

# Students' SPLTV Problem Solving Ability Through Brain Based Learning (BBL) Model in Terms of Learning Style

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## ABSTRACT

The research aims to determine the SPLTV problem solving ability of students with Visual, Auditory, and Kinesthetic learning styles through the Brain Based Learning (BBL) Learning Model. The method used is descriptive qualitative. The population in this study were students of SMAN 7 Kediri City with the sample in this study were 6 students of class X-5. The sampling technique used was purposive sampling. The data collection instruments in the study were learning style questionnaires, tests, and interviews. Based on the results of data analysis, it is concluded that students with visual learning styles have good problem solving skills and tend to emphasize important information with special marks and write down information in detail. Meanwhile, auditory learning style students have good problem solving skills by relying more on memory. Then, students with kinesthetic learning styles have problem solving skills in the good category and accompanied by body gestures.

**Keywords:** *problem solving ability, BBL (Brain Based Learning) learning model, learning styles*

## INTRODUCTION

Mathematics is one of the scientific fields that plays an important role in the advancement of science and technology so

that effective learning is needed in the process of learning mathematics. In the process of learning mathematics involves the development of a thinking process that allows a person to reason towards an understanding (1). Therefore, it is expected that every student takes math lessons and masters mathematical concepts to be applied in everyday life. Problem solving ability is one of the goals that must be achieved in learning mathematics (2). Problem solving ability is also one of the higher order thinking skills. This is because when a goal or end result cannot be achieved immediately, students must use one or more problem-solving processes (3).

Based on observations made at SMAN 7 Kediri City in the 2023/2024 school year, the results of the mathematics exam scores of students in class X - 5 on SPLTV material are still relatively low. This supports the results of the PISA 2022 conducted by Indonesian students. The 2022 Program for International Student Assessment (PISA) research results were recently announced on December 5, 2023, and Indonesia ranked 68th with scores; mathematics 379, science 398, and reading 371 (4). Overall, the PISA 2022 results can be categorized as among the lowest. Based on this, it can be said that students' ability to solve problems is still limited. The application of learning models aims as a signpost for a teacher in the learning process when they carry out the learning process (5).

The lack of practice in solving problems related to mathematical problem solving during the learning process will result in the lack of development of students' brains and can result in students' problem solving skills being low (6). To overcome these problems, innovations in learning must be developed that support students to develop their problem solving skills (7). The application of student-oriented learning models can improve students' problem solving skills (1). One of the learning models that can improve students' math problem solving skills is the Brain Based Learning (BBL) learning model. The Brain Based Learning (BBL) learning model or learning that involves the brain's ability in the learning process which is in line with the brain's function to learn which is scientifically described, not oriented to one point but focused on student satisfaction and liking for learning which results in students being able to quickly assimilate the knowledge conveyed (8). The Brain Based Learning (BBL) learning model can encourage students to think critically and aims to maximize brain performance so as to improve students' problem solving skills. In addition, in order for students' mathematical problem solving ability to increase, the learning style of students must also be considered (9).

Learning style is a method or pattern of learning that is considered the most comfortable applied by students in digesting, remembering, absorbing, and receiving knowledge or information provided (10). The way a person organizes, processes, and responds to information to solve problems is referred to as a learning style (11). Three types of learning style categories found in students include: visual, auditory, and kinesthetic (12). Students are categorized as having a visual learning style when learning through vision, students are categorized as having a learning style if auditory learning through hearing, and students are categorized as having a kinesthetic learning style when learning accompanied by body gestures (9). Based on the problems that have been described, a deeper study is needed to

analyze students' problem solving abilities based on the application of the BBL model in terms of students' learning styles. The research conducted was entitled "Analysis of Students' SPLTV Problem Solving Ability Through the Brain Based Learning (BBL) Learning Model in Review of Learning Styles". The purpose of this study was to determine the problem solving ability of SPLTV material of students with Visual, Auditory, and Kinesthetic learning styles through the Brain Based Learning (BBL) Learning Model.

## LITERATURE REVIEW

### Problem Solving Ability

Problem solving ability can be interpreted as a skill that must be mastered by students to solve mathematical problems in the challenges of everyday life. Due to the fact that one of the five basic talents, math problem solving skills is a primary need and must be learned by all students (13). According to Polya, the indicators of students' ability to solve math problems are: understanding the problem, making a plan, implementing the plan, and re-examining the solution that has been done (14).

### Brain Based Learning (BBL)

Based on Lestari & Yudhanegara (8) Brain Based Learning (BBL) or learning that involves the brain's ability in the learning process which is in line with the brain's function to learn which is scientifically described, not oriented at one point but focused on student satisfaction and liking for learning which results in students being able to quickly assimilate the knowledge conveyed. The Brain Based Learning (BBL) learning model encourages students to have a critical mindset and aims to maximize brain performance, which will improve students' ability to solve a problem. The steps of the Brain Based Learning (BBL) learning model will encourage students to actively use their brain power to overcome problems relevant to everyday life. Therefore, giving students questions about problem solving during the learning process by applying the Brain Based

Learning (BBL) learning model is very important because it will test their cognitive abilities and help them develop problem solving skills (15). In the Brain Based Learning (BBL) learning model, Eric Jensen describes the learning steps (16), including: Pre-exposure, preparation, initiation and acquisition, elaboration, incubation and memory entry, verification and confidence checking, Celebration and integration.

**Learning Style**

Learning style is a method or pattern of learning that is considered the most comfortable applied by students in digesting, remembering, absorbing, and receiving knowledge or information provided (10). Therefore, learning style can be defined as a strategy applied in the thinking process used to process information received, captured, organized, and processed. Three types of learning style categories found in students include: visual, auditory, and kinesthetic (12). Students are categorized as having a visual learning style when learning through vision, students are categorized as having a learning style if auditory learning through hearing, and students are categorized as having a kinesthetic learning style when learning accompanied by body gestures (9).

**MATERIALS & METHODS**

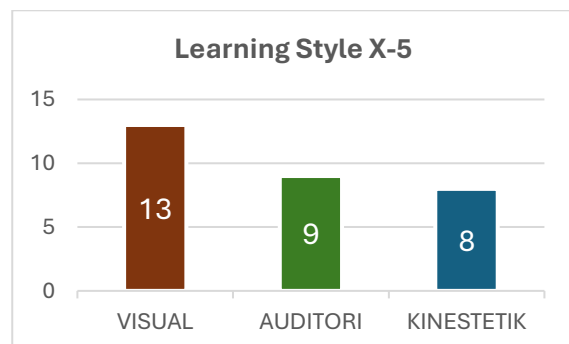
The type of method used in this research is descriptive qualitative research. In the implementation of this research was observed and carried out directly by the researcher. The research was conducted at SMAN 7 Kediri City in class X-5. The research subject was determined by purposive sampling method. Purposive sampling is a method of determining research subjects based on a consideration (17). Determination of this research subject was obtained based on the results of the learning style questionnaire grouping and the direction of the X-5 class mathematics teacher towards communicative students who were allowed to become research subjects, then in the selection of research subjects each learning style group will be taken randomly each 2 students who will be used as research subjects. The instruments used in the implementation of research include: questionnaires, teaching modules, tests, interview guidelines, and researchers. Indicators of problem solving ability are used to assess students' concept understanding ability. Criteria for assessing problem solving ability after being modified from (20) can be seen in table 1.

**Table 1 Indicators of SPLTV Problem Solving Ability**

Aspect	Indicator
Understand the problem	Learners write and describe the data in the given SPLTV problem.
Solution Planning	Learners are able to determine the formula/plan used to solve the given SPLTV problem.
Problem solving	Learners implement the plan that has been chosen to solve the given SPLTV problem.
Evaluation	Learners check the stages of problem solving and the accuracy of the results obtained.

**RESULT**

After conducting research at SMAN 7 Kediri City in class X-5 which amounted to 30 students in one class. Based on the results of data analysis from filling out the learning style questionnaire, 13 students with visual learning styles, 9 students with auditory learning styles, and 8 students with kinesthetic learning styles were obtained.



**Chart 1 Learning Style Results X-5**

After filling out the questionnaire, then the application of the Brain Based Learning (BBL) learning model on SPLTV material was carried out. The application of the Brain Based Learning (BBL) learning model in the learning process begins with the pre-display stage, preparation stage, initiation and acquisition stage, elaboration stage, incubation and memory coding stage, verification and confidence checking stage, and finally the celebration and integration stage. Based on a series of research stages, it is produced:

### 1. Visual Learning Style

#### a) Subject V<sub>1</sub>

Handwritten solution for Subject V<sub>1</sub> showing the elimination method for a system of three linear equations in three variables (SPLTV). The equations are:

$$\begin{aligned} \text{Fitri} &: 5 \text{ manggis} + 2 \text{ anggur} + 1 \text{ sawo} = 190.000 \\ \text{Tita} &: 2 \text{ manggis} + 3 \text{ anggur} = 130.000 \\ \text{Gendhis} &: 2 \text{ manggis} + 3 \text{ sawo} = 70.000 \end{aligned}$$

The solution proceeds by eliminating variables step-by-step. It starts with equations (1) and (2) to eliminate manggis, then uses equations (1) and (3) to eliminate manggis again. The final values are: manggis = 20.000, anggur = 30.000, and sawo = 10.000.

Figure 1 Problem Solving Results on SPLTV Problem Subject V<sub>1</sub>

From the conduct of interviews with subject V<sub>1</sub> on the resulting problem:

P: "From the problem provided, how do you solve the problem?"

V<sub>1</sub>: "I understand the problem first, then I write down the existing data"

P: "After you know the known data information, what is the next plan you will do?"

V<sub>1</sub>: "I made a memorization first ma'am."

P: "What is your plan to solve the math model?"

V<sub>1</sub>: "By eliminating x and y and finding x, then I substitute x and find the value of z,

after finding the x and z values, I substitute them into the first equation and find the value of y."

P: "From the conclusion you wrote, is it correct?"

V<sub>1</sub>: "Yes ma'am, I'm sure"

Based on the test results, subject V<sub>1</sub> was able to complete the steps of problem solving ability correctly starting with the stage of understanding the problem written correctly, at the stage of writing the problem solving plan written by making a memorization to determine the mathematical model, the stage of implementing the problem solving plan was carried out by eliminating and substituting, and at the stage of re-examining the results of his work by including the final conclusion done. The answer sheet is written in detail and neatly, making it easier to see.

#### b) Subject V<sub>2</sub>

Handwritten solution for Subject V<sub>2</sub> showing the elimination method for a system of three linear equations in three variables (SPLTV). The equations are:

$$\begin{aligned} \text{Fitri} &: 5 \text{ manggis} + 2 \text{ anggur} + 1 \text{ sawo} = 190.000 \\ \text{Tita} &: 2 \text{ manggis} + 3 \text{ anggur} = 130.000 \\ \text{Gendhis} &: 2 \text{ manggis} + 3 \text{ sawo} = 70.000 \end{aligned}$$

The solution proceeds by eliminating variables step-by-step. It starts with equations (1) and (2) to eliminate manggis, then uses equations (1) and (3) to eliminate manggis again. The final values are: manggis = 20.000, anggur = 30.000, and sawo = 10.000.

Figure 2 Problem solving results on the SPLTV problem of Subject V<sub>2</sub>

From conducting interviews with subject V<sub>2</sub> at the stage of understanding the problem resulted:

P: "From the problem provided, how do you solve the problem?"

V<sub>2</sub>: "I first look at the problem, then look for the known and asked data."



P: "Why do you mark certain parts of the answer sheet?"

V<sub>2</sub> : "The mark is to delimit between step 1 and another step, and to mark that it is the answer."

P : "What is your plan to solve the math model?"

V<sub>2</sub>: "Pretend mangosteen x, grape y, and sapodilla z. Then I made an equation. Then I eliminated the equation that has the same variable, then I substituted it."

Subject V<sub>2</sub> was able to complete the stages of problem solving skills correctly. At the stage of implementing the plan using a limiting scheme between step 1 and the next step, emphasizing the eliminated variable by crossing out the variable, and when writing the final result of solving the problem, it is always given a special mark indicating that it is the answer.

## 2. Auditory Learning Style

### a) Subject A<sub>1</sub>

Figure 3 Problem Solving Results on SPLTV Problem Subject A<sub>1</sub>

From the conduct of interviews with subject A<sub>1</sub> in solving the resulting problem:

P : "From the problem provided, how do you solve the problem?"

A<sub>1</sub>: "I read what is asked, then look for the data needed"

P : "What is your plan to solve the math model?"

A<sub>1</sub>: "For the steps themselves I used the elimination and substitution method to find the price per kg. So I generalized the fruits into variables, for mangosteen itself as variable x, grapes as y, and sapodilla as z. Then write the equation ma'am. Then write the equation ma'am, Fitri 5x+2y+z=20,000, Tria 2x+3y=130,000, and Gendhis 2x+3z=70,000"

P: "Once the equation or math model is known, what is your plan to solve the math model problem?"

A<sub>1</sub>: "After I determine the mathematical model into an equation, then I eliminate and substitute the equations so that the variables are known for their respective prices."

P : "From the conclusion you wrote, is it correct?"

A<sub>1</sub>: "Yes, I'm sure"

Based on the test results subject A<sub>1</sub> was able to complete all stages of problem solving ability but at the stage of understanding the problem subject A<sub>1</sub> was not written down. However, when the interview was conducted, he was able to describe the stage of understanding the problem with tept and detail.

### b) Subject A<sub>2</sub>

Figure 4 Problem Solving Results on SPLTV Problem Subject A<sub>2</sub>

From the interview with subject A<sub>2</sub> in solving the resulting problem:

P : "From the problem provided, how do you solve the problem?"

A<sub>2</sub>: "I understand the question first"  
 P : "After you know the known data information from the problem, what is the next plan you will do to solve the problem in the problem?"  
 A<sub>2</sub>: "I use elimination and substitution to find the price of each. Let's assume mangosteen x, grape y, and sapodilla z"  
 P : " What is your plan to solve the math model?"  
 A<sub>2</sub>: "Determine the math model"  
 P: "In determining the mathematical model, did you have any difficulties? "  
 A<sub>2</sub>: "Initially yes"  
 P : " Where were the obstacles?"  
 A<sub>2</sub>: " Not being able to list the fruits one by one and their prices, because I didn't really understand the material"  
 P : "At the end, did you write the conclusion of the results you did?"  
 A<sub>2</sub>: "I wrote down the conclusion, which is mangosteen 20,000 per kg, grapes 30,000 per kg, and sapodilla 10,000 per kg."  
 Based on the test and interview results, subject A<sub>2</sub> was able to solve the problem according to the stages of problem solving ability, but experienced confusion at the stage of writing a solution plan. Meanwhile, in the interview, subject A<sub>2</sub> was able to explain the results of his work.

### 3. Kinesthetic Learning Style

#### a) Kinesthetic k<sub>1</sub>

$x = \text{Manggis}$   
 $y = \text{Anggur}$   
 $z = \text{Sawo}$

$$\begin{cases} 5x + 2y + z = 170.000 \\ 2x + 3y = 130.000 \\ 2x + 3z = 70.000 \end{cases}$$

$$\begin{array}{r} \textcircled{1} \quad 5x + 2y + z = 170.000 \\ \textcircled{2} \quad 2x + 3y = 130.000 \\ \textcircled{3} \quad 2x + 3z = 70.000 \end{array}$$

$$\begin{array}{r} \textcircled{1} \quad 5x + 2y + z = 170.000 \\ \textcircled{2} \quad 2x + 3y = 130.000 \end{array} \quad \times 3 \quad \begin{array}{r} 15x + 6y + 3z = 510.000 \\ \underline{6x + 9y + 3z = 390.000} \\ 9x - 3y = 120.000 \end{array}$$

$$\begin{array}{r} \textcircled{1} \quad 5x + 2y + z = 170.000 \\ \textcircled{2} \quad 2x + 3y = 130.000 \end{array} \quad \times 2 \quad \begin{array}{r} 10x + 4y + 2z = 340.000 \\ \underline{4x + 6y + 3z = 260.000} \\ 6x - 2y - z = 80.000 \end{array}$$

$$\begin{array}{r} 2x + 3y = 130.000 \\ 2(20.000) + 3y = 130.000 \\ 40.000 + 3y = 130.000 \\ 3y = 90.000 \\ y = 30.000 \end{array}$$

$$\begin{array}{r} 2x + 3z = 70.000 \\ 2(20.000) + 3z = 70.000 \\ 40.000 + 3z = 70.000 \\ 3z = 30.000 \\ z = 10.000 \end{array}$$

Manggis : 20.000  
 Anggur : 30.000  
 sawo : 10.000

Figure 5 Problem Solving Results on SPLTV Problem Subject k<sub>1</sub>

From the interview with subject k<sub>1</sub> in solving the resulting problem:  
 P : "From the problem provided, how do you solve the problem?"  
 k<sub>1</sub>: "I read the problem first, then look for the data needed"  
 P: "Why did you look at the ceiling during the interview?"  
 k<sub>1</sub>: "I imagined the problem that occurred in the problem ma'am"  
 P : " What is your plan to solve the math model?"  
 k<sub>1</sub>: "I made an analogy, namely mangosteen x, grape y, and sapodilla z. Made an equation"  
 P: "Once the equation or math model is known, what is your plan to solve the math model problem?"  
 k<sub>1</sub>: "Doing elimination, which is equalizing first which can be eliminated after equalizing then eliminating. The same variables are crossed out and the results will be eliminated again."  
 P : " From the conclusion you wrote, is it correct?"  
 k<sub>1</sub>: " Sure mom"

Based on the test results, subject k<sub>1</sub> was able to solve the problem starting with understanding the problem, writing a plan, implementing the plan, and evaluating. During the interview, subject k<sub>1</sub> tended to look at the ceiling to imagine the problems contained in the problem. While on the answer sheet the writing is more dominant using symbols.

#### b) Kinesthetic k<sub>2</sub>

$x = \text{manggis}$   
 $y = \text{anggur}$   
 $z = \text{sawo}$

$$\begin{cases} 5x + 2y + z = 170.000 \\ 2x + 3y = 130.000 \\ 2x + 3z = 70.000 \end{cases}$$

$$\begin{array}{r} \textcircled{1} \quad 5x + 2y + z = 170.000 \\ \textcircled{2} \quad 2x + 3y = 130.000 \\ \textcircled{3} \quad 2x + 3z = 70.000 \end{array}$$

$$\begin{array}{r} \textcircled{1} \quad 5x + 2y + z = 170.000 \\ \textcircled{2} \quad 2x + 3y = 130.000 \end{array} \quad \times 3 \quad \begin{array}{r} 15x + 6y + 3z = 510.000 \\ \underline{6x + 9y + 3z = 390.000} \\ 9x - 3y = 120.000 \end{array}$$

$$\begin{array}{r} \textcircled{1} \quad 5x + 2y + z = 170.000 \\ \textcircled{2} \quad 2x + 3y = 130.000 \end{array} \quad \times 2 \quad \begin{array}{r} 10x + 4y + 2z = 340.000 \\ \underline{4x + 6y + 3z = 260.000} \\ 6x - 2y - z = 80.000 \end{array}$$

$$\begin{array}{r} 2x + 3y = 130.000 \\ 2(20.000) + 3y = 130.000 \\ 40.000 + 3y = 130.000 \\ 3y = 90.000 \\ y = 30.000 \end{array}$$

$$\begin{array}{r} 2x + 3z = 70.000 \\ 2(20.000) + 3z = 70.000 \\ 40.000 + 3z = 70.000 \\ 3z = 30.000 \\ z = 10.000 \end{array}$$

Manggis : 20.000  
 Anggur : 30.000  
 sawo : 10.000

Figure 6 Problem Solving Results on SPLTV Problem Subject k<sub>2</sub>

From the interview with subject  $k_2$  in solving the resulting problem:

P : "From the problem provided, how do you solve the problem?"

$k_2$ : "I first understand the problem in the problem"

P: "Why couldn't you keep your hands still during the interview?"

$k_2$ : "Because I think more easily when my hands or feet are moving mom"

P : " What is your plan to solve the math model?"

$k_2$ : "Let's suppose  $x$  grapes,  $y$  grapes, and  $z$  sapodilla. Then make an equation"

P: "Once the equation or math model is known, what is your plan to solve the math model problem?"

$k_2$ : "I will use elimination and substitution."

P : " From the conclusion that you wrote down, is it correct?"

$k_2$ : " Sure mom"

Based on the test results, subject  $k_2$  solved the problem by applying the stages of problem solving skills appropriately. On the answer sheet the solution steps are written regularly. Meanwhile, when conducting interviews and working on problems, the hands or feet of subject  $k_2$  could not stay still.

## DISCUSSION

The application of the Brain Based Learning (BBL) learning model greatly affects students' problem solving skills. Before the Brain Based Learning (BBL) learning model was applied in the learning process, the condition of students in the classroom was that many students were sleepy and lacked enthusiasm in receiving learning material. Meanwhile, after the application of the Brain Based Learning (BBL) learning model, students' brains develop more rapidly, because with brain exercises in the learning process, students' brains become more relaxed so that students' concentration and memory will increase in receiving learning material delivered by the teacher (8). The application of the Brain Based Learning (BBL) learning model in the learning process also makes students actively conduct experiments to analyze a problem, often

participate in group discussions, and actively present the results of group discussions, and students will feel confident in their ability to solve a problem so that students' problem solving skills will improve (16). Therefore, it can be concluded that the application of the Brain Based Learning (BBL) learning model is able to improve students' problem solving skills in solving a problem contained in the learning process.

In general, all research subjects have good problem solving skills. The results of each learning style group on the research subject will be discussed by the researcher as follows:

### 1. Visual Subject

In understanding the problem, the visual subject reads first and then looks for known data and what is asked, plans the solution by marking important things with special marks, carries out the plan in a predetermined manner, and looks back by writing down the answers that have been determined late. This is in line with the case study conducted by (14) in 2018 which states that subjects with visual learning styles are able to complete the stages of understanding the problem, the stages of determining the plan, the stages of carrying out, and the stages of checking back. Meanwhile, based on the results of the implementation of the interview, students answered the questions given slowly and briefly, while when viewed from the answer sheet the problem solving was described in detail. The results of the assessment carried out by this researcher are also in line with the results of research conducted by (19) which explains that students who have a visual learning style like to describe things in detail through writing and emphasize something important using different colors and stable. The handwriting of students who have a visual learning style is also neat and easy for others to understand.

### 2. Auditory Subject

Based on the data obtained, the Auditory subject in understanding the problem begins by finding the data needed to solve



the problem, planning the solution by connecting what is asked with the data obtained, implementing the predetermined plan, and re-examining the results of his work by writing the conclusion of the problem. This is in line with the study conducted by (20) which found that auditory students were able to complete a series of problem solving stages well. On the answer sheet to the results of solving the test problem, the auditory learning style subject wrote the answer briefly or less than the conclusion. auditory learning style subjects write answers briefly or are less able to describe a test problem solving in detail through writing. This is in line with the study conducted by (19) which states that students who have an auditory learning style find it easier to explain directly than to write. Therefore, when an interview is conducted, the auditory learning style subject can provide an explanation of the information found and the steps to solve the problem casually, in detail, and clearly.

### 3. Kinesthetic Subject

Based on the data obtained, the kinesthetic subject understands the problem by reading and understanding the problem first after that looking for known data and what is asked, writing a solution plan after the data is known, implementing the plan from the known data, and checking back by writing the final conclusion of solving the problem. This is in line with the studies carried out by (2) and (21). But it is not in line with the studies carried out by (22) and (20) who obtained the results that the ability to determine the solution of a problem owned by kinesthetic learning style students is still quite low at the stage of determining the plan and implementing the plan to solve the problem. The solution results on the answer sheet are written symbolically and briefly. When the interview was conducted, students with kinesthetic learning styles explained the steps of implementing the plan quite clearly but tended to be accompanied by

body gestures such as moving the index finger on the answer sheet, looking at the sky several times, and while playing with the ballpoint pen. This is in accordance with the assessment that has been carried out by (19) which states that students with kinesthetic learning styles tend to use body movements and imagine linking the problems in the problem with life.

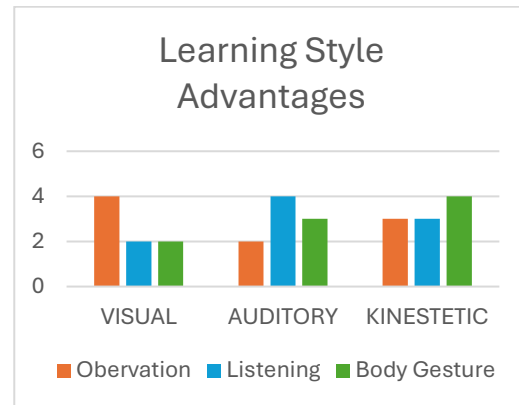


Chart 2 Learning Style Advantages

Visual learning style subjects have an advantage in vision, this can be seen in the use of schemes and special marks in certain parts. Auditory learning style subjects are more dominant in hearing, which is evidenced in the answer sheet for the stage of understanding the problem not written down but when the interview is able to explain. And kinesthetic learning style subjects have more visible body gestures, as evidenced when working on problems and conducting interviews, there are always moving body parts.

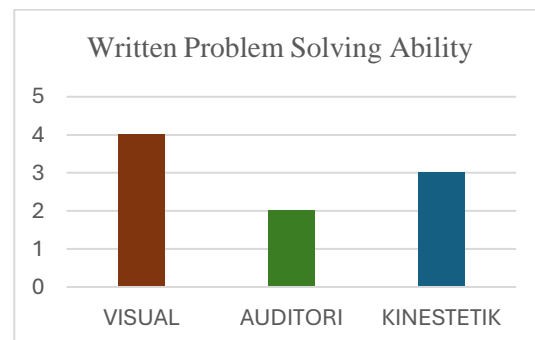


Chart 3 Written Problem Solving Ability

Based on the results of research on written problem solving ability, visual learning style



subjects excel in written problem solving because they write down the steps in detail. Auditory learning style subjects are less good at written problem solving because the completion steps are not included in detail. And kinesthetic learning style subjects are good at solving problems in writing because of the complete writing.

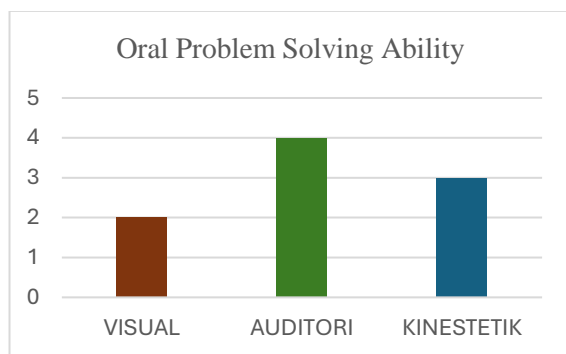


Chart 4 Oral Problem Solving Ability

Based on the research results, the auditory learning style's oral problem solving ability is quite good because it is able to express problem solving orally well, even better than in writing and is able to answer all the steps of solving well. Visual learning style subjects are able to solve problems orally, but are less able to explain well and completely. Kinesthetic learning style subjects were able to answer problem solving orally, but accompanied by body movements and gestures.

## CONCLUSION

Based on the results and data analysis obtained that after applying the Brain Based Learning (BBL) Learning Model, it was found that:

1. Students with visual learning styles have good problem solving skills in solving SPLTV problems are able to go through the stages of problem solving skills, namely understanding the problem, writing a plan, implementing the plan, and checking back. When viewed from the answer sheet of the results of solving problems, visual learning style students tend to use a boundary scheme between step 1 and the next step, emphasizing information by giving special marks.

2. Students with auditory learning styles in solving SPLTV problems are able to go through all stages of problem solving skills. at the stage of understanding the problem Students with auditory learning styles do not write down the data listed and questions contained in the question but when the interview is conducted students with auditory learning styles are able to explain the problem asked. When carried out, they rely more on memory.
3. Kinesthetic learning style students are able to go through the stages of problem solving skills appropriately. The solution results on the answer sheet are written symbolically and briefly. When carried out interviews tend to be accompanied by body gestures.

## Declaration by Authors

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