CONCEPTUAL UNDERSTANDING PROFILE OF LEOV JUNIOR HIGH SCHOOL STUDENTS BASED ON KOLB'S LEARNING STYLE

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ABSTRACT

This study is a descriptive qualitative research. It describes conceptual understanding profile of Junior High School students on LEOV (Linear Equation of One Variable) topic based on Kolb's learning styles that consist of Assimilator, Accommodator, Converger, and Diverger. To achieve the aim of this study, the researcher seek out four 7th grades students of 22 Junior High School of Surabaya as sample of this study. There were three phases on analyzing data: data reduction, data interpretation, and conclusion. This research describes that Assimilator (SA) makes connection between different representations by seeing its similarity, makes symbol representations and uses algebra manipulation in solving LEOV problem. SA analyzes abstract concept, solved problems logically, step by step from assumption until conclusion. Accommodator Subject (SM) makes connection between different representations by seeing its numbers similarity, and plans concrete strategies in solving problems. Converger Subject (SK) defines LEOV by connecting variables and linear equation ideas. SK makes connection between words (K), diagram (D) and symbol (S) representations based on practical used, where SK thinks that diagram is more practical than words (K) and symbol (S) representations. SK analyzes abstract concept, solves problems logically, and makes a brief conclusion. Diverger Subject (SD) makes connection between different representations by seeing its numbers and letters similarities from its solution. SD was unsystematic while he was analyzing abstract concepts.

Key Word: Conceptual Understanding, LEOV, Kolb's Learning Style

INTRODUCTION

Linear Equation of One Variable (LEOV) is one of basic algebraic material that consist of symbols and numbers. It was taught in Junior High School level in Indonesia. LEOV is necessary to be taught as basic algebra because it has important role in mathematics, for example manipulating symbols and numbers to find the solution of a real world problem solving. Although some of the recent reform movements have attempted to make algebra more meaningful for students by infusing "real-world" problem-solving activities and multiple representations of these problems into algebra curricula, these same curricula have tended to maintain the traditional dichotomy of procedures and concepts when dealing with the transformational activity of algebra in the later years of high school (Kieran, 2011). Panasuk (2011) said that conceptual understanding provides the basis for developing the study that offered another perspective on the process of assessing algebra students' conceptual understanding of linear relationship with one unknown. Conceptual understanding in LEOV should be mastered by connecting concepts and algorithm effectively.

Besides, teacher has an important role to teach students in constructing concepts. Teacher should know students' characteristics and learning style in teaching and learning process. Since every students have different learning style, it implies the difference of students understanding in getting information while studying. DePorter dan Hernacki (2003:119) said that learning style is a combination of how students get, arrange, and combine information.

Chih WU, Nell & Lowell (1998) assert that learning styles affects conceptual understanding in some material of learning. In this study, researcher uses Kolb's learning style. Kolb (1984) classified four kinds of learning style: Assimilator, Accommodator, Converger, and Diverger. Kolb's learning style focus in learning model based on experience. It is relevant with the definition of understanding by Sierpinska (in Susanto, 2011) that understanding as the mental experience of a subject by her/him relates an object (sign) to another object (meaning). In learning process, understanding

occurs, if students define and express mathematics symbols. Knisley (2002) said that Kolb's learning style can be used in mathematics learning especially in problem solving approach by devising and developing strategies to construct concept. The aim of this study is to describe conceptual understanding in LEOV of Junior High School students based on Kolb's learning style.

METHODS

The type of this study is a descriptive research with qualitative approach. This study will be conducted in one of Indonesia school that is 22 Junior High School Surabaya. It involves four students on seventh grades based on their learning styles. However the researcher will consider others variables such as gender, mathematics ability, and age to be controlled.

The main instrument is the researcher itself as a conductor of the research process. Besides, the supporting instruments are required to support the research which consist of Honey & Mumford LSQ, conceptual understanding of LEOV test (TPK), and interview protocol. Data analysis will be conducted after completing data collection. The procedures of data analysis based on Miles and Huberman (1994: 10) which consist of data reduction, data display, drawing conclusion, and verification. Systematically, the research procedures of this study consists of three main stages namely preparation, implementation, and reporting.

RESULT AND EXPLANATION

Description of Assimilator Subject's (SA) Conceptual Understanding

Assimilator subject (SA) solves TPK logically, step by step, and using theory which he got before. SA read the given problem carefully, analyze logically, then solving the problem correctly. For example, SA define LEOV based on its properties that LEOV has equality concept, one variable, and linear. This properties is used as the reference to mention the example of LEOV and non-LEOV. SA writes three LEOV and non-LEOV examples.

The invention of this study is relevant with the theory that Assimilator subject creates concepts by himself and integrates it to be a reasonable theory by using systematics strategies. Besides, SA makes opinion by observing and reflecting his experience from many perspective.

SA makes connection between different representations based on the similarity of given symbols and numbers. It was relevant with the theory of Kolb & Kolb (2005) who said that assimilator students learn from watching from many perspective. For example, SA mentions that word representation is more varied than picture and symbol representation.

He said that word representation gives him freedom in using symbol as the unknown parameter.

In addition, SA can makes symbol representation fluently and manipulates it correctly in solving LEOV problem that related to the real-world problem. Kolb & Kolb (2005) asserted that Assimilator students analyze the abstract problem logically, step by step: start by assumption then make conclusion at the end of the process. SA devise the strategy systematically so that researcher easily to describe the profile of him.

Description of Accommodator Subject's (SM) Conceptual Understanding

Accommodator Subject (SM) solves TPK based on his concrete experience. For example, SM defines LEOV as an expression that consist of letters and numbers with equality symbol on it. By using interview protocol, researcher ask SM that LEOV has only one variable and linear symbol. That definition is used to write the LEOV and non-LEOV examples.

The invention of this study is relevant with the theory that accommodator subject learn by using active experimentation (AE) and concrete experience (CE). On the other hand, SM only connects word representation and symbol representation based on its similarity where symbol representation is a mathematics model of the given word representation. SM prefer concrete object to abstract object. In this case SM choose symbol representation which reflect the properties of LEOV. Kolb & Kolb (2005) asserted that Accommodator students involve actively in learning and prefer intuition than logic. Based on the result of this study, SM is unsystematically in devising plan in solving problem related to LEOV.

Description of Converger Subject's (SK) Conceptual Understanding

Converger subject (SK) solves TPK using his conceptualization. SK defines LEOV as a mathematics expression which has one linear variable where the right side and left side of the expression is separated by equal symbol. In other words, converger subject sees LEOV as mathematics expression and defines it correctly.

Knisley (2002) asserted that converger students learn by Abstract Conceptualization (AC) and Active Experimentation (AE). SK makes connection between different representations: word (K), diagram (D) and symbol (S) representation based on the uses of it practically. Diagram representation is chosen because he think that it is easier than the other representation. Besides, SK makes connection the relationship of the representation based on numbers and letters similarity. SK see the similarity of it from many perspective as assimilator subject did. SK is responsive in making decision. He makes mathematics model based on the given information. It

is relevant with Kolb & Kolb (2005) that converger students learn based on his own theory to make decision and solve problem by devising strategies with individual approach.

Description of Diverger Subject's Conceptual Understanding

Diverger Subject (SD) solves TPK based on his concrete experience. SD defines LEOV as the equation that only has one linear variable. This definition is used to mention LEOV and non-LEOV examples.

The invention of this study is relevant with Knisley (2002) that diverger students learn by Reflective Observation (RO) and Concrete Experience (CE). SD makes connection between words (K), diagram (D) and symbol representation (S) based on the similarity of letters and numbers. SD thinks creatively. He makes two different mathematics symbol based on the information correctly. Kolb & Kolb (2005) asserted that diverger students have good imagination and creative in making connection of information and in solving problem. He is unsystematic. Strategies that used by him to solve problem related to LEOV is working backward.

CONCLUSION

Based on the result of study. It can be concluded that Assimilator, accommodator, converger, and diverger subject solve real-world problem using their own knowledge and representation, while converger students prefer to use diagram representation because it is practically. Accommodator and diverger subject use symbol representation in solving problem and assimilator subject prefer word representation. This study is not only invent the similarity between assimilator and diverger subject solve problem based on many perspective but also converger do the same thing in solving problem. While accommodator prefer concrete objects rather than abstract object.

This study suggests that different learning style of Kolb should be considered to facilitate them well in teaching and learning process. Teacher as the important role in class should give opportunities to students' in mastering LEOV material based on their conceptual understanding and experience in solving real-world problem that is related to LEOV topic.

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