

Discovery Learning Model in the Course of Curriculum and Instructional Materials Development to Enhance Students' Critical Thinking and Creativity

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ABSTRACT

This article aims at reporting the study on the forms of students' critical thinking and creativity in developing instructional materials through Discovery Learning Model in the course of Curriculum and Instructional Materials Development. The study was of a descriptive qualitative type with the subjects of thirty seven students of batch 2017 in the English Language Education Department in University of Adi Buana Surabaya Indonesia. The data was students group activities and ideas reflected in their assignments. They were collected through non-participant observation, documentation, note taking and recording, as well as interviews, which was then analysed through separation and connection techniques. The result showed that the implementation of Discovery Learning Model in the course of Curriculum and Instructional Materials Development enhanced the students' critical thinking and creativity in developing instructional materials.

KEYWORDS: Discovery Learning Model, Curriculum and Instructional Materials Development, Students' Critical Thinking, Creativity.

INTRODUCTION

The creative way requiring critical thinking skills is a new learning model for the 21st century. Nurturing curiosity and inspiring students to explore various applications for the knowledge and skills they have learned demand their creativity and critical thinking skills. However, as a matter of fact, based on some observations and preliminary evaluations, about 60 % of the students in the English Language Education Department taking Curriculum and Instructional Materials Development still face difficulties to analyse the existing curriculum (The Curriculum of 2013) to develop instructional materials to become teaching-learning devices. To overcome the problems, Discovery Learning Models can be a solution, since it develops ways of active learning through which students learn analytical thinking, investigate and solve problems themselves, then the results obtained will be durable in memory (Bruner, 1961). (Sanchez & Facione, 2010)

Solving the problems faced by students by following the 21st century learning patterns requires more personalized learning to support creativity. According to (Redecker & all, 2011), personalization has implications about what, how and where a teacher prepares learning devices. It can occur through collaboration which allows the process of sharing innovations to occur faster and information about the talents and progress of students is more quickly known. Learning in the 21st century is expected to foster curiosity and inspire students to explore various applications for the knowledge and skills they have learned.

MATERIALS AND METHODS

In line with the results of a study conducted by Johnson (Sanchez & Facione, 2010), students who have adequate critical thinking skills are likely to be able to study problems systematically, face millions of challenges in an organized manner, formulate innovative questions, and design solutions that are seen as relatively new. This is also supported by (Wina, 2008) who states that, "learning to think emphasizes the process of finding and finding knowledge through interactions between individuals and the environment".

Creativity activity is a cognitive activity that produces a new view of a form of the problem and is not limited to pragmatic results (Solso & Maclin, 2007). According to (Suharman, 2011) creativity can be understood as a thought process to produce new ideas, new approaches, or new works that are useful for

solving problems or the environment. These new things can be seen both from an idea or a work. Based on the findings of an expert namely Guilford (Suharman, 2011), creative thinking skills consist of fluency, flexibility, detail (elaboration) and originality.

According to (Sinambela, 2017) the implementation of Discovery Learning is: **First**, Stimulation (giving stimulation). Students are given problems in the beginning so that they are confused which then raises the desire to investigate it. At that time the lecturer as a facilitator by giving questions, reading text direction, and learning activities related to discovery. **Second**, problem statement (statement / problem identification). The second stage of this learning is that the lecturer gives the opportunity for students to identify as many events as possible from problems that are relevant to the subject matter, then one of them is chosen and formulated in the form of a hypothesis (temporary answers to problem questions) **Third**, data collection (data collection), functions to prove related statements so that students have the opportunity to collect various appropriate information, read appropriate learning resources, observe objects related to the problem, interview with informants related to the problem, conduct independent trials. **Fourth**, data processing (data processing), is an activity to process data and information previously obtained by students. All information obtained are all processed at a certain level of trust. **Fifth**, verification (proof), namely an activity to prove the true or failure of an existing statement. which is already known, and is associated with the results of existing data. **Sixth**, generalization (drawing conclusions / generalizations). This stage is to draw conclusions that will be used as a general principle for all the same problems. Based on the results, the principles underlying the generalization is formulated.

This study used a qualitative descriptive research design. This was chosen, because it was able to fully describe the process of students' critical and creative thinking skills in learning using Discovery Learning Model in the Course of Curriculum and Instructional Materials Development. The subjects in this study were 37 students of English Language Education Department. The object of this research was to describe the ability to think critically and creatively in learning that used the Discovery Learning Model in Curriculum and Instructional Materials Development Course.

Data collection methods used in this study were observations while making field notes of the students' group activities, documentation of students' tasks in developing teaching-learning devices, and interview concerning students' analytical as well as critical thinking process, to obtain students' opinions and reasons in the use of communication strategies. In this study the researchers used nonparticipatory observation methods (Bogdan & SK, 1992) (Mahsun, 2013). When making observations, specific things or extraordinary things occurring in the classroom during learning process were recorded, such as class conditions, speech situations, and speaker expressions. The analysis of this study was presented in a qualitative descriptive manner. The entire data was analysed based on the guidelines used and classified according to the research problem

RESULT AND DISCUSSION

By using cooperative learning strategies the class was divided into several groups to conduct following activities:

A. STAGE OF STIMULATION

1. Analyzing basic curriculum competencies to determine learning indicators and objectives.
2. Formulating indicators and objectives using operational and specific verbs.

The results obtained using the stages of stimulation at the beginning of the learning activities were that students were able to think critically in analyzing basic competencies into indicators and objectives using the guide questions asked by the lecturer.

The results of critical thinking of students in the group produced a creativity to develop learning activities.

B. STAGE OF PROBLEM STATEMENT

The next stage, the lecturer gave directions to students to be able to:

1. link indicators and objectives that had been determined with the materials to be discussed (Redecker & all, 2011).
2. organize learning activities in accordance with predetermined indicators and objectives.

3. review assessment tools to measure the success rate of indicator achievement.

The results of identifying problems critically, caused the students to think creatively and flexibly. Which made them to:

1. provide various interpretations of a materials
2. apply a concept in different ways in understanding materials
3. give consideration to the level of ability of students who will study the materials.
4. think of various ways to achieve learning indicators and objectives.

C. STAGE OF DATA COLLECTION

In the data collection stage, students

1. interpreted information about indicators, objectives and materials to be developed in learning-teaching materials.
2. made notes about the similarities and differences in indicators, objectives, and materials that would be developed in learning-teaching materials.

The results of this stage were that students were able to think original thought, e.g

1. thought of problems that others had never thought of that would be contained in learning- teaching materials.
2. provided new ideas in solving problems (problem training) as outlined in learning -teaching materials.

D. STAGE OF DATA PROCESSING

At the stage of data processing students thought critically for:

1. test indicators and objectives determined using relevant criteria and standards.
2. open thinking by using a variety of alternative systems of thought, by recognizing, evaluating, and looking for relationships between all indicators and objectives with the materials that would be contained in learning-teaching materials.

The results of critical thinking enabled students to think elaboratively for:

1. looking for meaning or solving deep problems of errors in determining indicators and objectives relevant to the learning-teaching materials.
2. enriching ideas in developing various alternative indicators and objectives.
3. building linkages between indicators, objectives and materials.

E. STAGE OF VERIFICATION

At the stage of proofing the results of previous critical thinking, students were able to

1. distinguish between facts and theories about the materials that would be contained in learning-teaching materials according to indicators and objectives.
2. find solutions to complex problems about the topic in question.

The ability of students to think evaluatively was shown by the capability to:

1. give consideration if the additions to the incompatibility between indicators, objectives, materials and practice questions were outlined in learning-teaching materials.
2. analyze the problem critically if there was a match between indicators, objectives and materials and practiced questions in learning-teaching materials.

F. STAGE OF GENERALIZATION

At the end of the activity in learning that used the Discovery Learning Model, students drew conclusions and solutions with reasons and evidence, then tested them using relevant criteria and standards.

Students were able to use failure as a means for learning and had the ability to create renewal based on their initial knowledge.

CONCLUSION

1. Learning activities using Discovery Learning Model are in accordance with the development of critical thinking in problem solving towards understanding the demands of basic competencies in the curriculum. The learning activities mentioned above also train students to learn to find out and apply interconnections between concepts in Curriculum and Instructional Materials development and everyday life (critical thinking).
2. Learning activities using Discovery Learning model can develop students' creativity and innovation in developing basic competencies into indicators and objectives in accordance with the materials to be contained in learning-teaching materials. These activities can also develop the talents and careers of students in achieving their desired objectives through the development of assigned creativity (learning to be), as well as working on a work related to the concept obtained (learning to do).

References

- Bogdan, R., & SK, B. (1992). *Qualitative Research for Education: An Introduction to Theory and Methods*. Boston, London: Allyn and Bacon, Inc.
- Bruner, J. (1961). *The Act of Discovery*. New Jersey: Prentice Hall, INC.
- Mahsun. (2013). *Metode Penelitian Bahasa: Tahapan Strategi, Metode, dan Tekniknya*. Jakarta: Rajawali Pers.
- Quitadamo, I., L.F, C., & J.K, M. (2008). Community-based Inquiry Improves Critical Thinking in General Education Biology. *CBE-Life Science Education*, 327-337.
- Redecker, C., & all, e. (2011). *The Future of Learning Preparing for Change* . Luxemburg: Office of the Europe Union.
- Sanchez, C., & Facione, N. (2010). The Disposition toward Critical Thinking. *Journal of General Education*, 1-25.
- Sinambela. (2017). *Kurikulum 2013 dan Implementasinya dalam Pembelajaran*. Jakarta: Generasi Kampus.
- Solso, R., & Maclin, O. (2007). *Psikologi Kognitif*. Jakarta: Erlangga.
- Suharman. (2011). *Kreativitas Teori dan Pengembangannya*. Surabaya: Laros.
- Wina, S. (2008). *Strategi Pembelajaran Berorientasi Standar Proses Pendidikan*. Jakarta: Kencana Prenada Media Group.