



The Analysis of Teachers' Difficulties in Teaching Mathematics at SMAN 2 Tambang

Ivan Septian Rahmad ¹, Darmansyah ²

¹ Universitas Riau, INDONESIA

² SMAN 2 Tambang, INDONESIA

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ABSTRACT

Teachers must have teaching skills and create a comfortable, joyful, relax, and serious learning atmosphere. Therefore, teachers must understand the learning process, must be aware of the learners' psychologies, and capable of developing the learners' interest so they have greater spirits to learn. From various problems of teaching mathematics, the teacher's position is the center of the problem. Teachers as motivators, educators, and supervisors have important roles to direct learners to be capable and to actualize them in real life through the school lessons. There are several factors of difficulties experienced by mathematics teachers in implementing learning at SMAN 2 Tambang. This research aims to determine the difficulties experienced by mathematics teachers in implementing learning. This type of writing uses a descriptive qualitative approach. The subjects of this research were teachers at SMAN 2 Tambang. Data collection techniques used interviews and questionnaires. It could be concluded that the most common difficulty was determining the learning media and learning process planning. The cause was the limitation of facilities, infrastructures, and unfordable media by the learners. On the other hand, the next difficulties were due to the large number of learners that could not be accommodated in a small classroom.

Corresponding address:

Ivan Septian Rahmad,
E-mail: ivanseptianr@gmail.com

INTRODUCTION

Education is a medium to develop skills and establish characters and dignified civilizations of a nation. It is important to enrich the life of a nation, to develop learners' potentials to be faithful and *taqwa* human in front of God the Almighty, to have excellent character, to be healthy, reliable, creative, independent, and to be democratic and responsible citizens. Education is important in life and cannot be separated either in an individual, family, national, or state life. The advancement of a nation is determined by the educational advancement of the nation.

John Dewey argues that education is a process to update the meaning of the experience. It may occur during common, parental, or mature interactions and may occur intentionally in institutions to create social connections. Hamdani Ali argues that education has a general meaning. It covers the efforts and action from the older generation to handover their experience, knowledge, reliability, and skill to the younger generation. Thus, the younger generation can keep applying their life function in a mutual relationship [1].

Education is an effort, influence, protection, and assistance given to children with a purpose to prepare their adulthood. It also facilitates them to be capable and reliable to carry out their lives and teacher use discovery learning method. This influence is encouraged by the surrounding adults through their products, such as schools, books, daily life cycles, etc., addressed to younger people.

Education is a process to establish human resources so a human can develop in terms of

religiosity (faith) or society (ethics) in a community. The Constitution of Republic Indonesia Number 20 the Year 2003 about National Education System in Chapter II explains: The national education function is to develop and to foster skills, characters, and dignified civilization to enrich the national life. It aims to develop the potentials of the citizens to be knowledgeable, reliable, creative, independent, democratic and responsible citizens [2].

Problems of education and teaching are complex and involve many influential factors, such as the teachers. Teachers are not only instruments for education as the school building, curriculum, and other facilities are. They are the teaching component with main and crucial roles because they determine the success of teaching-learning activities. Thus, teachers must have teaching skills and create a comfortable, joyful, relax, and serious learning atmosphere. Therefore, teachers must understand the learning process, must be aware of the learners' psychologies, and capable of developing the learners' interest so they have greater spirits to learn. Mathematics a lesson offered for the first time learners get into a school. This lesson is important to prepare them so they can study other disciplines, especially exact science. Moreover, the role of mathematics is widely applied in daily life.

By learning mathematics, learners are expected to [3]:

1. Have skills related to mathematics so they can apply the skills to solve mathematics problems, other lesson problems, or real-life problems.
2. The skills to apply mathematics deal with communication mean.
3. These skills are the ways to reason. They are translated into each condition, such as critical, logical, systematic, objective, honest, discipline thinking in perceiving and solving problems.

From the objective, learning mathematics is important as knowledge and to foster attitudes. Marier argues "Mathematics does not deal with certain object reasoning that may attract an individual's attention instead of other individuals. Mathematics focuses on personal thought because it is not only given in certain education for future jobs but to foster personality. Mathematics has a crucial meaning"

The teacher is a profession needed by the educational world to enrich a national life. A teacher's skills as educational forces both personally, socially, or professionally have to be considered because a teacher promotes education on the field. A teacher is also the spear of educational success. The teacher is the component of the educational system with a *human resource* nature. Thus, many things should be considered for teachers to carry out the tasks and to create a better learning atmosphere. Jawa Pos newspaper reported (May 17, 2004) based on a survey involving 70 learner and college student respondents in Jakarta that most teacher teachings were not understood by them. It was proven by the three top responses from the respondents. This situation occurred due to teachers' lack of material masteries, attitudes, and compromise. Therefore, teachers should consider the matters so that learning could be accepted by learners.

Teachers are professional educational workers who educate, teach, guide, train, assess, and evaluate learners. Teachers are defined as individuals who dev devote to teaching knowledge, educating, directing, and training learners to understand the science or knowledge. Teachers are not only in formal education but also in other domains of educations. They are figures that can be role models by learners. From the explanation, teachers have crucial roles in creating a qualified generation intellectually and characteristically. Prof. Dr. Santoso Murwani of the State University of Jakarta argues that learning mathematics at school is a complex matter. The problem is correlated with each other from the teacher factor, parent, student, learning material, learning objective, and even teacher welfare. Even so, the human resource factor or the teacher factor should obtain more attention because it is the real matter. He also argues that learning mathematics is strongly connected with the

will of the teachers to teach. It is also possible when a teacher knows a mathematics concept well but he is lazy to teach due to a lack of freshness, intelligence, and correctness. Freshness is defined as both physical and psychological readiness to teach.

From various problems of teaching mathematics, the teacher's position is the center of the problem. Teachers as the motivators, educators, and supervisors have important roles to direct learners to be capable and to actualize them in real life through the school lessons. The negative impression of mathematics teachers is considerable critics for them. However, actually, according to Santoso, teachers also have difficulties promoting mathematics learning. The difficulties may rise internally during the teaching activities or externally, the other factors.

The roles of mathematics teachers are important to determine learning success. Therefore, it is important to be reviewed and to determine the solution so that it could function as a suggestion for teachers and observers of this problem. It was the reason the researchers conducted an investigation titled "The Analysis of Mathematics Teachers to Promote Learning at Public SHS 2 Tambang."

Theoretical Framework mathematics is an abstract science and perceived as an instructor to think systematically, critically, logically, carefully, and consistently. Even it is abstract but various concepts and theories of mathematics are based on real phenomena. They are also triggered by the need of solving problems in a real situation. It becomes the principle of why mathematics has important roles in developing other science. This science even directly solves real problems. Therefore, the abstract theoretical and practical aspects of mathematics in a real situation are correlated with each other.

Mathematics symbols are artificial. It means it could only be understood after being defined. Without the symbols, mathematics is only a set of formulas that make individuals lazy to get involved in mathematics. Mathematics also develops its numerical language besides the scientific language. This language will bring quantitative definitions. Because of its importance, mathematics has a specific meaning when individuals need it to interpret a certain matter precisely from various ideas and conclusions.

The word mathematics is derived from *mathematic* (German), *Mathematique* (France), *mathematic* (Italy), *matematicheskii* (Russia), or *mathematics/Wiskunde* (dutch). It is equivalence to a word *mathema*, meaning "learning or something to learn." Reys et al (1984), quoted in [4], found that mathematics dealt with pattern and connection reviews, mindset patten, arts, language, and instruments. Mathematics emerges due to human thoughts related to ideas, processes, and reasons. They consist of four insights, such as arithmetic, algebra, geometry, and analysis. Herman Hudoyo argues that mathematics deals with abstract ideas or concepts arranged hierarchically with deductive reasoning. Learning is a process committed by every individual to gain behavioral changes in cognition, psychomotor, affection, and positive attitudes. They function as experience to gain an impression from the already learned materials. This activity could be done at home, school, nearby environment, other places, and anywhere.

There are two types of thoughts influencing mathematics experts. The first one argues that mathematics seems similar to certain laws of physics in nature while the elements and the laws of mathematics are found by mathematics experts are different compared to the previous one. The second group considers mathematics is created by the experts. It is seen as an art product as if it was a painting painted by an artist (the mathematics expert or mathematician). The definition of learning mathematics and mathematics learning Kimble and Garmezi [4] argue that learning is a behavioral change with a relatively permanent nature as the result of experience. Garry Kingsley argues that learning is an original behavioral change due to experience and training. Learning is a dynamic activity

that allows learners to develop actively. Piaget argues that “knowledge is constructed internally in every individual by actively participating with other individuals.”

Teaching is a purposed activity. It means teaching is an activity connected to certain objectives that are directed to reach the target [5]. If an individual will go to a point of C, it means he will pass several points before C. It means he undergoes a teaching process before reaching the destination, from A and B. Therefore, the target of teaching is a practical guideline about how an educative interaction should be to reach the latest purposes.

It goes both in the family or social group situation, such as in an organization and school. From the definition, teaching should have objectives, generally to change the learners’ behaviors. There are two supporting theories of learning concept: *the conventional and modern learning theories*. The first theory states that learning adds or collects numerous knowledge. If learners are learning, they are analogized as an empty glass and are ready to be filled up with various knowledge [6].

Therefore, the modern argument considers that learning is an individual’s mental activity to change his behaviors from the previous behaviors while being engaged in a new situation. Learning is an effort for learners in the form of activity selection, determination, and optimal methodological and strategic development to reach the preferred learning outcomes [7]. Learning is more general than teaching. He argues that learning can last even the teachers do not stay in the actively [8]. Piaget argues that knowledge is constructed internally in every individual by actively participating with other individuals [9].

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Educator workers must be aware of which teaching method is the most effective to deliver the materials. Many learning method varieties are such as:

1. Lecturing

It is a conventional method by sharing information orally to the learners. Lecturing is the most practicable and economical method, but it has limitations.

Weaknesses:

- a. Passive learners due to spending time listening

- b. Boring activities
- c. Difficulty in achieving the learning due to different learning styles, such as visual learning typed learners
- d. Word definition focus during teaching activities

Strengths:

- a. Teachers can manage the class completely
- b. Teachers can encourage learners to focus
- c. Learning activities are easily promoted
- d. Learners could follow learning activities

2. Discussion Learning Method

This method emphasizes learners' activities to discuss to solve problems. Grouping learners do this method into several group discussions.

Strength:

- a. Encouraging critical thinking skills
- b. Encouraging learners to argue
- c. Training learners to be tolerant and to respect other individuals' argument

Weaknesses:

- a. Dominated by learners who like to speak up
- b. Requiring formal manners to share an opinion
- c. Limited theme given
- d. Suitable for small groups

3. Demonstration Method

This method is realized into practice so learners can directly observe the learned materials. This method is usually interesting and makes learners focused more on the learning materials.

Strength:

- a. Understandable information because of the direct practices
- b. Minimizing misunderstanding possibilities because of the concrete evidence
- c. Learners easily understand the materials taught by teachers

Weaknesses:

- a. Not all materials can be demonstrated
- b. The educators must be aware of the materials
- c. Effective for small learner numbers

4. Advance Lecturing Method

It is similar to the common lecturing method, but it is enhanced by other methods to deliver the learning materials, such as

- a. Advanced question-answer lecturing method
- b. Advanced task-discussion lecturing method
- c. Advanced demonstration-exercise lecturing method

5. Recitation Learning Method

This method requires learners to compose a resume about what had been shared by the educators. It is paraphrased on a paper by every learner.

Strength:

- a. Encouraging learners to write properly
- b. Facilitating learners to remember the materials
- c. Training them to be responsible and full of initiation

Weaknesses:

- a. Cheating on other peers' resumes or asking other people to work on the resumes
- b. Difficulties in evaluating whether learners understand the resumes

6. Experiment Method

This method is conducted with practicum or laboratory experiment so learners can understand the materials directly

Strengths:

- a. Learners could explore and develop by experimenting
- b. Making learners thinking that the materials could be proven with experiment
- c. Encouraging learners to have scientist spirit to develop knowledge

Weaknesses:

- a. Lack of equipment will hinder learners from doing the experiment
- b. Not all materials could be taught with experiment
- c. This method could be done for certain study in a limited time

7. Study Touring Method

This method uses the surrounding environment or locations that are rich in knowledge. This method also requires direct supervision from the teachers.

Strength:

- a. Having direct interaction with the environment and certain locations
- b. Joyful and interesting learning
- c. Motivating learners to be creative in thinking and arguing

Weaknesses:

- a. Highly cost
- b. Requiring excellent preparation
- c. The activity has to be granted by many parties, such as school, parents, etc.
- d. Safety is the priority since many learners misinterpret it into a vacation activity

8. Cooperative Script Method

This method puts learners and guides them to reach the point of a learning material orally. At the end of the learning, teachers will conclude the learning materials.

Strengths:

- a. Training learners to listen, conclude, and deliver the point of materials
- b. Training learners to be brave and confident in the classroom
- c. Training learners to be active completely

Weaknesses:

- a. It could only be applied in a specific field
- b. It could be done with two groups and two pairs

9. Mind Mapping Method

This method applies ordered thinking of a problem, started from how it happens and how to solve it. This method can improve the analyzing and critical thinking skills to understand the problems from the beginning until the end.

Strength:

- a. Effective and efficient
- b. The appearing new ideas can be put into diagrams
- c. The thinking plots of learners can be more effective, so they will be useful for their lives

Weaknesses:

- a. It requires broader knowledge by reading before applying the method
- b. Not all learners can participate in the activity
- c. Several information details may be missing in the map
- d. Other learners may not understand the map since it contains only the points

10. Inquiry Learning Method

This method encourages learners to be aware of what they have obtained during the learning. This method requires intellectuality and encourages learners to understand what they have learned is something valuable.

11. Discovery Learning Method

This method is done by developing autonomous active learning to have a better understanding. In this case, learners will seek the answers to their questions, so they remember well.

Strength:

- a. Developing cognitive skills
- b. Broader thinking and more autonomous attitude
- c. Improving the motivation and self-confidence of learners by investigating
- d. Improving feedback of learners and teachers

Weaknesses:

- a. Suitable for small group scale
- b. Learners have to be mentally ready in the learning process
- c. Learners pay more attention to the findings than to the skills and attitudes
- d. Not all findings solve problems

12. Role-Playing Method

This method is done by role-playing and involves learners acting out a character or situation. This method trains communication and interaction with other people.

Strengths:

- a. Learners can practice the materials directly
- b. Learners train their confidence by acting a role in front of the class
- c. Learners understand the materials

Weaknesses:

- a. Some learners may not like the activity
- b. Introvert learners will have problems with this activity

Here are some functions of learning methods:

1. Extrinsic Motivation Instrument

Motivation is something to move an individual to do something consciously or unconsciously. It is needed in teaching-learning activities. A learning method functions as an extrinsic motivation instrument to make learners keeping up with the learning process properly.

2. As the Learning Strategy

Every learner will have a different intelligence level even when he is in a top class. The intelligence influences learners' skills to understand the materials. With specific learning methods, learners will be able to understand the knowledge properly. Therefore, every teacher must be aware of the best learning method to be applied.

3. As an Instrument to Reach the Objective

Learning method plays a role as an educational facility. It functions to deliver materials for the learners. Thus, it is an instrument to make learners achieving their objectives. The material deliveries without considering the learning method could reduce the values of teaching-learning activities. Besides that, learners will not be motivated without a proper learning method. It will lead to difficulties in delivering the materials so that the objectives cannot be achieved.

The learning method's main objectives are to develop an individual skill so learners can solve their problems. Here are the objectives of learning:

- a. Developing individual skills to solve problems and to determine an alternative solution
- b. Improving the learning process so that it runs excellently
- c. Facilitating learners to find, examine, and arrange the required data as the attempts to develop other disciplines
- d. Directing to ideal learning accurately, quickly, and appropriately
- e. Allowing the learning process to be joyful and motivated so learners will easily study.

Teachers should understand the appropriate mathematics learning strategy and be able to apply it in classroom teaching. Thus, learners can learn mathematics well. Roth Well argues that learning strategy is a stage of a learning design process. It simply refers to the way to reach the learning process [12]. The learning process is a series of external events for learners. It is designed to improve their internal process of learning [13].

Suharsimi Arikunto divides learning strategy into two stages [14]:

- a. The pre-classroom involvement stage, also known as the preparation or pre-condition stage,
- b. The in-class stage, this stage occurs in a classroom and is known as the operating procedure stage.

The selection of the stages is based on the following considerations:

- a. Learning objectives, types, and levels
- b. The comprehensiveness of the content materials
- c. Background, motivation, and learners' conditions
- d. Numbers, qualification, and teachers' competences
- e. The period and schedule
- f. Facility and fee

Appropriate communication is needed in the learning process to reach the already planned learning. It makes teachers having important roles in the learning process. The teacher refers to a teaching profession. However, for experts, the teacher has various definitions although it refers to a single meaning. Thus, it could be concluded that a teacher is a teaching person. He teaches a certain field or science to other people and expects it to be understood and applied by other people [6]. Therefore, a mathematics teacher is a teacher that teaches mathematics and hopes the learners

understand and apply the science in daily life.

A teacher is a professional job and not everyone can obtain and carry out the task. It is only for those who are already prepared by teaching education for them. The basic capabilities, such as professionalism, intellectuality, and social dedication should be mastered by teachers to educate both in family or community scopes. At schools, teachers have to teach and educate the learners. At home, they are parents while in the community they are the figures that reflect excellent personality. Thus, their behaviors and gestures can be role models for the surrounding individuals [15]. Based on this description, this research aims to determine the difficulties experienced by mathematics teachers in teaching mathematics.

METHODS

The applied method of this research was descriptive analysis. It analyzed the obtained data and information of the research to be interpreted based on reality. The form of research used is descriptive research with a qualitative approach that analyzes errors and what will be analyzed is in mathematics learning. The subjects consisted of the teachers of Public SMAN 2 Tambang. The applied instruments were interviews and questionnaires distributed to the teachers.

RESULTS AND DISCUSSION

Based on the results of data processing, the difficulties experienced by teachers in learning mathematics are as follows.

1. The Difficulties of learning process planning

The data analysis showed three findings dealing with the difficulties. They had significantly high percentages to determine the learning media, to design the learning space, and to determine the assessment procedure. This finding was in line with the applied theoretical framework. The most experienced difficulty was determining the appropriate media for teachers in Ciseeng Islamic Primary School. It was due to the expensive cost of the media so that the learners could not afford it. On the other hand, the school had facility and infrastructure limitations. A teacher should have specific skills to attract learners' interests in mathematics. He should avoid any monotonous material delivery because each material would not be suitable to use the same media.

2. The Difficulties to Communicate with the Learners

The findings described that motivating learners' interests to learn mathematics and fostering their confidence were difficult matters for mathematics teachers in SMAN 2 Tambang. It was due to many learners assumed mathematics was difficult and not interesting. The teachers had attempted to encourage their interest by

- a. Telling those mathematics is a science that required learners to think and analyze problems,
- b. Telling that mathematics is a key to success
- c. Providing applicable examples in daily life
- d. Directing them that mathematics was easy and useful
- e. Becoming a friendly mathematics teacher
- f. Creating a joyful learning atmosphere.

The obtained data were the perspectives telling that mathematics teachers were "grumpy" and "scary" for learners. Thus, it impacted the learners to understand the learning. The important matter was how to make learners feeling comfortable and joyful while learning mathematics. Communication is an answer for learners to respect the teachers without feeling afraid and insisted.

Table 1. The Causes of Difficulties while Communicating with the Learners

Number	Difficulties	Causes	Numbers	Percentage (%)
1	Making learners confident	Feeling incapable to learn	5	25
2	Encouraging learners' interests	mathematics and afraid to commit a mistake	12	60
3	Developing positive attitudes	Difficult and not interesting	1	5
4	Having no difficulties with mathematis	Difficult to understand	2	10
			20	100

Talking about the material problem and how to explain the material properly is very difficult, because people who master the material are not necessarily able to explain the material well and people who can explain the material well sometimes do not fully master the material. Ideally, mathematics teachers (as well as other teachers) should be able to master the material and be able to present the material well. The difficulties that occur above are not something that must be denied, everything must be sought for solutions in order to improve the quality of teaching and become a teacher according to the profession.

Based on the description of the data findings, stimulating and motivating students to ask questions is the most difficulty experienced by mathematics teachers, this difficulty is caused by students not mastering the basics of mathematics, lack of student interest in mathematics, and students are shy and afraid. The cause of this difficulty is because there is too much material while students take a long time to understand the content of the material presented, so sometimes a lot of material is not explained completely. The things that can be done to solve this problem are:

1. Mathematics teachers should use the surrounding media and objects or create personal media to support the materials.
2. They could also invite the learners to learn outside by grouping them into small teams. Thus, learning would not be monotonous in the classroom.
3. Mathematics teachers should provide opportunities for learners to create questions about the materials with their language. Thus, they could communicate, be motivated, and respond.
4. The teachers could use a game to teach mathematics because it influenced significantly the learners' interest in learning mathematics.

CONCLUSIONS AND SUGGESTIONS

It could be concluded that the most common difficulty was determining the learning media and learning spatial design to plan the learning process.

1. The cause was the limitation of facilities, infrastructures, and unfordable media by the learners. On the other hand, the next difficulties were due to the large numbers of learners that could not be accommodated in a small classroom.
2. The most common difficulty for communicating with learners was triggering their interest to learn mathematics. It was due to the learners' thought mathematics was difficult and not interesting.
3. To solve teachers' difficulties, teachers should use the surrounding media and objects or create personal media to support the materials., invite the learners to learn outside by grouping them

into small teams, should provide opportunities for learners to create questions about the materials with their language, use a game to teach mathematics because it influenced significantly the learners' interest in learning mathematics.

This research was conducted limitedly at SMAN 2 Tambang, so the number of samples used was limited, and the results of the study only apply to the scope of the sample. For researchers who are interested in researching the same theme, they can take samples in different environments, for example in other junior high schools or senior high schools.

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BIOGRAPHY

Ivan Septian Rahmad

He was born of Pulau Payung on September 14, 1995. Now he is a student in the Mathematics Education postgraduate program at the University of Riau. Phone number 0822-5327-9036 and email: ivanseptianr@gmail.com

Darmansyah

He was born of Selat Panjang on March 20, 1977. The researcher completed his bachelor Strata-1 (S-1) in 2002 and Strata-2 (S-2) in 2020 at the Riau University. Phone number 0812-7555-5879 and email: darmansyah.math@gmail.com