



Analysis of Mathematics Learning in Junior High School Linear Function Material with Mind Mapping Based On Gender

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Analysis of Mathematics Learning in Junior High School Linear Function Material with Mind Mapping Based On Gender

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Abstract. This study aims to analyze the differences between male and female students in mathematics learning linear function material using Mind Mapping. This study applies a collaborative lesson study between mathematics teachers and researchers. This type of research is descriptive qualitative. The research sample consisted of 8 students, 4 male students and 4 female students of class VIII MTS N 1 South Lampung. Data collection was obtained through methods of observation, interviews, field notes and documentation. The results of the study note that mind mapping of linear function material made by male groups is more creative than female student groups, understanding the concept of linear function of female students is better than male students, and from interviews shows both male and female students feel more excited about learning to use mind mapping.

1. Introduction

Mathematics is one of the subjects taught at all levels of education which has a very important role in mastering science and technology. Mathematics cannot be separated from everyday human life. Mathematics learning as we experience it still emphasizes direct learning which is generally dominated by the teacher, students are still passively accepting what is given by the teacher, generally only one direction. Some experts say that in mathematics learning students generally watch their teacher solve questions on the board. Transmission learning patterns still dominate the classroom, for example the teacher introduces general rules in mathematics and continues with giving practice questions.

Linear functions are complex and diverse ideas whose strength and wealth penetrate almost all fields of mathematics [1]. In school curricula, functions are taught at the elementary level (line graphs, bar graphs, and circle graphs, etc.) to the intermediate level, where these advanced topics are usually explored in depth [2]. Bardini dan Stacey [3] explain that learning linear function aims to enable students to identify the structure of two related variables. In this case, students understand x can vary in the value it represents and the value of y or $f(x)$ depends on the value of x . Kilpatrick dan Izsak [4] explained that students still face many challenges in learning algebra, one of which completes functions. Many students still have difficulty understanding linear functions, making it possible to make mistakes when answering questions. Mistakes that are often made by students in completing linear functions are a lack of understanding of variables, coefficients, and constants as well as errors in reading questions both ordinary questions and story problems [5]. Students also have difficulty in transforming linear functions into a graph, this is caused by the level of thinking of students who are still at a concrete level [6]. The difficulty of students is also in operating arithmetic operations that involve variable functions and are unable to draw conclusions.

Mind mapping is a fun method of note taking because it involves a variety of images and colors in the manufacturing process. Notes made by students are generally only a collection of words written in a linear fashion, which only involves the left brain. The existence of mind mapping will combine the two brain functions because it involves images and colors as aspects of the right brain [7]. Mind mapping can store more visual and spastial information [8] than ordinary note-taking techniques because mind

mapping uses images that can mean more than 1000 words [9] and the human brain remembers images better than just words [10]. Pinto [11] states the mind mapping model has several advantages and disadvantages. The advantages of mind mapping models are that they are quickly understood, can generate ideas, can help organize existing ideas, and hesil mind maps can be used as writing guides. The weakness of the mind mapping model is that only active students are involved in learning, students do not fully utilize group time for learning and discussion, and the information included in mind maps cannot be detailed. In addition, learning with mind mapping makes students actively involved in learning. Rijal Darusman [12] with the steps of learning with a mind mapping model, namely a) the teacher conveys the learning objectives and subject matter; b) students learn the concept of material according to the teacher's guidance; c) forming groups to make mind maps; d) presentation of mind map results by students; e) make conclusions and practice questions individually.

In addition to paying attention and considering active and fun learning strategies such as mind mapping, educators also need to pay attention to the involvement of other factors. Unique and different characters are common when students are in different age groups. But the reality is not always the case, these differences also tend to be found in the same age group. One of the differences in the same age group is gender differences [13]. Gender differences are often not considered by educators in the learning process so that the resulting gap arises between the achievement of learning outcomes of both sexes. Yet in the learning process, educators should treat both sexes equally [14]. Educators should also be able to ensure that the learning strategies applied are appropriate for both sexes. Female gender shows higher critical thinking skills than male gender [15]. There is also research which states that men have higher critical thinking skills than women [16].

Based on the description above, it is necessary to know mathematics learning in linear function material with mind mapping based on gender.

2. Methods

This research was conducted at MTS N 1 South Lampung. This study applies a collaborative lesson study between mathematics teachers and researchers. This type of research is descriptive qualitative. The research sample consisted of 8 students, 4 male students and 4 female students of class VIII. Data collection was obtained through methods of observation, interviews, and documentation.

The observation method is used to observe mathematical learning activities on linear function material with mind mapping based on male and female groups. The interview method is used to obtain some data or to strengthen some important data that cannot be found by observation. Documentation as a curriculum vitae is used to check the validity of the data found by observation interviews. In this study, researchers are the main instrument for collecting data.

Data collected from observation, documentation and interviews were analyzed using steps consisting of data condensation, data display, and conclusion drawing / verification [17]. Interviews and observations are then summarized, and triangulated with documentation. The results were finally concluded as empirical data about mathematics learning in linear junior secondary school functions with mind mapping based on gender.

3. Result and Discussion

3.1 Result

The results of the study note that mind mapping of linear function material made by male groups is more creative than female student groups, it can be seen in Figure 1 results of male student groups and Figure 2 of female student groups. The mind mapping results of male student groups are more creative with pictures and colors than those of female students.

Figure 1

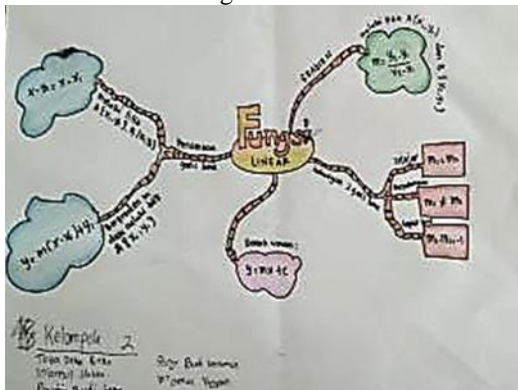
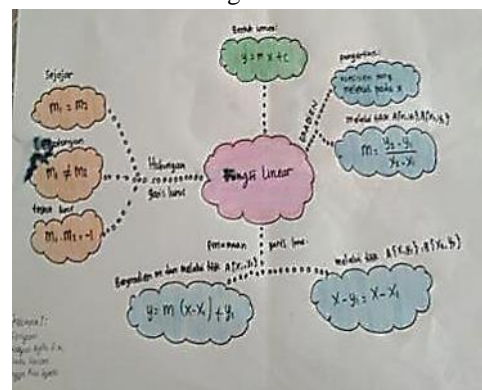


Figure 2



Each group explains the purpose of the mind mapping they have made and the teacher give questions about linear functions, groups of female students can answer questions better than groups of male students, this shows that understanding the concept of linear functions of female students is better than male students.

During the Interview, male and female students gave similar answers. They are more excited and happy when learning to use mind mapping, because of their drawing and coloring activities, then they can remember a little about the material's linear function without memorizing the material.

3.2 Discussion

This analysis illustrates that male students have better creative skills than female students. This consistent with the results of research that has been done shows that there is a relationship between sex differences with creative thinking skills where men tend to have better creative thinking skills than women [18]. On understanding concepts, female students are better than male students. Dagun [19] argues that girls have higher scores in certain fields than boys. Verbal abilities of women are better than men, even though their spatial ability is low.

According to some experts, a person's intelligence level can be classified based on gender. Every male and female student has different intelligence. The assumption arises that in general male students lie in their intelligence (more dominantly using the right brain), while female students generally have intelligence in the academic field (more dominantly using the left brain). Actually, this assumption arises because of differences in the size of different parts of the brain of men and women. Alao and Abubakar [20] argue that gender roles influence familiarity with academic content, career aspirations, attitudes toward subjects, teacher expectations and preferred approaches and this in turn influences academic performance.

Although the results on the mind mapping made and conceptual understanding there are differences between groups of male and female students, with groups of male students are superior in making mind mapping and conceptualization of female student groups better, but in interviews it is known that both male students Both male and female students claimed to be more enthusiastic and happy to learn with learning activities using mind mapping.

4. Conclusion

From the results of mathematics learning analysis of junior high school linear function material with mind mapping based on gender, the researcher concludes that male students have better skills than female students, the understanding of female students' concepts is better than male students and male students and female students more excited and happy with learning using mind mapping. This shows that mind mapping is fun learning and can be applied by teachers in learning in the classroom.

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