directed learning, effective collaboration skills, and intrinsic motivation.

By employing PBL, teachers encourage learners to learn actively with the concepts and principles. Learners try to connect the experience owned with the new experiences faced so that they discover new principles. In addition, learners learn independently in solving problems by developing the ability to analyze and manage information. PBL is a learning model that allows students to learn more active and innovative in the classroom.

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