



## Analysis of Students' Ability in Solving Two-Variable Linear Equation System (SPLDV) Questions in Class XI SMA Negeri 1 Siborongborong Academic Year 2019/2020

Yusniar Nova Tambunan

Universitas Sisingamangaraja XII Tapanuli .

Email : [yusniar@gmail.com](mailto:yusniar@gmail.com)

### ARTICLE INFO

#### Article history:

Received: 01/08/2020

Revised: 20/08/2020

Accepted: 30/08/2020

#### Keywords:

analysis of students' abilities in solving system problems of two-variable linear equations

### ABSTRACT

This study aims to: 1) determine the learning outcomes of class XI IPA-3 students of SMA Negeri 1 Siborongborong in solving math problems on the subject of two-variable linear equations, 2) Knowing the level of understanding of the steps for solving and working on math problems on the subject of linear equations two variables in class XI IPA-3 SMA Negeri 1 Siborongborong. This research uses descriptive method. The subjects of this study were students of class XI IPA-3 at SMA Negeri 1 Siborongborong in the academic year 2019/2020. This research was conducted with the research object of the ability to solve two-variable linear equations system problems. Data obtained from the results of written tests and interviews with several students. The results of this study indicate that the percentage of student learning outcomes in class XI IPA-3 is 28.94%. This percentage was obtained because of the 38 students who took the test, only 11 students scored above the KKM (KKM = 77). This shows that the students' abilities are still low. On the other hand, the level of understanding in solving questions based on Bloom's taxonomy, seen from the description of the answers of all students, shows that students in class XI IPA-3 consist of unistructural levels (28.94%), multistructural (39.47%), relational (21, 05%), and extended abstract (10.52%). Meanwhile, the level of understanding of students based on the results of interviews with several students showed that students in class XI IPA-3 consisted of multistructural, relational, and extended relational levels. Overall, both based on student descriptions and interview results, the level of understanding of class XI IPA-3 students tends to be at the multistructural level.

Copyright © 2021 Jurnal Mantik.

All rights reserved.

### 1. Introduction

Education in every discipline helps students to think, also helps students to be responsible for their thinking. Thus education is no longer in doubt in terms of training our ability to think clearly. Utami (2004: 6) argues that: "Education has a very determining role in the development and manifestation of individuals, especially for the development of the Nation and State" ..

Therefore, the government keeps thinking about efforts to improve the quality of education. This can be seen in the distribution of government budgets, that the allocation of funds for education is higher than in other sectors. This is stated in Appendix XIX of Presidential Regulation (Perpres) Number 107 of 2017 concerning Details of the State Budget (APBN) for Fiscal Year 2018 which allocates funds for education of IDR 444.131 trillion or 20% of the total APBN of IDR. 2,220 trillion.

That is the importance of education for humans, because with education humans gain knowledge and intelligence and can develop abilities, attitudes and behavior. One of the education that is needed by humans is mathematics education. Mathematical science is a field of science that plays an important role in human survival and the development of other sciences.

Therefore, mastery of mathematics subjects from Elementary School to Senior High School can be a provision for students to develop themselves in various fields of expertise both related to mathematics and professions that are not related to mathematics.

According to the researcher's experience during the Field Experience Program (PPL) at SMA Negeri 1 Siborongborong, students' ability to master the basic concepts of mathematics is still very weak, especially in understanding the basic mathematical concepts of two-variable linear equation systems. Thing This is also clarified based on the information of one of the mathematics teachers of SMA Negeri 1 Siborongborong, in



general students understand when the teacher explains the material in class but when faced with solving the problems they make many mistakes, especially in evaluating the solving of problems with the two linear equation system material. variable.

In learning at SMA Negeri 1 Siborongborong, students find it very difficult to understand the system of two-variable linear equations. This can be seen from the behavior of students who tend to be vacuum and only position themselves as listeners and receivers.

Therefore, this material needs to be taught to students thoroughly and this research is considered important to describe students' mathematics learning outcomes in solving two-variable linear equation system problems.

## **2. Literature review**

### **2.1 Theoretical Framework**

#### **a. Analysis**

The analysis in this study is the investigation and decomposition of the students' abilities in solving the Two Variable Linear Equation System (SPLDV) questions which are examined through the learning outcomes and the level of understanding of the steps and workmanship of the Two Variable Linear Equation System (SPLDV) problems. .

#### **b. Math Problems**

A problem is defined as any task or activity in which students do not have the correct specific rules or methods of completion. Mathematical problems are questions related to mathematical material. A problem is a problem solving for someone if that person has the knowledge and ability to solve it.

#### **c. Solve SPLDV math problems**

According to Utami M (2004: 150) ability is the power to perform an action as a result of nature and training. The achievement of that ability means that it can be seen from the results of a test or test in achieving a certain process. If someone can fulfill the test given, it can be said that he is capable or able to do something. So the student's ability to solve SPLDV questions as seen from the learning outcomes obtained and the student's achievement in solving the given math problems.

#### **d. Mathematics Learning Materials of Two Variable Linear Equations**

In general, effective mathematics learning is a teaching and learning process that is built by the teacher who is able to actively involve all students to develop students' creativity in thinking so that it can increase good mastery of mathematics material.

To solve two-variable linear equation problems in everyday life in the form of story problems, the following steps are needed in order to help solve them:

- 1) If you need a diagram (sketch), for example for a problem related to geometry, make a diagram (sketch) based on the sentence of the story.
- 2) Two unknown quantities, for example, with two variables.
- 3) Translating story sentences into math sentences in the form of equations.
- 4) Solve these equations.

## **3. Research methodology**

### **3.1 Types of research**

This type of research is a qualitative-quantitative descriptive study.

Quantitative research is a method for testing certain theories by examining the relationship between these variables. These variables are usually measured by research instruments so that data consisting of numbers can be analyzed according to statistical procedures.

In this study, researchers conducted research on students' abilities through student learning outcomes to be analyzed in order to obtain quantitative data.

### **3.2 Research Subjects and Objects**

The subjects of this study were students of class XI IPA-3 SMA Negeri 1 Siborongborong. While the object of this study was the ability to solve SPLDV questions as measured by learning outcomes and the level of understanding of the steps in solving Two Variable Linear Equation problems.

### **3.3 Form of Research Data**

The form of data in this study is data on the results of students' written tests, descriptions of the steps for the written test questions and the results of interviews. Written test results are used to see student learning outcomes. Meanwhile, the data on the descriptions of the steps for taking the written test and the results of

the interviews regarding the steps for solving the questions carried out by students will be used to see the level of understanding in solving questions.

### 3.4 Method data collection

The data collection method in this research is a test method in the form of a written test and a non-test method in the form of an interview.

### 3.5 Research Instruments

The research instrument is a tool used to collect data in a study. This data is needed to answer the problem formulation / research question.

### 3.6 The validity of research instruments

The instruments used in this study included a written test and a list of student interview guidelines. In order for the data obtained to be valid and in accordance with the research, the instrument needs to be tested first.

### 3.7 Data analysis method

Data analysis is carried out to examine all the data that has been obtained during the study so that the data can provide the information needed to answer the problem formulation and solve the problems in the research. The data analyzed in this study were the results of the students' written tests, descriptions of the steps in the written test questions and the results of interviews.

### 3.8 Research Implementation Plan

The research implementation plan is:

- a. The Pre-Research Stage
- b. Research Implementation Stage
- c. The Post-Research Stage

## 4. Results and Discussion

### 4.1. Research Implementation

The implementation of this research includes the preparation stage and the data collection stage. The preparatory stage includes obtaining a permit, observing the school environment and discussing it with the mathematics subject teacher. The data collection stage was in the form of a written test on class XI IPA-3 students of SMA Negeri 1 Siborongborong and then continued with interviews with students.

### 4.2. Data Tabulation

#### a. Description of Research Results

##### 1) Written Test Result Data

The data on the written test results were seen from the math problems of class XI IPA-3 SMA Negeri 1 Siborongborong. With this test, researchers can measure students' ability to solve math problems.

##### 2) Data Descriptions of Steps to Work on Written Test Questions

The data describing the steps for completing the students' written test questions are in the form of steps to work on the questions grouped based on the completion steps with almost the same answers.

##### 3) Interview result

Based on the results of the written test, students were classified based on their KKM completeness and the low-medium-high classification.

#### b. Discussion of Research Results

The average of the written test results obtained by the students of class XI IPA-3 was 64.26. From these results, 11 students scored above the KKM ( $\geq 77$ ) or 25.58% of all class XI IPA-3 students. The remaining 32 students or 74.58% of all class XI IPA-3 students had not reached the grade. KKM. While the grouping of students based on value groups (low, medium and high) shows that the lowest score group is 11 people (22.58%), the medium value group is 15 people (34.88%), and the highest score group is 17 people (39, 53%). This low and medium group is also a group of students who did not complete the KKM. However, for the high group, this group consisted of students who did complete and did not complete the KKM with a percentage of 6 people (13.95%) who did not complete and 11 people (25.58%).

## 5. Conclusion

Overall, both based on the descriptions of student answers and the results of interviews, the level of understanding of class XI IPA-3 students tends to be a multistructural level, where students are able to

understand the questions and plan appropriately but have not been able to solve the questions properly and correctly.

## 6. Reference

- [1] Abdurrahman, Mulyono.2009. *Pendidikan bagi Anak Berkesulitan Belajar*. Jakarta: Rhineka Cipta
- [2] Arikunto, Suharsini. 2010. *Prosedur Penelitian suatu Pendekatan Praktek*. Jakarta: Rhineka Cipta
- [3] Dalyono, M. 2005. *Psikologi Pendidikan*. Jakarta: Rhineka Cipta.
- [4] Hamalik, Oemar. 2010. *Proses Belajar Mengajar*. Jakarta : Bumi Aksara.
- [5] Heruman. 2007. *Model Pembelajaran Matematika*. Bandung: Alfabeta.
- [6] Hudoyo, Herman.1990. *Strategi Mengajar Belajar Matematika*. Malang. IKIP Malang.
- [7] Mudjiono, Dimiyati. 2006. *Belajar dan Pembelajaran*. Jakarta: Rhineka Cipta
- [8] Sudjana, Nana. 2002. *Metode Statistika*. Bandung: Tarsito.
- [9] Sudjana, Nana.2010. *Dasar-dasar Proses Belajar Mengajar*. Bandung: Sinar Baru Algensindo.
- [10] Sugiono. *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabet.
- [11] Tim Dosen UNITA.2007. *Perkembangan Peserta Didik*. Siborongborong.
- [12] Rasyid.2009. "Teori Hasil Belajar Menurut Para Ahli".(<https://www.slideshare.net/ismdn/teori-hasil-belajar-menurut-para-ahli>).
- [13] Lorin W. Anderson & David R. Krathwohl.2014.*Pembelajaran, Pengajaran, Dan Asesment*.Yogyakarta: Pustaka Pelajar.

