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Table of Contents

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STUDENT CRITICAL THINKING SKILLS IN THE IMPLEMENTATION OF DISCOVERY LEARNING AND INQUIRY-BASED LEARNING

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ABSTRACT

This study aims to determine the differences in critical thinking skills that are significant in the Basic Concepts of Mathematics course in learning using the Inquiry and Discovery Learning models. This research was a quasi-experimental study with a nonequivalent control group design. The study population was students of the Elementary School Teacher Education Department, Faculty of Education and Teacher Training, Universitas Muhammadiyah Sumatera Utara, with a total of 66 students. The data collection technique used the integrated critical thinking skills rubric instrument of description questions. The data analysis technique used the t-test with the Independent Sample T Test technique. The results of this study indicate that the level of critical thinking skills in learning using the Inquiry model is higher than Discovery Learning. This can be observed from the results of the t-test which shows a probability value of 0.000. By this, the probability value is < 0.05. It means H0 is rejected and Ha is accepted. This means that there are significant differences in the Inquiry and Discovery Learning models for critical thinking skills in mathematics

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1. INTRODUCTION

Rapid progress in the world of technology has had a major impact on the development of education in Indonesia. Considering that the upcoming 4.0 Industrial Revolution requires the adaptability of all components of education, this development must be taken seriously. The Industrial Revolution itself is a challenge to switch from traditional learning systems to modern learning. Every component of education must achieve new breakthroughs that require high creativity. Lecturers play an important role in higher education in fostering student creativity to overcome these challenges. The creativity shown by students is a barometer of their learning progress in class. Students who are very creative tend to be enthusiastic and confident when facing the demands of the Industrial Revolution 4.0.

At the higher education level, especially the Elementary School Teacher Education Study Program (PGSD) Muhammadiyah University of North Sumatra, it embodies the various forms of creativity demanded by the Industrial Revolution 4.0. Each course offered to students is structured from a competency performance perspective that requires creativity. The achievement of these competencies can be seen in the results of individual student learning as a result of creative thinking (Nasution, M.D and Nasution. E, 2018).

Elementary Mathematics Basic Concepts course is one of the courses that students must complete in the second semester. This course will facilitate students' understanding of theory and practice: regional autonomy as a background for KDM, basic concepts of mathematics in elementary schools, management of components of learning mathematics in schools, implementation of basic concepts of mathematics in schools, effectiveness and efficiency of KDM courses.

However, from observations during learning, it turns out that many students are still monotonous in their learning, students only rely on instructions from the lecturer, and do not have the initiative to come up with ideas and ideas in their learning. Moreover, students are accustomed to the conventional learning process, the process of one-way educational activities (Teacher Center). In conventional learning, lecturers are more dominant in controlling the class (Nasution, M.D. 2021).

Elementary Mathematics Basic Concepts course is considered quite difficult because it is a compulsory subject for second semester students who do not have other basic knowledge. A preliminary survey of KDM course students in the 2022/2023 even semester revealed that only 45% of students were self-motivated learners, 53% of students were very curious, and 48% of students had and liked challenges, and only 47% were willing to take risks.

The percentage data shows that students lack initiative, lack curiosity, and do not like challenges. The percentages above are quite serious problems, so a breakthrough is needed in the learning model or method used to increase student creativity in the learning process.

The learning carried out in the Elementary Mathematics Basic Concepts course uses methods and models that are oriented towards conventional learning so that the dominance of the lecturer as a teacher looks more dominant in learning. This makes students become monotonous in learning, students are not motivated to express their opinions and views to argue with each other about the problems they study, causing low student achievement. So, there needs to be a breakthrough and new encouragement in the application of methods or models that encourage students to increase student learning creativity in the Basic Mathematics Concepts course, so that this can have an impact on student learning outcomes (Nasution, M. D., & Sari, E. T., 2019).

Mulyasa, (2011) states that creativity or invention is a personal perception of novelty and value-based evaluation as a result of individual or collective action. From this theory it can be said that the actions of individuals or groups of people can produce new works or develop existing works.

According to Rahmawati and Euis (Rachmawati & Kurniati, 2012) creativity is an act of intelligence associated with discovering something new and being open to new experiences. Student creativity is always synonymous with intelligence, with intelligence they are able to solve problems according to various situations in the learning environment they face, ranging from easy to difficult situations. Students can always find alternative answers to solve a problem in learning.

Mark A and Garrett, (2012) stated "creativity requires both originality and effectiveness". In this case creativity can be seen from two things, namely the problem of originality and effectiveness. So a student is called a creative person if he has fulfilled the elements of originality and effectiveness.

The importance of attractiveness and student creativity in learning requires efforts made by lecturers to encourage mastery of student learning creativity. The impetus for mastering student learning creativity in question is through the application of Inquiry-Based Learning and Discovery-Based Learning.

According to Jerome Bruner (1961), inquiry-based learning is commonly known as discovery learning and science teaching based on inquiry. The process of discovery learning is that they have to identify key principles for themselves rather than just accepting the teacher's explanation. Bruner also believes that a person has three means of achieving understanding, namely enactive, iconic and symbolic ways.

The basic concept in inquiry-based learning is related to the process of personal discovery by students. Learners or student inquiry are guided to ask questions or generate relevant questions and produce appropriate answers through critical thinking. In inquiry learning students are also shown how knowledge is generated, how it is transmitted, and how all parties including experts, lecturers, teachers, parents and the community contribute to students' knowledge. Inquiry-based learning teaches students to respect their own interests and the interests of others (Donham, 2001).

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The fundamental approach to inquiry learning is based on constructivist learning theory. Constructivist learning strategies utilize inquiry-based learning and problem solving through critical and creative thinking. According to Asselin et al (2003) student inquiry is encouraged to explore new ideas and understandings through personal discovery and exploration as well as interactions with objects and other people. Learning is enhanced through opportunities for investigators to engage in real-life activities, situations and with real audiences.

Meanwhile, the discovery-based learning model is a method that encourages students to reach conclusions based on their own activities and observations. This method means students as problem solvers where students collect, compare, analyze information, and conclude it.

Discovery learning is the recommended method of the 21st century. This method allows students to seek information and build their knowledge by doing several activities. Since, Indonesia held a new curriculum. One of the recommended methods includes the discovery learning method. Discovery learning is a suitable method in the 21st century where students must learn actively. This discovery learning method not only helps students increase their academic scores but also this method can make students have a good attitude by carrying out all processes using this method in the teaching and learning process. Continuous discovery learning can help students build their character (Feriyanti, 2014)

From the two Inquiry-based learning and Discovery-based Learning methods, according to Matson (2006) in the journal A.G Balm entitled "The Effects of Discovery Learning on Students' Success and Inquiry Learning Skills", inquiry and discovery-based learning is a process of investigating the nature and structure of the universe. Lecturers only provide stimulus and students try to find conclusions by carrying out several activities such as observation, gathering information, interviews, and others.

2. METHODOLOGY

This study used an experimental research method with Quasi 3 classes. The experimental research motto with Quasi is to measure the difference in responsiveness between the treatment group and the control group which is a measure of the influence of the treatment given to the treatment group (Margono, 2007: 110). The subjects of the research were even semester students in the Elementary School Teacher Education Study Program for the 2021/2022 academic year who took basic elementary math concepts courses. The object of research is student learning creativity. The instrument in this study was in the form of student learning outcomes tests which were demonstrated through student creativity in thinking. The tests given are in the form of essays with Cognitive levels C4 (analysis) and C5 (evaluation) which are given in writing. After the data was obtained, analysis prerequisite tests were carried out, namely the normality test and homogeneity test. After calculating normality and homogeneity, data analysis is carried out to test the hypothesis. The test is intended to determine whether there is a significant difference between student classes using Inquiry-Based Learning, Discovery-Based Learning and Conventional models. This hypothesis test is carried out using the t test formula. The t test was carried out to test the research hypothesis regarding the effect of each independent variable partially on the dependent variable (Ghozali, 2016).

3. RESULT AND DISCUSSION

A. Test the hypothesis of Inquiry-Based Learning model class groups and conventional class groups

The calculation results obtained tcount of -0.28 with degrees of freedom (dk) = (n1 + n2 – 2) = (26 +22 – 2) = 46 then obtained $ttabel$ at a significant level of 0.05 of 1.67666 because tcount< $ttabel$ (-0.28<1.67666) means that $H0$ is accepted and Ha is rejected, so it can be concluded that there is no difference in creativity with the Inquiry-Based Learning model and the creativity of conventional model classes. Meanwhile, when viewed from the results of the N-Gain creativity to determine the level of effectiveness of the Inquiry-Based Learning model and conventional models, it can be seen as follows.

Table 1. Recapitulation of N-Gain Values of Inquiry-Based Learning and Learning Models

Model	N-Gain	Information
Inkuiri-Based Learning	27,00	Ineffective
Conventional	35,00	Ineffective

Based on N-Gain data on learning creativity, both models have N-gain which is in the ineffective category. Even so, the conventional learning model has a greater N-gain value than the Inquiry-Based Learning learning model.

B. Test the hypothesis of Inquiry-Based Learning model class groups and conventional class groups

Based on the calculation results obtained tcount of 1.17 with dk (degrees of freedom) = (n1 + n2 – 2) = (22 + 26 – 2) = 46 then obtained `$ttabel$ at a significant level of 0.05 of 1.65107. Because tcount<ttable (1.17<1.65107) means that H0 is

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accepted, therefore it is concluded that there is no difference in student creativity with the Discovery-based Learning model and the conventional model. Meanwhile, the N-Gain results from creativity to determine the level of effectiveness of Discovery-based Learning models and conventional models are shown as follows:

Table 2. Recapitulation of the N-Gain Value of the Discovery-based Learning Model and the Conventional Learning Model

Model	N-Gain	Information
Discovery-based Learning	62,00	Ineffective
Convensional	35,00	Ineffective

Based on the N-Gain data of learning creativity, the Discovery-based Learning model is a quite effective learning model while the Conventional learning model is categorised as ineffective.

Table 3. Recapitulation of the N-Gain Value of the Inquiry-Based Learning Model and the Discovery-Based Learning Model

Model	N-Gain	Information
Inkuiri-Based Learning	27,00	Ineffective
Discovery-based Learning	62,00	Ineffective

Based on the N-Gain data, the learning outcomes of the Discovery-based Learning learning model are quite effective learning models while the Inquiry-Based Learning learning model is in the ineffective category. Even though Discovery-based Learning has the greatest N-Gain, when viewed from the effectiveness criteria, was seen as follows:

Table 4. Table of categories for interpreting the effectiveness of N-gain

Percentage	Interpretation
< 40	Ineffective
40-50	Less effective
56-75	Effective enough
>76	Effective

Source: Hake, R.R, 1999

So the class with the Discovery-based Learning model only reached the category of quite effective. However, this is better when compared to classes in Inquiry-Based Learning and conventional models which are ineffective criteria. More details are in the following table:

Table 5. Class Group N-Gain Recapitulation of Inquiry-Based Learning, Problem Based Learning, and Conventional Learning Models

Value Summary	**Class Group**		
	Inkuiri-Based Learning	Discovery-based Learning	Convensional
N-Gain	**27,00**	62,00	35,00
Category N-Average gain in percent	Ineffective	Effective enough	Ineffective

Based on the results of hypothesis testing, it was obtained data that there was no difference between learning outcomes in Inquiry-Based Learning, Discovery-based Learning and conventional models. Even so, when viewed from the N-Gain, class learning outcomes using Discovery-based Learning have a greater N-gain than classroom learning outcomes using Inquiry-Based Learning models and conventional models. However, the difference in N-gain is quite thin, making hypothesis testing provide information that there is no difference between the three. This means that the differences are not significant.

There are various factors that can cause no significant difference between each model. Among them is because these models both have good advantages or also have weaknesses. Inquiry-Based Learning is able to create new abilities in

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implementing ways of learning according to the talents of each student. These strengths can actually become weaknesses, because the process requires teachers or lecturers to be more creative in carrying out learning activities. Conditions in Indonesia where it is customary to fill college classes with as many students as possible, of course there will be difficulties in making learning that accommodates the talents of all students.

According to Legowo, (2017) an important key in designing lessons for Inquiry-Based Learning classes is to think about how we translate curriculum content into learning experiences that stimulate students' Inquiry-Based Learning profiles. So success in learning is very dependent on these keys. Whereas conventional learning, which refers to the lecture method with a little discussion, is inevitable about its shortcomings. However, students' familiarity with this model actually makes this model have advantages, namely students are able to adapt to their learning process.

Meanwhile, Discovery-based Learning has advantages, one of which is developing critical thinking skills and increasing students' ability to adapt to new knowledge through problems presented by lecturers. However, the weakness arises when students do not have confidence that they are able to solve the problem being studied so that they are reluctant to try to solve the problem (Setiawan: 2018).

In the experimental class with the Inquiry-Based Learning model, students get a small N-Gain score of 27.00 and are in the ineffective category. In theory, this model should have a significant impact on the N-Gain of learning creativity. If this does not happen, then there may be causative factors that may occur to both students and lecturers. It could be that the class is not optimally explored for its intelligence because students are less active or not serious in following the lesson or filling out the questions. Even so errors or deficiencies can occur in the teacher. There may be missed or missing stages, and other possibilities. But what is certain is that there is no learning model that is truly suitable for all classes. Because each class has different students.

Legowo, (2017) suggests seven stages of learning based on Inquiry-Based Learning theory: (1) focusing on specific goals; (2) formulate key Inquiry-Based Learning questions; (3) consider the possibility of its application; (4) do a brainstorm; (5) selecting appropriate activities; (6) determine the sequence of activity plans; and (7) implement the plan. In this activity the teacher is required to understand the concept of Inquiry-Based Learning and have a variety of knowledge and skills about learning methods, as well as being creative. Misconceptions that occur in lecturers may result in these seven stages not going well. In addition, Armstrong (in Legowo, 2017) also provides an example of a learning guide for the Inquiry-Based Learning model called "*key materials and methods of Inkuiri-Based Learning teaching*".

This classifies the Inquiry-Based Learning learning framework into four dimensions, namely dimensions: (1) intelligence (eight intelligences); (2) learning activities; (3) teaching materials, and (4) learning strategies. So if these stages are not successfully carried out optimally then the possibility of non-optimal learning outcomes is very likely to occur. Or if this model is considered new by students, it is possible that they feel unfamiliar with the stages.

In the N-Gain experimental class, student learning outcomes are in the criteria of being quite effective. This means that the stages of learning in Discovery-based Learning with all its advantages and disadvantages have been able to make students have an adequate increase in learning achievement compared to before (pre-test). The findings of this study are in accordance with the findings of Nur, Pujiastuti and Rahman (Nur et al., 2016) that PBL has a significant effect on increasing learning creativity

Tyas, (2017) explained that the important point of discovery learning is in the application of problems that can encourage and direct the learning process. Discovery-based learning practices utilize small groups (7-10 people) guided by a facilitator. Discovery-based learning itself is based on constructivism theory which holds that learning is a process of self-building new knowledge and experiences based on students' prior knowledge. But even so, the presence of Discovery-based Learning which has been around for a long time and is often used by lecturers can have an impact on improving learning outcomes. So in this case, getting used to the application of certain models is very important to do.

For the control class that uses the conventional model, even though the N-Gain of learning creativity is in the less effective criteria, it is still better when compared to the class in the Inquiry-Based Learning experiment. A very strong factor causing this to happen is because students are used to this model so they can take part in learning in a relaxed manner even though the increase is not that great. It was mentioned earlier that Runco & Jaeger, (2012) stated "creativity requires both originality and effectiveness". So there is no change in student creativity because students are not used to generating new and original and effective ideas. So they prefer conventional learning compared to learning the Inquiry-Based Learning model.

Glaveanu, (2018) said in more detail "*I identify three prototypical ways of defining creativity. The first and most common one, continuing the legacy of the Renaissance and Romanticism, associates creativity with the arts and emphasizes self- expression, originality, and divergent thinking. The second one, related to the ideals of the Enlightenment, connects creativity with science and discovery and brings to the fore its functional, Discovery-based Learning aspects".*

Creativity is also associated with the ability to solve problems. Then the effectiveness in question is explained more about the ability of creativity in providing solutions to a problem. This could be the reason for the research findings which show that classes with the Discovery-based learning model gain higher effectiveness when compared to other classes. This finding also confirms that the creative side will emerge and develop when someone encounters a problem

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4. CONCLUSION

Based on the results of hypothesis testing, it can be concluded that there is no difference in creativity with the use of Inquiry-Based Learning, Discovery-based Learning and conventional models. Even so, if we look at the N-Gain gain in each model, the largest model in a row is the Discovery-based Learning model with an N-Gain of 62. Followed by the N-gain of the conventional class, which is 35. Finally, the N-gain of the Inquiry class -Based Learning, by 27.

When viewed from the N-Gain criteria, the experimental class with the Inquiry-Based Learning model is included in the ineffective criteria. The experimental class with the Discovery-based Learning model is in the criteria of being quite effective while the control class with the conventional model is in the criteria of being less effective.

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ETHNOMATEMATICS EXPLORATION ON GONDANG BATAK MUSICAL INSTRUMENTS ASSISTED BY GEOGEBRA

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ABSTRACT

This study aims to explore the mathematical concepts that exist in the Gondang Batak musical instrument with the help of Geogebra so that it can be implemented in learning. This study used qualitative research with explorative literature related to the Gondang Batak musical instrument. This study's results indicate a flat shape concept and a spatial concept in the Gondang Batak musical instrument. This can also be demonstrated by using Geogebra so that students better understand the mathematical concepts of the Gondang Batak musical instrument. It can be concluded that the Gondang Batak musical instrument can be used as a medium for learning mathematics at the elementary and middle school levels. In addition, students can also learn Batak culture, especially related to the Gondang Batak musical instrument.

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1. INTRODUCTION

Education and culture are two elements that support and complement each other in everyday life. Education plays an important role in cultural inheritance so that cultural values need to be applied in learning. Education as a pillar of culture and culture will develop education (Patri & Heswari, 2022) [1]. In education, of course, many subjects are studied starting from elementary to university level. One of the subjects studied is mathematics. Rahmah's opinion (2013) [2] states that mathematics has several important characteristics, namely (1) having abstract objects, where mathematical objects are facts, concepts, uses and rules used in processes, and (2) having a deductive and consistent mindset. Based on this, it can be stated that mathematics is needed in everyday life and is important to learn.

The fact is that students often find mathematics difficult, too many formulas to memorize and boring. This is one of the factors that influence the low results of students' mathematics learning. The achievement results of Indonesian students when participating in TIMSS 2011 (Rosnawati, 2013) [3] can be seen in Table 1 below :

Table 1. Attainment of Indonesian Students for TIMSS Results

	TIMSS Results 2011				TIMSS Results 2015			
	Low	Medium	High	Elevated	Low	Medium	High	Elevated
Science	54%	19%	3%	0%	54%	15%	6%	0%
Mathematics	43%	15%	2%	0%	54%	15%	6%	0%

From the table it can be concluded that the mathematical ability of Indonesian students is dominant at a low level. Conditions like this should be corrected with optimal effort from teachers and students. It is hoped that students will have the ability and life skills in dealing with the times and technology developments.

In the midst of the development of Science and Technology which is in line with the times, the educational curriculum requires students to have qualified abilities, including abilities in mathematics. Not only that, in the educational curriculum it is also required to have cultural involvement in learning at school. This is intended so that Indonesia's younger generation can recognize and preserve culture as the foundation of the nation's character. Cultural practices allow the embedding of mathematical concepts and recognize that everyone develops a special way of doing mathematical activities which is called ethnomathematics (Fajriyah, 2018) [4]. This is in line with the opinion (Sitanggang, 2020) [5] that culture can be used as a source of learning mathematics that can be used in schools to facilitate learning in class.

One of the cultures in North Sumatra is the Toba Batak culture. Of the many elements in Toba Batak culture, one of the elements that can be used as a source and media for learning mathematics is the Gondang Batak musical instrument. The Gondang Batak musical instruments explored in this study consist of Panggora, Sarune Bolon, Garantung, Taganing, Gondang and Sulim. In each Gondang Batak musical instrument there are different shapes and sizes that can be observed directly. This can be used as a source of learning mathematics.

In teaching mathematical concepts to the Gondang Batak musical instrument, it is best to use visual learning media, namely Geogebra. Geogebra is software designed to assist teachers in instilling material concepts through attractive images and visualizations (Hikmah and Nengsih, 2021) [6]. This is in line with the opinion (Jelatu, Sariyasa2 and Ardana, 2018) [7] that students' understanding of mathematical concepts is better when taught with Geogebra media-assisted learning than conventional (expository) learning. There are several materials that can be taught with the help of Geogebra, including plane shapes, spatial shapes, matrices, straight line equations and algebra. Therefore, this research was conducted to explain the concept of flat shapes and any spatial shapes contained in the Gondang Batak musical instrument. There are several materials that can be taught with the help of Geogebra, including plane shapes, spatial shapes, matrices, straight line equations and algebra. Therefore, this research was conducted to explain the concept of flat shapes and any spatial shapes contained in the Gondang Batak musical instrument.

2. METHODOLOGY

As described above, this research used qualitative research with a literature study method. The data in this study were taken from books, articles, literature, reports and notes relating to the problem to be solved. This research was conducted to explore the ethnomathematics in the Gondang Batak musical instrument.

3. RESULT AND DISCUSSION

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1. Panggora

The Panggora musical instrument is a gong that is played by hitting it with a stick. Panggora has a diameter of 36 cm with a thickness of less than 6 cm (Dwi, 2020) [8].

Figure 1. Panggora

In Panggora, it can be seen that there is a flat geometry concept, that is a circle. By using Geogebra it can be described as follows:

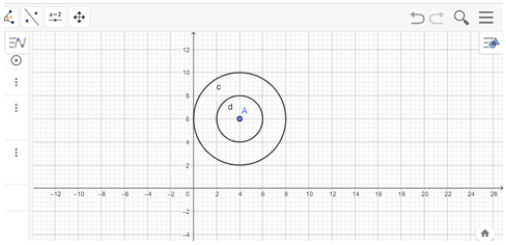

Figure 2. Circle using Geogebra

Through Figures 1 and 2 it can be understood the properties of a circle as follows : (1) a circle only has 1 side, (2) has no vertices, (3) has a central point, (4) the number of angles is 3600, (5) has symmetry fold and infinite rotary symmetry, (6) has a radius and diameter, and (7) has a circumference and area.
In Figure 1, for example, the diameter of Panggora is 36 cm, then it can be determined :

- Panggora's circumference is C. $C = \pi \mathrm{d} = \frac{22}{7} \times 36cm = \frac{792}{7} = 113{,}14cm$
- Area of Panggora is A. $A = \pi r^2 = \pi(\frac{1}{2}d)^2 = \pi\frac{1}{4}d^2 \rightarrow A = \pi\frac{1}{4}(36)^2 = \frac{22}{7}\frac{1}{4}(1296) = 1018{,}28\ cm^2$

2. Sarune Bolon

Sarune Bolon is a wind instrument that is useful for carrying melodies.

Figure 3. Sarune Bolon

Sarune Bolon is made of bamboo with holes at both ends with a length of 10-12 cm and a diameter of 1-2 cm. In Sarune Bolon there are 6 holes of different sizes (Dwi, 2020) [9]. In Sarune Bolon, it can be seen that there is a flat geometric concept, namely an isosceles triangle and a circle. There is also the geometric concept of a geometric shape, that is a cone. By using Geogebra it can be described as follows:

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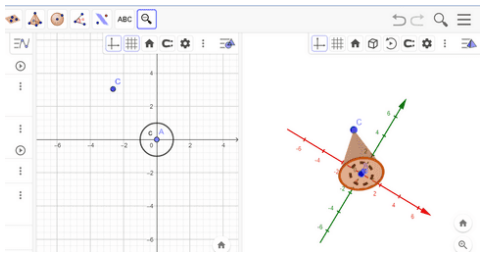

Figure 4. Cone using Geogebra

Through Figures 3 and 4, the properties of a cone can be understood as follows : (1) having 2 curved sides, namely the base side in the form of a circle and the blanket side in the form of an isosceles triangle, (2) having 1 vertex (peak point), (3) having a line the painter, namely the lines on the conical blanket that are drawn from the apex (point of the corner) to the points on the circumference of the circle, and (4) have the volume and surface area of the cone.

In Figure 3, for example, the diameter of the Sarune Bolon is 2 cm, the height is 10 cm, then it can be determined:

- Volume of Cone (V) = $V = \frac{1}{3}\pi(\frac{1}{2}d)^2t = \frac{1}{3}.\frac{22}{7}.(\frac{1}{2}.2)^2.10 = \frac{220}{21} = 10{,}47cm^3$
- Cone surface area = $\pi rs + \pi r^2$

Before determining the surface area of a cone, it is necessary to determine the line of the cone painter, namely
$s = \sqrt{r^2 + t^2} = \sqrt{1^2 + 10^2} = \sqrt{101}$ = 10,049 cm.
Cone surface area = L = $\frac{22}{7}.1.(10{,}049) + \frac{22}{7}.1^2 = 31{,}58 + 3{,}14 = 34{,}72cm^2$

3. Garantung

Garantung is a Toba Batak musical instrument as a melody carrier.

Figure 5. Garantung

In Garantung there are 11 rectangular wooden slats that are hung on a resonator or sound storage container. The resonator or sound storage container is in the shape of a trapezoid. Each piece of wood in Garantung has a length of ± 28 cm. The Garantung beater has a diameter of ± 0.7 cm and a length of ± 22 cm (Pasaribu, 2013) [10]. Meanwhile, the size of the resonator container or sound storage is adjusted to the size of the wooden slats in Garantung.

On the wooden slats it can be seen that there is a geometric concept of a flat shape, namely a rectangle. By using Geogebra it can be described as follows:

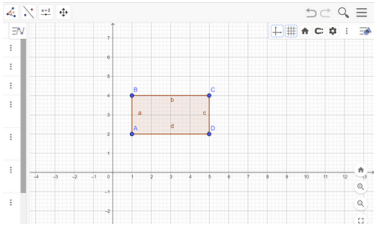

Figure 6. Rectangle with Geogebra

In the resonator container or sound storage, it can be seen that there is a geometric concept of a flat shape, this is called the trapezoid. By using Geogebra it can be described as follows:

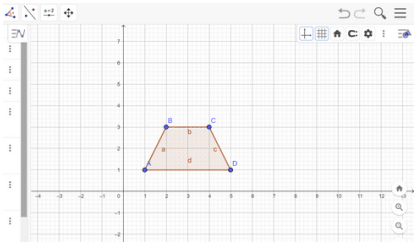

Figure 7. Trapezoid with Geogebra

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In the Garantung beater, it can be seen that there is a geometric concept of a geometric shape, that is a tube. By using Geogebra it can be described as follows:

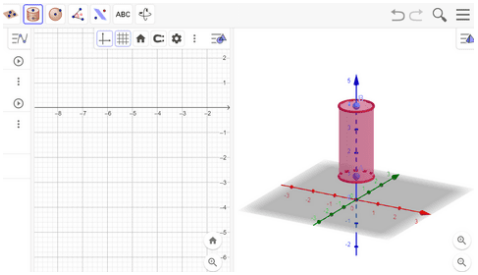

Figure 8. Tube with Geogebra

From the size of the Garantung bat, it has a diameter of ± 0.7 cm and a length of ± 22 cm. Suppose a diameter of 0.7 cm and a length of 22 cm can be determined.

Volume (V) = $\pi r^2 t = \frac{22}{7}.(0{,}35)^2.22 = \frac{22}{7} \times 0{,}1225 \times 22 = \frac{59{,}29}{7} = 8{,}47cm^3$

Tube surface area = $L = 2\pi r(r+t) = 2.\frac{22}{7}.0{,}35.(0{,}35+22) = \frac{44}{7}.(0{,}35).(22{,}35) = \frac{344{,}08}{7} = 49{,}15cm^2$

4. Taganing

Taganing is a Toba Batak musical instrument that is used in mastering the repertoire and playing melodies together with sarune. The drums in Taganing have different sizes and produce different sounds. The size of each drum in Taganing consists of (1) Taganing 1 with a diameter of 29 cm, height 81 cm, (2) Taganing 2 with a diameter of 24 cm, height 70 cm, (3) Taganing 3 with a diameter of 22 cm, height 55 cm, (4) Taganing 4 with a diameter of 19 cm, height 53 cm, (5) Taganing 5 with a diameter of 19 cm, height 53 cm, and Taganing 6 with a diameter of 16 cm, height 51 cm (Hadisukirno, 2013) [11].

Figure 9. Taganing

In Taganing, it can be seen that there is a geometric concept of a geometric shape, this is called a cylinder. By using Geogebra it can be described as follows:

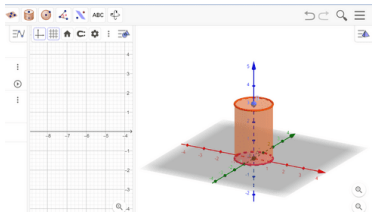

Figure 10. Tube with Geogebra

5. Gondang

The gondang (gordang) is a Toba Batak musical instrument consisting of a drum that is larger than the Taganing which acts as a carrier of both constant and variable rhythms (Juliano, 2022) [12].

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Figure 11. Gondang

In Gondang it can be seen that there is a geometric concept of a geometric shape, that is a tube. By using Geogebra it can be described as follows:

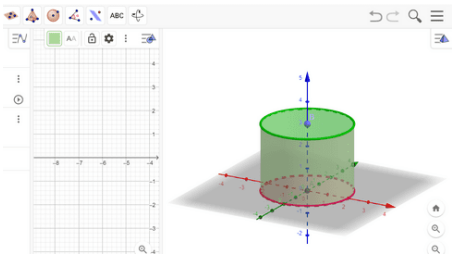

Figure 12. Tube with Geogebra

6. Sulim

Sulim is a Toba Batak traditional musical instrument consisting of a blow hole and 6 tone holes. Sulim is almost the same as the type of flute in other ethnic groups in general. The difference is only in the additional hole, namely between the blow hole and the tone hole. This additional hole has a sound color which is its own characteristic compared to other flute instruments (Matthewigt, 2018) [13].

Figure 13. Sulim

In Sulim, it can be seen that there is a geometric concept of a geometric shape that is called a tube. By using Geogebra it can be described as follows:

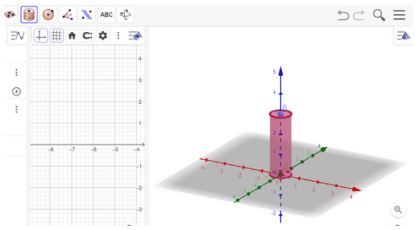

Figure 14. Tube with Geogebra

Previously, it was explained that in the Garantung, Taganing, Gondang and Sulim beaters there is a geometric concept, that is the cylinder. This can be observed directly from the shape and size of each of these Batak musical instruments and is also supported by visualization images from Geogebra so that students can understand the characteristics of the tube.

4. CONCLUSION

The result of ethnomathematics exploration of the Gondang Batak musical instrument is that there are geometric concepts in the form of flat shapes and geometric shapes. The flat shapes in question are circles, triangles, rectangles, and trapezoids. The shape of the space in question is a cone and a tube. The concept of flat shapes and spatial shapes on the Gondang Batak musical instrument can be used to introduce mathematics through local culture so that learning is more meaningful. In addition, the Gondang Batak musical instrument, which is loaded with geometric concepts, can be used as a concrete and innovative learning medium.

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2023 Vol. 4, No. 1, pp. 14-17
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ANALYSIS OF SCIENCE LABORATORY STANDARDIZATION IN PRACTICE ACTIVITIES AT UNIVERSITAS ISLAM NEGERI FATMAWATI SUKARNO BENGKULU

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ABSTRACT

This research is intended to assess the extent of laboratory standardization, the implementation of these practices, and the contribution of laboratory equipment and infrastructure to facilitating practicum activities at UINFAS BENGKULU. In this study, two different types of data collection methods were used: primary data, which was obtained directly from research participants through the distribution of questionnaires, and secondary data which involved interviews which were used to gather information through analysis. This study shows that the facilities and infrastructure of the UINFAS BENGKULU science laboratory have not met the standard of 100% of its carrying capacity.

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1. INTRODUCTION

Science education should place a strong emphasis on students' hands-on experience as well as theory, real-world concepts, facts, and principles. If science teaching is linked to environmental issues, it will be more attractive to students, When studying science, students frequently run into learning obstacles, especially when they are working with complex topics that call for a deeper comprehension. Direct experience should be emphasized in teaching science to help students become proficient in investigating and understanding nature scientifically (Ismiyanti et al., 2021). Students can benefit from doing this by understanding the natural world more deeply.

Practicum activities are a good place to carry out activities to provide direct experience to students. Practicum is an important component in the science learning process because it encourages students to be active, inventive, and curious (Harahap et al., 2022). Practicum laboratory activities are one of the things that greatly determine the effectiveness of the science teaching and learning process. Students will be able to study science through direct observation of the signs and processes of science through practicum. They will also be able to develop their scientific attitude, develop their scientific thinking skills, and be able to identify and solve new problems using scientific methods (Nasution & Hasairin, 2016).

The laboratory is a place to practice or study using special infrastructure and tools and is equipped with adequate and complete laboratory infrastructure(Silvia & Aryanti, 2022). Because it has a significant impact on students' ability to understand what is presented vocally in class, the science laboratory is a very important tool in the teaching and learning process (Anggereni et al, 2021). When students are able to carry out independent practical investigations that may be related to their unique learning, science laboratories are used more successfully (Anggereni et al., 2021). A proper laboratory needs to include standard and special facilities that can facilitate the use of the laboratory (Harling & Martono, 2021). According to (Rodrigo Garcia Motta, Angélica Link, Viviane Aparecida Bussolaro et al, 2021), a scientific laboratory room is a place for practical learning that requires facilities.

A laboratory needs to be supported by facilities and infrastructure that are in accordance with the needs and standards for the type of laboratory (Hayati & Sumarsih, 2020). The components of scientific laboratory facilities in high schools listed in the Minister of National Education of the Republic of Indonesia Number 24 of 2007 are laboratory buildings/rooms, furniture, educational equipment, experimental tools and materials, educational media, consumables, and other equipment.

According to PERMENDIKNAS no. 24 of 2007 which regulates the standardization of scientific laboratories, the minimum size of a science laboratory can accommodate one group (one class) with around 20 students. The minimum science lab has areas for practice, storage, and preparation. Facilities that must be available include clean water and a room with sufficient lighting to read and observe experimental objects (Rahman & Sumenep, 2017). Furniture, educational tools, educational tools, and other equipment such as electrical installations, first aid kits, fire extinguishers, trash cans, and wall clocks are some of the facilities regulated in Permendiknas 24/2007.

This study examines how the state of the science laboratory infrastructure supports an efficient and minimum standard science learning process. The purpose of this study was to determine the conditions of the science laboratory in accordance with the standardization of Permendiknas No. 24 of 2007 and find out about student satisfaction with science laboratory facilities and infrastructure. In addition, the government and universities must strive to build and complete laboratory facilities and infrastructure.

2. METHODOLOGY

The collection of data and information needed in this study was carried out at UINFAS BENGKULU. The research was conducted on November 28, 2022. There were two types of data collection methods used in this research, such as primary data obtained directly from research subjects through the distribution of questionnaires that have been given and secondary data in the form of information collected through analysis in the form of interviews. Primary data collection was carried out using a questionnaire instrument. What is meant by a questionnaire instrument in the form of questions, answers are provided by using certain categories or choices that are appropriate to the topic of the instrument of the research subject.

The data that has been collected is arranged in the form of scores on an interval scale. Questionnaires were used to obtain results from the level of student satisfaction with laboratory facilities and infrastructure, interviews are used to determine laboratory standardization.

3. RESULT AND DISCUSSION

Observation results are adjusted or equated with the standards set by the government, in law No. 24 of 2007 concerning minimum standards that must be owned by a science laboratory. the results of the interviews will be presented or described

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in accordance with the results of the interviews that have been conducted and the results of the questionnaires that have been distributed to 20 respondents.

1. Science laboratory standardization against Permendiknas standards.

From the results of the interviews that were conducted regarding the science laboratory facilities and infrastructure, there was an index that became the center of the question which is the condition of the science laboratory infrastructure was adequate but not yet included in the standard category.

Table 1. Results of Interviews and Observations on Laboratory Room Facilities I

Type	Standard ratio	Real ratio	Ket
Lab room	The science laboratory room can be filled with at least one study group, the ratio of drinking lab space is 2.4m2/student	The science laboratory room can be filled with a study group with a capacity of ± 20 students.	Adequate
Prep room	The science laboratory room is at least equipped with a preparation room that has good electrical installations and air ventilation	The science laboratory room is not equipped with a preparation room, which has poor electrical installations and air ventilation	Inadequate
Warehouse	The science laboratory room is at least equipped with a storage room that has electrical installations, good air ventilation and mobile facilities such as tool cabinets, material cupboards.	The science laboratory does not have a special room or warehouse for storage, but has tool cabinets and material cabinets that are still in good condition and can be locked.	Inadequate
Lighting	The science laboratory room is equipped with sufficient and adequate lighting such as cable networks, fuses, lights, switches and sockets,	The lighting for the laboratory room is good, there is 1 socket in the laboratory room.	Adequate
Clean water is available	There is a sink with clean running water	Do not have a place for washing hands or a sink, usually students will bring their own water and tissues to wash their hands and clean equipment.	Inadequate

In the science laboratory there is a main room, which is the practicum room, storage room, and preparation room. The preparation room is used to prepare practicums, test equipment, or conduct research(Cahyani, 2022).From the results of the interview, it can be explained that the UINFAS Bengkulu Science laboratory building cannot be said to be standard because this Science laboratory room is a classroom that is made into a laboratory so that it is still integrated with the SAINTEK building which is still attached to the classroom. the size of the science laboratory is also inadequate because there is no preparation room available, no storage warehouse and no hand washing area or sink. In the science laboratory room also still use a fan.

The practicum facilities and materials at the UINFAS Bengkulu Science laboratory were not sufficient, especially the physics practicum facilities and materials, only tools and materials for biology and chemistry practicum were available. The practicum tool and materials room is equipped with several tool cabinets and practicum materials, but the UINFAS Bengkulu Science laboratory still lacks tool and material cabinets. Storage of practicum tools and materials in a cupboard is also based on the types and materials placed in different cupboards. Practicum materials must be stored by class not by alphabet on different shelves or cupboards to avoid accidents such as explosive materials, burning materials and so on.(Rivo Alfarizi Kurniawan, 2021). The UINFAS Bengkulu science laboratory practicum room is equipped with a practicum table, blackboard, and pictures/charts. Besides that, the practicum room is also equipped with adequate light in the form of lights and windows as well as work safety standards in the form of a fire extinguisher placed in the room.

2. The results of the questionnaire on the level of student satisfaction with laboratory facilities and infrastructure

Information :
A: unsatisfactory
B : unsatisfactory
C : quite satisfactory
D : satisfactory
E : very satisfying

Table 2. Questionnaire on the level of student satisfaction with facilities and infrastructure

No	Question	A	B	C	D	E
1	Equipment availability	-	4	9	6	1
2	Availability of materials	-	10	8	2	-
3	The ability of lecturers to provide explanations	1	3	7	9	-
4	Obedience to the rules	-	5	11	4	1

2023 Vol. 4, No. 1, pp. 14–17
ISSN(e): 2715-985x
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5	Arrangement and arrangement of equipment and practicum materials	1	3	12	5	-
6	Facilities and infrastructure	1	3	10	6	-
7	Cleanliness	-	1	5	14	-
8	Security	-	1	3	16	-

Based on the results of the questionnaire data analysis from student answers, the data shows that the condition of the infrastructure is unsatisfactory. In fact, the conditions that appear are the preparation room and storage room together with the practicum room. Even the science laboratory does not have tools and materials for physics practicum, only available tools and materials for chemistry and biology practicum, some tools and practicum materials in the UINFAS BENGKULU science laboratory do not exist and students must prepare practicum materials that are not available in the laboratory. There is no place to wash hands/sinks in the science laboratory room, so every student doing practical work must bring their own water and tissues.

4. CONCLUSION

From the results of research related to standardization of science laboratories in practicum activities at UINFAS Bengkulu, it can be concluded that the standard of facilities and infrastructure at the UINFAS Bengkulu science laboratory does not meet the standards of facilities and infrastructure specified in Permendiknas No. 24 of 2007, because there are still many deficiencies in facilities and infrastructure, such as the laboratory room uniting with the classroom in the laboratory room there is no preparation room available, there is no storage warehouse, there is no place to wash hands/sink and the laboratory room still uses a fan. In the UINFAS Bengkulu Science laboratory room, there are only 5 cabinets so that the Science laboratory still lacks cupboards for storing tools and materials, but practicum tools and materials have been arranged according to type and class.

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TEACHER PERFORMANCE IMPROVEMENT OPTIMIZATION THROUGH TEAMWORK STRENGTHENING, INTERPERSONAL COMMUNICATION, ADVERSITY QUOTIENT AND WORK MOTIVATION

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ABSTRACT

In educational institutions, teachers are a core part of the management element. Teacher Performance Assessment is an assessment of each item of the teacher's main task activities in the context of career development, rank, and position. This assessment is carried out through observation and monitoring. Observation is a process of collecting teacher performance data which is carried out through direct observation of how the teacher works when delivering learning material or guidance in class to students. Observations consist of before observations, during observations and after observations.

The implementation of the main task of a teacher cannot be separated from the ability of a teacher in mastering knowledge, skills, and attitudes in carrying out their duties as professional educators. This is a manifestation of the required competencies as regulated in Permendiknas Number 16 of 2007 concerning Academic Qualification Standards and Teacher Competencies. In order to improve teacher performance, research is needed to obtain good information about other variables that can be used to improve teacher performance.

The purpose of this study is to make efforts to improve teacher performance by conducting research on the influence between teamwork, interpersonal communication, adversity quotient and work motivation. This study uses the path analysis method (path analysis) to determine the effect between the variables studied and the SITOREM method for indicator analysis in order to obtain optimal solutions in an effort to improve teacher performance. The population of this study were 289 teachers of SMK PGRI in Bogor Regency. From the population, samples were taken using the Slovin formula and a sample of 168 people was obtained.

The results of the analysis using the path analysis method show that there is a positive influence between teamwork and teacher performance with a large effect of $\beta z1 = 0.418$ so that strengthening teamwork can improve teacher performance. There is a positive influence between interpersonal communication and teacher performance with a large effect of $\beta z2 = 0.398$ so that the strengthening of interpersonal communication can improve teacher performance. There is a positive influence between adversity quotient and teacher performance with a large effect of $\beta z3 = 0.445$ so that strengthening adversity quotient can improve teacher performance. There is a positive influence between work motivation and teacher performance with a large effect of $\beta z4 = 0.419$ so that strengthening work motivation can improve teacher performance.

From the SITOREM analysis, the optimal solution is obtained, namely from the 27 indicators studied there are 14 indicators that are in good condition so that these indicators only need to be maintained or developed, and there are 13 indicators that are still weak and need to be improved. Improvements to indicators that are still weak are complemented by a priority order for their handling. Good indicators are: 1) Ownership, 2) Resilience, 3) Achievement, 4) Job attachment, 5) Good supervision, 6) Adequate rewards, 7) Trust, 8) Harmony, 9) Completeness, 10) Empathy , 11) Openness, 12) Positivity, 13) Work Productivity and 14) Quantity of Work Results Indicators that need to be improved in order of priority for handling are as follows: 1st Control, 2nd Authenticity, 3rd Desire to get appreciation and recognition, 4th Job Guarantee, 5th Desire for power, 6th Accountability, 7th Group Goal Orientation, 8th Coordination, 9th Support, 10th Equality, 11th Quality of Work, 12th Work Effectiveness, 13th Work Efficiency.

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1. INTRODUCTION

Human resources in educational organisations play a very important role. This is based on the belief that individuals are the formulators of organisational goals and at the same time the main drivers to achieve goals. Each individual in the organisation has an obligation to complete the main tasks in accordance with their responsibilities. As members of the organisation, individuals have an obligation to work together in realising organisational goals.

Teacher Performance Appraisal is an assessment of each item of the teacher's main task activities in the context of career development, rank, and position. This assessment is conducted through observation and monitoring. Observation is a process of collecting teacher performance data through direct observation of how teachers work when delivering learning materials or mentoring in the classroom to students. Observation consists of before observation, during observation and after observation.

The implementation of the teacher's main task cannot be separated from the ability of a teacher to master the knowledge, skills and attitudes in carrying out his duties as a professional educator. This is a manifestation of the required competencies as stipulated in Permendiknas No. 16/2007 concerning Standards for Academic Qualifications and Teacher Competencies. In order to improve teacher performance, research is needed to obtain good information about other variables that can be used to improve teacher performance.

Based on a preliminary survey conducted through distributing questionnaires to 30 teachers at 7 SMK PGRI in Bogor Regency, it was found that there were 41.7% teachers who were not optimal in achieving the quality of work results. There were 36.7% teachers who were not optimal in work effectiveness, 35% teachers were not optimal in work efficiency, 40% teachers were not optimal in work productivity, and 35% teachers were not optimal in quantity of work results.

The survey results above show that teacher performance still needs to be improved and given that teacher performance is an important element related to achieving educational goals. Therefore, teacher performance is interesting to study.

The purpose of the study is to produce optimal solutions in improving teacher performance by finding the right strategies and ways to improve teacher performance, which is by strengthening the independent variables that have a positive effect on teacher performance. These variables are teamwork, interpersonal communication, adversity quotient and work motivation. The optimal solution found is then used as a recommendation to related parties, including teachers, principals, school supervisors, school organising agencies and education offices.

Literature Review

A. Teacher Performance

Mathis, Robert L, et all (2011) [1], performance is a description of the level of achievement of the implementation of an activity/program/policy in realising the goals, objectives, mission and vision of the organisation as stated in the strategic planning of an organisation. The performance indicators are as follows: 1) Work quantity, meaning the volume of work produced under normal conditions, 2) Quality of work, which can be in the form of tidiness accuracy and relevance of results by not ignoring the volume of work, 3) Utilisation of time, which is the use of working time adjusted to the policies of the organisation or government agency, and 4) Cooperation, which is the ability to handle relationships with other people at work.

Gary Dessler (2012) [2], performance is the actual achievement of employees compared to the expected performance of employees. Expected work achievement is the achievement of standards that are prepared as a reference on how to see the performance of employees in accordance with their position compared to the standards made. By indicators: 1) Quality. Work quality is measured by employee perceptions of the quality of work produced and the perfection of tasks on employee skills and abilities. 2) Quantity. It is the amount produced expressed in terms such as the number of units, the number of activity cycles completed. 3) Timeliness. It is the degree to which activities are completed at the beginning of the stated time, seen from the angle of coordination with output results and maximising the time available for other activities. 4) Effectiveness. It is the degree to which the use of organisational resources (manpower, money, technology, raw materials) is maximised with a view to increasing the output of each unit of resource use. 5) Independence represents the degree to which an employee will be able to perform his/her job functions Work commitment. It is the degree to which an employee has a work commitment with the agency and responsibility.

Stephen P. Robbins and Mary Coulter (2012) [3], performance is the end result of an activity, with the criteria of whether these results can be considered efficient and effective with the criteria for measuring performance, including work productivity, work effectiveness, and efficiency shown by workers.

Jason A. Colquitt, et. all (2016) [4], performance is a number of behaviours and contributions of organisational members to the achievement of organisational goals. Performance is reflected in the work results shown by employees. Performance has 3 dimensions, including: task performance, citizenshipbehaviour and counter-productive behaviour.

Based on the theoretical study above, it can be synthesised that Teacher Performance is a person's achievement which is the result of work in carrying out the tasks assigned to him in accordance with organisational goals, which can be measured based on the following indicators: 1) Work Productivity, 2) Work Effectiveness, 3) Work Efficiency, 4) Quality of Work Results, and 5) Quantity of Work Results.

B. Teamwork

2023 Vol. 4, No. 1, pp. 18-26
ISSN(e): 2715-985x
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Stephen P. Robbins and Timothy A. Judge (2013) [5], teamwork or work team is a group whose members produce group performance that is greater than the sum of individual performances with the following indicators: performance as a collective, between group members synergise with each other, prioritising togetherness (not individuals), and between members complement each other's skills and expertise.

J.L. Gibson, et.al (2016) [6], group work is a group of individuals whose behaviour and performance influence each other between one member and another. With the following indicators: The members have the same goal (Group Goals), Strong interpersonal relationships between members, The group fosters togetherness, and between members complement each other (proximity).

R. Kreitner & A. Kinicki (2010) [7], group work pattern is a group of individuals who feel satisfied working in a group and each is willing to contribute to the group. Factors that influence group cooperation: group goals are clearly formulated, active participation of members, relationships between members are informal, decisions are taken together (consensus), open interpersonal communication, clear group norms, and complementary abilities.

Tenner, A.R., & DeToro, I.J., (2012) [8], Teamwork is a group of people who work together to achieve the same goals and these goals will be easier to obtain by doing teamwork than doing it alone. With the following indicators: Evaluation and rewards, Social relationships, Organisational support, Task characteristics, and Leaders.

DeJanaz, et.al (2006) [9], Teamwork is the ability of individuals to cooperate well in achieving the goals and objectives of the team and its members are able to participate in the team and get satisfaction in the team, with the characteristics of having goals, understanding roles and duties, trusting and supporting each other and being responsible for carrying out tasks to achieve common goals. With the following indicators: Having clear goals, Understanding tasks and roles in the team, Trusting and supporting each other, Being able to participate in the team, and Being responsible for the team.

Based on the descriptions above, it can be synthesised that teamwork is a group of individuals to carry out good cooperation that is interconnected with each other and is easier to obtain by doing teamwork than doing it alone, which contains elements of trust, honesty, mutual trust, support, and responsibility in carrying out tasks to achieve common goals with indicators, including: 1) Coordination, 2) Coordination, and 3) Teamwork: 1) Coordination, 2) Accountability, 3) Harmony, 4) Trust, 5) Orientation to Group Goals. and 6) Completeness.

C. Interpersonal Communication

According to Stephen W. Littlejohn & Karen A foss (2018) [10], communication (in the interpersonal sense) is the verbal exchange of thoughts or ideas. There are several aspects that need to be considered by the actors in interpersonal communication for interpersonal communication to take place effectively. Aspects of interpersonal communication are openness, empathy, support, positivity and equality.

According to John R. Schermerhorn, et. al. (2017) [11], communication is the interpersonal process of the sending and receiving of symbols with messages attached to them. There are four dimensions that have an impact on interpersonal communication: self-image, image of others, physical environment and social environment.

According to Amitkumar Singh, (2014) [12], interpersonal communication is the process by which information and general understanding is transmitted between one person and another. Dimensions of interpersonal communication are openness, which is the willingness to respond willingly to information received in dealing with interpersonal relationships; empathy, which is feeling what others feel; supportiveness, which is an open situation to support effective communication; positivity, a person must have positive feelings about himself, encourage others to participate more actively, and create a communication situation conducive to effective interaction; and equality, which is a tacit recognition that both parties value, are useful, and have something important to contribute.

According to Fred Luthans, (2016) [13], interpersonal communication is considered as a basic method to influence behaviour change. It combines psychological processes (perception, learning and motivation) on the one hand and language on the other hand. The indicator of interpersonal communication is intention. Effective feedback is designed to improve performance and the results of work become a more valuable asset, Specificity. Effective feedback is designed to provide specific information to the recipient so that they know what to do to improve Effective feedback can also be characterised as descriptive rather than evaluative, usefulness. Effective feedback is information that employees can use to improve their performance, Timeliness. There are also considerations about the timing of feedback. In general, the earlier the feedback, the better. That way, the employee has a better chance of knowing what the manager is talking about and can take corrective action, Readiness. For feedback to be effective, employees must be ready to receive it. If feedback is imposed or forced on the employee, it is much less effective, Clarity. Effective feedback needs to be clearly understood by the recipient. A good way of checking this is to ask the recipient to repeat the main points of the discussion and validity. For feedback to be effective, it must be reliable and valid. Of course, if the information is wrong, the employee will feel that the manager is unnecessarily biased, or the employee may take corrective action that is inappropriate and only addresses a minor problem.

Based on the description of the concept above, it can be synthesised that interpersonal communication is an activity of sending and receiving messages reciprocally carried out by individuals who have a close relationship in order to achieve the desired goals in the organisation with indicators: 1). Openness (Opennes), 2) Equality (Equility), 3) Empathy (Emphaty), 4) Possitiveness and 5) Supportiveness.

D. Adversity Quotient

2023 Vol. 4, No. 1, pp. 18-26
ISSN(e): 2715-985x
DOI: http://dx.doi.org/10.30596%2Fijems.v4i1.13305

Adversity intelligence is the ability to turn obstacles into opportunities for success in order to achieve goals, according to Paul G. Stoltz (2005) [14]. The dimensions of adversity intelligence are called CO2RE, namely Control, how much control is felt over the difficulties or failures experienced. Origin and Ownership, related to the view of the origin of the adversity and the recognition of the consequences of the adversity experienced. Scope, related to the extent to which adversity is perceived to span life. Endurance, a view of how long the adversity and its causes will last.

Adversity Quotient, related to how well individuals are able to solve and combat the problems they face, according to Rachapoom Pangma, at.al (2009) [15]. The indicators of the adversity quotient are as follows Identification of problems and how to respond or not to respond to the problem, search and development of ego identity or self-control in problem situations, adaptation and adjustment to the environment, individual strength to face problems (physical and mental) and adjustment to stressful situations.

According to Dr Andy Green (2006) [16], adversity intelligence is the desire to succeed in achieving a goal, the resilience to bounce back and the nature of not giving up easily in achieving goals. The indicators of adversity intelligence are as follows: Desire to succeed, Self-resilience, Not giving up easily and Ability to bounce back.

Maxwell, J. C. (2004) [17], adversity intelligence is the ability to turn failure into a springboard. The indicators of adversity intelligence are as follows: Never giving up, Viewing failure as temporary, Viewing failure as an event in itself, Having realistic expectations, Focusing on strengths, Using multiple approaches, and Recovering easily.

Based on various previous explanations, it can be summarised that the Adversity Quotient is an individual characteristic that is a response to various difficulties and obstacles in the performance of tasks. The indicators of adversity quotient are as follows: 1) control, 2) origin, ownership, reach and persistence.

E. Work Motivation

Jennifer M. George and R. Jones, (2012) [18], Work motivation is a psychological force that determines the direction of one's behaviour in an organisation, the level of one's effort and the level of one's persistence. The elements of work motivation are as follows 1) Direction of behaviour, which is what behaviour a person chooses to perform in an organisation, 2) Level of effort, which is how hard a person works to perform the chosen behaviour, and 3) Level of persistence, which is how hard a person continues to try to perform the chosen behaviour successfully in the face of obstacles, barriers.

Pinder, C. C. (2008) [19], Work motivation is a set of energetic forces that come from both inside and outside the individual to initiate work-related behaviour and to determine the form of direction, intensity and duration. Motivation is generally based on three aspects, that is Direction, which is the goal to be achieved; Intensity, which is the level and strength; and Duration/persistence, which is the time requirement. John R. Schermerhorn, Jr. at.al (2007) [20], Motivation refers to the forces within a person that account for the level, direction and persistence of effort made at work. Herzberg's two-factor theory identifies context as a source of satisfaction and dissatisfaction: Motivating factors, as internal factors that are a source of job satisfaction and promote motivation, Hygiene factors, as external factors in the work context, are a source of job dissatisfaction. Greenberg J & Baron Robert. A, (2008) [21], Motivation is a process that encourages, directs, and sustains human behaviour towards the achievement of a goal. Motivation will cause stimulation, encouragement within to do something as much as possible, and be properly directed in achieving goals. Motivation factors are: Stimulation, which is something that can influence someone to do activities; Maintenance, which is an activity in maintaining and taking good care of something; The arousal element, which is to arouse something in oneself in doing activities/work; and Direction, which is to provide a definite direction in achieving the desired goal.

Based on the various previous explanations, it can be summarised that work motivation is the degree of encouragement, desire and impulse that grows in a person, both from within and from outside himself, to do a job with high enthusiasm, using all the abilities and skills he has, aiming at maximum achievement. Indicators of work motivation are 1) job relatedness, 2) power needs, 3) esteem and recognition, 4) adequate rewards, 5) job security, and 6) good supervision.

2. METHODOLOGY

As explained above, this research aims to develop strategies and ways to improve teacher performance by exploring the strength of influence between teacher performance as the dependent variable and teamwork, interpersonal communication, adversity quotient and work motivation as the independent variables. The research method used was a survey method with a path analysis approach for the testing of statistical hypotheses and the SITOREM method for the analysis of indicators for the determination of the optimal solution for the improvement of teacher performance.

The research constellation of the variables studied and their indicators is as follows

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2023 Vol. 4, No. 1, pp. 18-26
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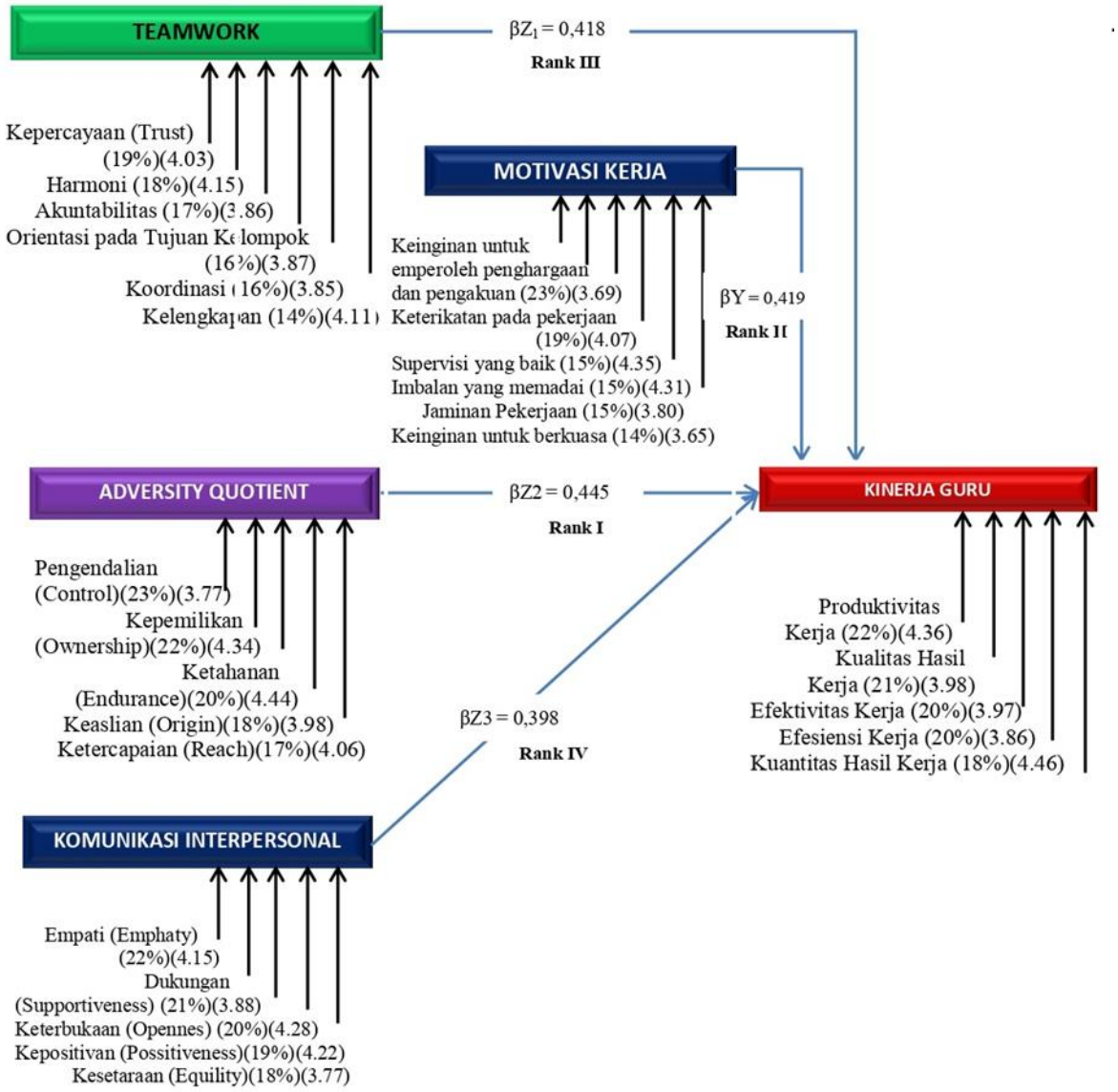

Figure 1. The Constellation of Relationships between Variables and Researched Indicators

The research was conducted on teachers in SMK PGRI in Bogor Regency. The population was 289 teachers, and the sample size was 168 teachers, calculated using the Slovin formula from Umar [22].

Data collection in this study used research instruments in the form of questionnaires distributed to teachers as research respondents. The research instrument items were derived from the research indicators being studied. The research instrument was first tested for validity and reliability [23] before being distributed to the respondents. The validity test was carried out using the Pearson Product Moment technique, while the reliability test was carried out using the Cronbach Alpha formula.

Homogeneity test, normality test, linearity test, simple correlation analysis, coefficient of determination analysis, partial correlation analysis and statistical hypothesis testing were carried out after data collection.

In addition, an indicator analysis was carried out using Hardhienata's SITOREM method [24] to determine the priority order for the improvement of indicators as a recommendation to related parties. This is the result of this study. SITOREM uses three criteria to determine the order of priority for dealing with indicators: (1) the strength of the relationship between variables obtained from hypothesis testing, (2) the order of priority for dealing with indicators obtained from expert judgement, and (3) the value of the indicators obtained from the calculation of the data used from the responses of the research participants.

3. RESULT AND DISCUSSION

A. The Effect of Teamwork towards the Teacher Performance

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The results of data processing through statistical hypothesis testing show that there is a positive influence between teamwork and teacher performance, with a large effect of βz1 = 0.418. This means that the higher the teamwork, the higher the teacher performance. This means that teamwork needs to be strengthened if teacher performance is to be improved.

The empirical evaluation in relation to the priority of the indicators of teamwork variables, taking into account the factors of cost, benefit, urgency and immediacy, resulted in indicators that are in good condition to be maintained or developed, such as 1) confidence (19%) (4.03), 2) harmony (18%) (4.15), and 3) integrity (14%) (4.11).The priority order of the indicators requiring improvement are: 1) accountability (17%) (3.86), 2) orientation towards group objectives (16%)(3.87) and 3) coordination (16%) (3.85).

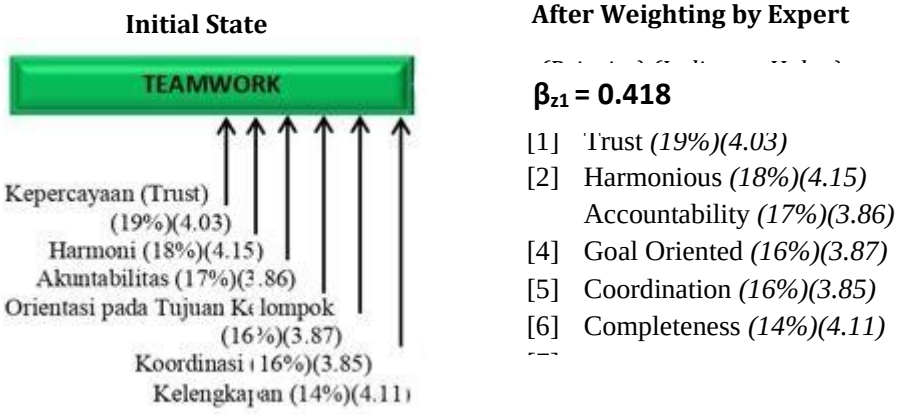

Figure 2. Indicator Weighting Results and Teamwork Indicator Values

B. The Effect of Communication Interpersonal towards the Teacher Performance

The results of data processing through statistical hypothesis testing show that there is a positive influence between interpersonal communication and teacher performance, with a large effect of βz2 = 0.398. This means that the higher the interpersonal communication, the higher the teacher performance. The implication is that if teacher performance is to be improved, interpersonal communication needs to be strengthened.

An empirical evaluation of the priority given to the indicators of interpersonal communication variables, taking into account the factors of cost, benefit, urgency and immediacy, shows that the indicators that are in a good state, so that they need to be maintained or developed, which are 1) Empathy (22%) (4.15), 2) Openness (20%) (4.28), and 3) Possitiveness (19%) (4.22) and the priority order of indicators that need to be improved are: Supportiveness (21%)(3.88) and Equality (18%) (3.77).

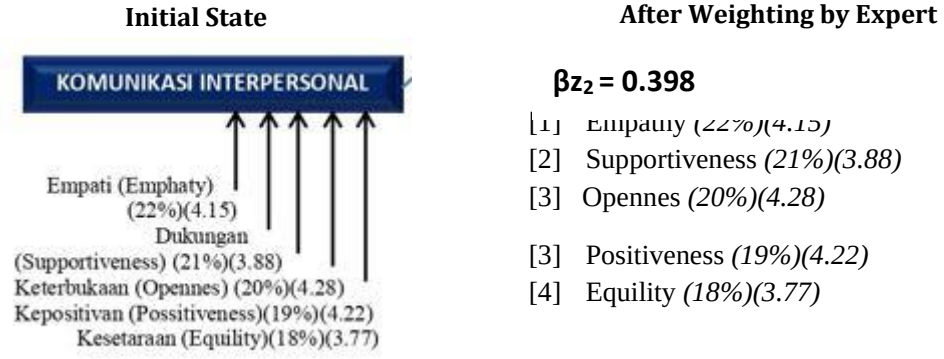

Figure 3. Indicator Weighting Results and Interpersonal Communication Indicator Values

C. The Effect of Adversity Quotient towards the Teacher Performance

The results of data processing through statistical hypothesis testing show that there is a positive influence between interpersonal communication and teacher performance, with a large effect of βz3 = 0.445. This means that the higher the interpersonal communication, the higher the teacher performance. The implication is that in order to improve teacher performance, it is necessary to strengthen interpersonal communication.

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The empirical evaluation in relation to the priority of the indicators of interpersonal communication variables, taking into account the factors of cost, benefit, urgency and urgency, results in indicators that are in good condition so that they are maintained or developed, which are 1) Ownership (22%) (4.34), 2) Endurance (20%) (4.44), and 3) Reach (17%) (4.06), and the priority order of indicators that need to be improved is: 1) Control (23%) (3.77) and 2) Origin (18%) (3.98).

Figure 4. Indicator Weighting Results and Indicators of Organisational Equity

D. The Effect of Work Motivation towards the Teacher Performance

The results of data processing through statistical hypothesis testing show that there is a positive influence between work motivation and teacher performance, with a large effect of βz4 = 0.419. This means that the higher the work motivation, the higher the teacher performance. The implication is that if teacher performance is to be improved, it is necessary to strengthen work motivation.

The empirical evaluation in relation to the priority of the indicators of the work motivation variable, taking into account the factors of cost, benefit, urgency and urgency, results in indicators that are in good condition to be maintained or developed, which are 1) Attachment to work (19%)(4.07), 2) Good supervision (15%)(4.35), and 3) Adequate rewards (15%)(4.31).The priority order of the indicators to be improved are: 1. the desire for rewards and recognition (23%) (3.69), 2. job security (15%) (3.80) and 3. the desire for authority (14%) (3.65).

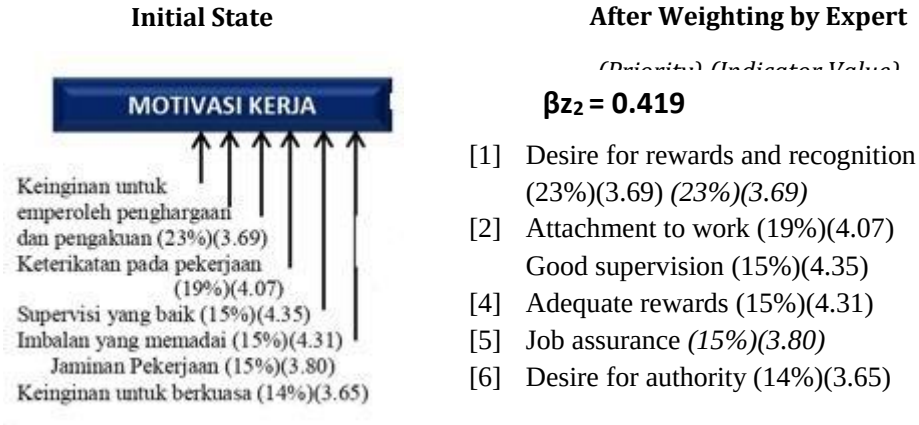

Figure 5. Indicator Weighting Results and Indicators of Work Motivation

E. Optimal Solution for Improving Teacher Performance

Based on the results of the statistical hypothesis testing, indicator prioritisation and indicator value calculations described above, a recapitulation of the research findings can be made. The optimal solution for strengthening teacher performance is shown in Table 1.

Table 1. SITOREM Analysis Results

IJEMS: Indonesian Journal of Education and Mathematical Science
2023 Vol. 4, No. 1, pp. 18-26
ISSN(e): 2715-985x
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Optimal Solution in Improving Teacher Performance

Priority order of indicator to be Strengthened		Indicator remain to be maintained	
1st	Control (23%)(3.77)	1	Ownership (22%)(4.34)
2nd	Originality (18%)(3.98)	2	Endurance (20%)(4.44)
3rd	Keinginan untuk memperoleh penghargaan dan pengakuan (23%)(3.69)	3	Reach (17%)(4.06)
4th	Job assurance (15%)(3.80)	4	Attachment to work (19%)(4.07)
5th	The desire for authority (14%)(3.65)	5	Good supervision (15%)(4.35)
6th	Accountability (17%)(3.86)	6	Adequate rewards (15%)(4.31)
7th	Orientation towards group objectives (16%)(3.87)	7	Trust (19%)(4.03)
8th	Coordination (16%)(3.85)	8	Harmony (18%)(4.15)
9th	Supportiveness (21%)(3.88)	9	Completeness (14%)(4.11)
10th	Equility (18%)(3.77)	10	Emphaty (22%)(4.15)
11th	Quality of Work Result (21%)(3.98)	11	Opennes (20%)(4.28)
12th	Work Effectivity (20%)(3.97)	12	Possitiveness (19%)(4.22)
13th	Work Efficiency (20%)(3.86)	13	Work Productivity (22%)(4.36)
		14	Work Result Quantity (18%)(4.46)

4. CONCLUSION

The following conclusions can be drawn from the discussion that has been described above:

1. There is a positive influence between teamwork and teacher performance with a large influence of 0.418. Therefore, strengthening teamwork can improve teacher performance.
2. Strengthening interpersonal communication can improve teacher performance. There is a positive influence between interpersonal communication and teacher performance with a magnitude of 0.318.
3. There is a positive influence between adversity quotient on teacher performance with a magnitude of 0.445 so that strengthening adversity quotient can improve teacher performance.
4. Strengthening work motivation can improve teacher performance.There is a positive influence between work motivation and teacher performance with a magnitude of 0.419.

The above conclusions imply that if teacher performance is to be improved, it is necessary to strengthen teamwork, interpersonal communication, adversity quotient and work motivation.

The optimal solution is derived from the results of the SITOREM analysis as follows:

1. The priority order of the indicators of teamwork, interpersonal communication, adversity quotient and work motivation is as follows 1. control (23%) (3.77), 2. origin (18%) (3.98), 3. desire for reward and recognition (23%) (3.69), 4. job security (15%) (3.80), 5. desire for power (14%) (3.65), 6. accountability (17%) (3.86), 7. group goal orientation (16%) (3. 87), 8. coordination (16%)(3.85), 9. support (21%)(3.88), 10. equity (18%)(3.77), 11. quality of work (21%)(3.98), 12. effectiveness of work (20%)(3.97), 13. efficiency of work (20%)(3.86).
2. Indicators that are already in a good state of maintenance or development are 1) Ownership (22%)(4.34), 2) Endurance (20%)(4.44), 3) Reach (17%)(4.06), 4) Attachment to work (19%)(4.07), 5) Good supervision (15%)(4.35), 6) Adequate rewards (15%)(4.31), 7) Trust (19%)(4. 03), 8) Harmony (18%)(4.15), 9) Completeness (14%)(4.11), 10) Empathy (22%)(4.15), 11) Openness (20%)(4.28), 12) Possessiveness (19%)(4.22), 13) Work productivity (22%)(4.36) and 14) Quantity of work (18%)(4.46).

Suggested or recommended actions that can be taken by related parties are as follows:

1. Teachers need to improve performance by increasing control, originality, desire for rewards and recognition, job security, desire for power, accountability, orientation to group goals, coordination, supportiveness, equality, quality of work, work effectiveness, and work efficiency by strengthening teamwork, interpersonal communication, adversity quotient, and work motivation.

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2. In accordance with the results of this study, principals, school supervisors, school managers and education offices need to support teachers in improving their performance by providing appropriate guidance to strengthen teamwork, interpersonal communication, adversity quotient and work motivation.

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CONTRIBUTION OF PREREQUISITE MATERIALS AND CREATIVE THINKING TO THE ABILITY OF SOLVING LOGARITHM PROBLEMS AT SMK NEGERI 4 MEDAN

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ABSTRACT

The problem in this study is how the mastery of students in exponentiation and root to the ability of students in solving problems of logarithms whether there is a contribution of exponentiation and root on students' ability to solve logarithmic problems.

The purpose of this study is to determine the mastery of students in exponentiation and root on students' ability to solve logarithmic problems, to find out whether there is a contribution of exponentiation and root on students' logarithmic learning outcomes and to find out how much the contribution of mastery of exponentiation and root on students' logarithmic learning outcomes.

The method of this research was descriptive. As the population of this research was the students of SMK N 4 Medan Class X which were 123 people. The sampling technique used a sample of 25% which was 30 people. The research instrument used was an objective test which consisted of 40 questions.

From the results of this study, the data obtained on the proficiency of the students in learning mathematics on the subject of exponentiation and root (variable x) resulted in an average value of 6.93 and a standard deviation of 1.32. While the results of the students' learning in solving logarithmic problems (variable y) resulted in a mean value of 6.92 and a standard deviation of 1.49. Pearson's Product Moment Correlation statistic was used to test the hypotheses. The normality and linearity tests were calculated prior to hypothesis testing. From the results of the analysis it was found that the sample was normally distributed and had a linear regression shown by the equation y = 4.83 + 0.301 x r criticism, which is by comparing the value of rcount with the value of rtable with a real level of $\alpha = 0.05$. The value r = 0.27 is obtained from the calculation. This value is greater than the table for n = 30 students of 0.03. Therefore, Ho is rejected and Ha is accepted, which means that there is an effect of students' mastery of exponentiation and root on students' ability to solve logarithmic problems in Class X SMKN 4 Medan.

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1. INTRODUCTION

National education functions to develop abilities and shape the character and civilisation of a dignified nation in order to educate the nation's life, aims to develop the potential of students to become human beings who are faithful and devoted to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens (Law Number 20 of 2003). Education that is able to support future development is education that is able to develop the potential of students, so that they must be able to apply what they learn at school to face problems faced in daily life today and in the future.

Mathematics as one of the fields of study taught at every level of education has a very important and dominant role in educating students by developing the ability to think logically, critically, deductively and is further expected to support national education goals, so that the formation system can be absorbed and can keep up with technological advances.

One of the cognitive components of students that support their success is the ability to think creatively. Creative thinking patterns are very important in learning mathematics so that it can make it easier for students to solve problems in mathematics (Palobo, 2015: 75). According to Johnson (in Waluyo and Mintohari, 2013: 02) creative thinking is a mental activity that fosters original ideas and new understandings. Creative thinking always starts from critical thinking, in order to find or produce something that did not exist before or improve something.

In general, creative thinking is indeed a mental activity where a person can build new ideas from anything in his mind or memory such as ideas, information, concepts, knowledge, and experience. Creative thinking is a process of thinking that can make a person create new ideas, and creativity is the result or product of creative thinking. According to Silver (in Ismara, et al, 2017: 02) indicators to assess students' creative thinking skills refer to fluency, flexibility and novelty. Creative thinking is one of the abilities that is needed by students to welcome an increasingly modern life in the era of globalisation in facing challenges and competition.

According to Suwarsono (1987; 23) that:

"Factors that affect learning mathematics, factors that affect learning cognitive mathematics in addition to general knowledge (intelligence) deductive reasoning ability (deductive reasoning) and, mastery ability (Natural Corionaty)".

The decline in student learning achievement is because in learning students do not fully learn and master every concept or every subject matter of a lesson so that in mastering a lesson only fragments are not systematic, especially in the field of mathematics.

Learning mathematics starts from simple concepts to proceed to more complex concepts. When going to learn the next topic, the previous topic must be mastered first, because the requirement to be able to continue learning to the next topic is to master the previous topic. Learning mathematics must be gradual and structured starting from simple things to continue to complex things.

The ability to learn mathematics is not just memorising as a mechanism that lacks understanding, but knowledge in order to expect understanding, for example, the ability to master exponentiation and square root is very important, because exponentiation and root withdrawal are the basis of logarithm problems, meaning that exponentiation and root withdrawal are prerequisites for learning, mastering and understanding logarithm lessons.

Exponentiation is a mathematical operation, written as bn, involving two numbers, the base b and the exponent or power n, and pronounced as "b (raised) to the (power of) n". Whereas logarithm is the inverse (opposite) of multiplication, which is to find the power of a base number so that the result is in accordance with what is already known (Husein Tampomas, 2006: 11). From the definition of logarithm described above, logarithm is the inverse of exponent. So that logarithm material has a relationship with exponent material..

Learning the subject of logarithms, a student must first understand exponent material. Mastery of exponent material is required before learning the subject matter of logarithms. This means that exponent material is one of the prerequisites for learning logarithms, so exponent material is given in SMK class X first semester in the discussion before logarithm material. According to Ruseffendi (2006: 152) states that: Higher level mathematical concepts cannot be better understood, before understanding the previous concept well. In mathematics, every concept is related to other concepts. Likewise, between others, for example between postulates with postulates, between theories with theories, between topics with topics and between branches of mathematics.

This is supported by the theory of connectionism discovered and developed by Edward L. Thorndike, that learning must be by association (Muhibbin Syah, 2003: 92). The connection means the connection between the lessons that have been learnt and those that will be learnt by students. The stronger the link, the stronger the influence of the concept to be taught with the previous one. According to Wina Sanjaya (2010: 117) states that: An important concept of Thorndike's connectionism learning theory is what is called transfer of training. This concept explains that what children learn now must be used for other things in the future. Therefore, the concept that is taught must be related to the concept that has been understood.

Based on the experience of the Mathematics teacher in class X of SMK Negeri 4 Medan, Mr Drs Lisanuddin, it was often found that students have difficulty in solving logarithm problems because they did not master the material of multiplication and roots. The author found a problem in learning mathematics at SMK Negeri 4 Medan that has not emphasised the relationship between one material and another. Especially on the subject matter of multiplication, roots and logarithms.

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After the explanation above, the author is interested in conducting research on the title chosen by the author is "Contribution of Conditional Materials and Creative Thinking to the Ability to Solve Logarithm Problems at SMK Negeri 4 Medan".

2. METHODOLOGY

The research was conducted in SMK Negeri 4 Medan in the academic year 2004/2005. It started from July to September 2004. The population in this study were all students of Class X SMK Negeri 4 Medan with a total of 123 students. Of the total population, the sample selected was 25%, which was 30 people. The variables in the study were divided into two, independent variables (X) and dependent variables (Y). The independent variable in this study is the students' mastery in learning mathematics on the subject of exponentiation and root extraction. While the dependent variable is the students' ability to solve logarithmic problems. The research instrument used is an objective test with a total of 40 questions divided into two materials, that is, 20 questions on the subject of exponentiation and root extraction and 20 questions on logarithms. The data analysis steps are as follows:

1. Determining the mean and standard deviation of each variable X and Y (Sudjana, 1992 : 67) :

$$X = \frac{\sum f1.x1^2}{n(n-1)} \; dan \; Y = \frac{(\sum f1x1)^2}{n(n-1)}$$

By standard deviation (Sudjana, 1992 : 95)

$$S_x = \sqrt{\frac{n\sum f1xi^2 - (\sum fixi)^2}{n(n-1)}}$$

$$S_y = \sqrt{\frac{n\sum f1xi^2 - (\sum fixi)^2}{n(n-1)}}$$

Description:
X = Mean of variable x
$\bar{Y}$ = Mean of variable y

2. Normality Test (Sudjana. 1992 : 466)

The normality test is used to see whether the samples taken from each skill come from a normally distributed population or not. The steps are as follows:

a. For these standardised numbers and using the standard normal distribution list, the probability is then calculated: $F(zi) = P(z < zi)$
b. Then the proportion of $z_1, z_2, \ldots, z_n$ that are less than or equal to z_i. If this proportion is stated by $S(z_i)$, then $S(zi) = \frac{number\ of\ z1, z2, \ldots, zn\ that\ \leq zi}{n}$
c. Calculate the difference $F(z_i) - S(z_i)$ then determine the absolute value.
d. The largest absolute value of all solutions obtained is the price L0, compare it with Lt (α, n) under the condition that the sample population is normally distributed. If L0 ≤ Lt (α, n).

3. Homogenity Test (Sudjana, 1980 : 163)

To determine the homogeneity of the data studied, the Barlet test was used because with this test, testing was directly carried out for three data sets. The steps are as follows:

a. Writing Ho : $\sigma_1^2 = \sigma_2$
b. Calculating the variance of each variable (S^2i)
c. Calculating the combined variance with the formula:

$$S = \frac{\sum(ni-1)S^2i}{\sum(ni-1)}$$

Calculating the unit cost of B (Barlet) with the formula:

$$B = (logs^2) \sum (ni-1)$$

d. With dk = k-1, k is the number of variables and ϖ = 0.05. Reject the H_0 if $X^2 \geq X^2_{(1-\varpi)(k-1)}$

4. Determining the linear regression equation (Sudjana, 1992 : 315)

Y = a + bx

The regression coefficient formula for a and b is:

$$a = \frac{(\sum Y_1)(\sum Y_i^2) - (\sum X_i Y_i)}{n\sum X_i^2 - (\sum X_i)^2}$$

$$b = \frac{n\sum X_i Y_i - (\sum X_i) - (\sum Y_i)}{n\sum X_i^2 - (\sum Xi)^2}$$

IJEMS: Indonesian Journal of Education and Mathematical Science
2023 Vol. 4, No. 1, pp. 27-35
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5. Regression Linearity Test

Sumber Varians	DK	JK	KT	F
Total	N	$\sum Y_i^2$	$\sum Y_i^2$	-
Regression (a)	1	$\frac{(\sum Y_i^2)}{n}$	$\frac{(\sum Y_i^2)}{n}$	
Regression (b/a)	1	Jk_{res} = (b/a)	S^2_{reg} = JK (b/a)	$\frac{S^{2}reg}{S^{2}res}$
Residue	n – 2	$Jk_{res} = \sum(Y_i - Y_i^2)$	$Jk_{res} = \sum(Y_i - Y_i^2)$	
Tuna match	k – 2	JK (TC)	JK (TC)	$\frac{S^{2}TC}{S^{2}e}$
Errors	n – k	JK (E)	JK (E)	

a.

$$JK(E) = \sum_x \left\{ \sum Y_i^2 - \frac{(\sum Yi)^2}{n_i} \right\}$$

b.

$JK(b/a) = b\{\sum X_i Y_i - \frac{(\sum X_i)(\sum Y_i)}{n}\}$

c. $JK_{res} = \sum Y_i^2 - \frac{(\sum Yi)^2}{n} - JK(\frac{b}{a})$

d. JK (TC) = JK_{res} –JK(E)

If α = 0.05 with dk numerators k-2 and dk denominators nik obtained $F_{table} = F_{(1-\alpha)(k-2, n-k)}$ to test the linearity $F_{count} < F_{table}$ that the hypothesis is accepted.

6. Determining Hypothesis Test

$$r_{xy} = \frac{n\sum XiYi - (\sum Xi)(\sum Yi)}{\sqrt{\{n(\sum X_i^2) - (\sum X_i)^2\}\{n(\sum Y_i^2) - (\sum Y_i)^2\}}}$$

To test the hypothesis of this study, the meaningfulness of the correlation coefficient was tested using a significant statistical test, with the formula from Sudjana (1992:380) :

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

The hypothesis being tested is:

$H_O = \rho = 0$

$Ha = \rho \neq 0$

For real level α : 5% then the null hypothesis is accepted, if $-t_{(1-1/2\ \alpha)} < t < t_{(1-1/2\ \alpha)}$ in other cases H_O is rejected, accepted the t distribution used has dk = n-2. Whereas to find how much the contribution between the two variables used is the determination test with the formula:

$D = r^2 \times 100\%$

In which

$$r^2 = \frac{b(n\sum XiYi) - (\sum Xi)(\sum Yi)}{n\sum Y_i^2 - (\sum Yi)^2}$$

Description:

r_{xy}	: correlation coefficient between variable x and variable y
n	: sample size
xy	: multiplication of x and y variables
x	: independent variable
y	: dependent variable
$(\sum x)^2$	: square of the sum of the x scores
$(\sum y)^2$	: squared sum of y scores

3. RESULT AND DISCUSSION

After distributing the research instruments to students, the following are the test results related to students' abilities on the subject of exponentiation and roots and logarithms.

Table I

Students' Mathematics Learning Achievement on the Subject of Exponentiation and Roots and Logarithms

IJEMS: Indonesian Journal of Education and Mathematical Science
2023 Vol. 4, No. 1, pp. 27-35
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No	X_1	X_2^2
1	7	49
2	9	81
3	9	81
4	5	25
5	4	16
6	8	64
7	7	49
8	7	49
9	6,5	42,5
10	6,5	42,5
11	8	64
12	4	16
13	8,5	72,5
14	9,5	90,25
15	9,5	90,25
16	4	16
17	7	49
18	5	25
19	8,5	72,5
20	6,5	36
21	6,5	36
22	7	49
23	6,5	36
24	8	64
25	7	49
26	6,5	42,25
27	5	25
28	7	49
29	7,5	56,25
30	7,5	56,25
	208	492,25

No	X_1	X_2^2
1	6,5	42,25
2	9	81
3	7	49
4	6	36
5	7	49
6	4	16
7	8	64
8	8	64
9	7	49
10	7	49
11	7,5	56,25
12	7	49
13	9	81
14	7,5	56,25
15	8,5	72,25
16	9	81
17	4	16
18	5	25
19	8,5	72,25
20	8,5	72,25
21	8	64
22	5	25
23	6,5	42,25
24	7	49
25.	6	36
26.	7	49
27.	5	25
28.	4	16
29.	7,5	56,25
30.	7,5	56,25
	207,5	1499,25

From the table above obtained:

N= 30 $\sum X_1^2$= 1492,25 $\sum Y_1^2$= 1499,25

$\sum X_1$= 208 $\sum Y_1$= 207,5

From the table above, the average student learning achievement on the subject of exponentiation and root was obtained.

$$\bar{X} = \frac{208}{30} = 6{,}93$$

with the standard deviation being

$$S^2 = \frac{N\sum X_1^2 - (\sum X0)^2}{N(N-1)}$$

$$= \frac{30(1492{,}25) - (208)^2}{30(30-1)}$$

$$= \frac{447675 - 43264}{870}$$

$$= \frac{1503{,}5}{870}$$

$S^2 = 1{,}73$

$S = 1{,}32$

While the data on students' mathematics achievement on the subject of logarithms obtained the average is

$$\bar{Y} = \frac{207{,}5}{30} = 6{,}92$$

With standard deviation being

$$S^2 = \frac{N\sum Y_1^2 - (\sum Y_1)^2}{N(N-1)}$$

$$= \frac{30(1499{,}25) - (207{,}5)^2}{30(30-1)}$$

$$= \frac{44977{,}5 - 43056{,}25}{870}$$

$$= \frac{1921{,}25}{870}$$

$S^2 = 2{,}21$

IJEMS: Indonesian Journal of Education and Mathematical Science
2023 Vol. 4, No. 1, pp. 27-35
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S = 1,49

A. Testing the Analysis Requirements

Table II
Normality Test of Student Achievement on the Subject of Exponentiation and Roots

No	X_1	F_1	Fk	Z_1	$F(Z_1)$	$S(Z_1)$	$F(Z_1)$-$S(Z_1)$
1	4	3	3	-2,22	0,0132	0,1	0,0868
2	5	3	6	-1,46	0,0721	0,2	0,1279
3	6,5	6	12	-0,33	0,3707	0,4	0,0293
4	7	7	19	0,05	0,5199	0,63	0,1101
5	7,5	2	21	0,43	0,6664	0,7	0,0336
6	8	3	24	0,8	0,791	0,8	0,009
7	8,5	2	26	1,19	0,883	0,87	0,013
8	9	2	28	1,57	0,9418	0,93	0,0118
9	9,5	2	30	1,95	0,9744	1	0,0256

To test normality is carried out with the Liliefors test, wherein

Total sample (n) = 30 orang
Average Score ($\bar{X}$) = 6,93
Standard deviation (S) = 1,32
L_o from calculation = 0,1279
L table with λ = 0,187
then L_o (Ltabel = 0,1279 (0,161)

Therefore, the students' learning achievement on the subject of exponentiation and roots comes from a normally distributed population. The next step in this study is to test the normality and homogeneity of the variance of each of the following data:

1. Normality Test

The normality test of student achievement on the subject of exponentiation and root used the Liliefors test as shown in the following table.

Table III
Normality Test of Student Achievement on the Subject of Logarithms

No	X_1	F_1	Fk	Z_1	$F(Z_1)$	$S(Z_1)$	$F(Z_1)$-$S(Z_1)$
1	4	3	3	-1,96	0,025	0,1	0,075
2	5	3	6	-1,29	0,0985	0,2	0,1015
3	6	2	8	-0,62	0,02676	0,27	0,0024
4	6,5	2	10	-0,28	0,3897	0,73	0,0597
5	7	7	17	0,05	0,5199	0,57	0,0501
6	7,5	4	21	0,39	0,6517	0,7	0,0483
7	8	3	24	0,72	0,7642	0,8	0,0358
8	8,5	3	27	1,06	0,8554	0,9	0,0446
9	9	3	30	1,40	0,9192	1	0,0808

From the list above Lo = 0.1015, with n = 30 of the real level 0.01 from list XIX (II) obtained Ltabel = 0.187 which is greater than Lo = 0.1015. Therefore, students' learning achievement on the subject of logarithms comes from a normally distributed population.

2. Homogeneity Test

The homogeneity test of mastery of exponentiation and root on solving logarithm problems used Barlett's test as shown in the following table:

Table IV
Homogeneity Test

No	Dk (n-1)	1/dk	S_1^2	$LogS_1^2$	Dk log S_1^2
1	2	3	4	5	6
1	29	1,32	1,32	0,12	3,48
2	29	1,49	1,49	0,17	4,93
Total	**58**	0,06	-		8,41

From the table above, the combined variance is obtained, that is:

$$S_1^2 = \frac{(n_1-1)S_1^2+(n_2-1)S_1^2}{(n-1)}$$
$$= \frac{29(1,32)+29(1,49)}{58}$$
$$= \frac{38,28+43,21}{58}$$
$$= \frac{81,49}{58}$$

IJEMS: Indonesian Journal of Education and Mathematical Science
2023 Vol. 4, No. 1, pp. 27-35
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= 1,405

thus log S^2 = log 1,405 = 0,148, obtained

B = (log bS^2)(n-1)

= (0,148)(58)

B = 8,584

The Barlett Test is as follow:

X^2 = (In 10) {B-$\sum(n_1\text{-}1)S_1^2 + (n_2\text{-}1)S_1^2$}

= (2,3026)(8,584-8,41)

= (2,3026-0,174)

= 2,129

If λ=0,05 with dk=1, this distribution list is squared as seen in the attachment, X^2 0,99(1)=6,63 is obtained X^2 count<x table or it can be stated that the variance of the two data above is homogeneous.

3. Linearity Test

In order to determine whether there is a relationship between variables X and Y by using linear regress Y=a+bx. The determination of the linear regression has been obtained from the calculation of the value ∑x=208, $\sum x^2$=1492,25, ∑y=207,5, $\sum y^2$=1453,75 with the coefficient formula a and b, that is:

$$a = \frac{(\sum y_1)(\sum x_1^2)-(\sum x)(\sum x_1 y_1)}{n\sum x_1^2-(\sum x_1)^2}$$

$$= \frac{(207,5)(1492,25)-(208)(1453,75)}{30(1492,25)-(208)^2}$$

$$= \frac{309641,9-302380}{44767,5-43264}$$

$$= \frac{7261,9}{1503,5}$$

a = 4,83

$$b = \frac{\sum XY_1-(\sum X_1)(\sum Y_{1)}}{n\sum X_1^2-(\sum X_1)^2}$$

$$= \frac{30(1453,75)-(208)(207,5)}{30(1492,25)-(208)^2}$$

$$= \frac{43612,5-43160}{44767,5-43264}$$

$$= \frac{452,5}{1503,5} = 0,301$$

After obtaining the values of a and b, substitute them into the following formula:

y = a+bx

= 4,83+0,301x

To test the linearity of the regression we used analysis of variance:

Jk a= $\frac{(\sum Y_1)^2}{n}$

= $\frac{(207,5)^2}{30}$

= $\frac{43056,25}{30}$

= 1435,21

jk (T) = $\sum Y^2$

= 1499,25

The residual sum of squares is:

Jk (res) = jk (T) – jk(a) – jk(a/b)

= 1499,25-1435,21-4,54

= 59,5

The residual variance is:

$$S(res) = \frac{jk(res)}{n-2}$$

$$= \frac{59,5}{30-2}$$

$$= \frac{59,5}{28}$$

= 2,125

Regression variance is:

$S^2_{(reg)}$= jk (a/b)

= 4,54

Freg = $\frac{4,54}{28} = \frac{jk(\frac{a}{b})}{n-2}$x0,162

S^2 (TC) = $\frac{200,45}{9-2} = \frac{jk\,(TC)}{(k-2)} = \frac{200,45}{7}$=28,64

S^2 (E) = $\frac{jk(E)}{jk(E)} = \frac{jk(E)}{n-k} = \frac{-140,95}{30-9} = \frac{-190,95}{21}$= -6,71

Freg = $\frac{S^2(TC)}{S^2(E)} = \frac{28,64}{-6,71}$ = -4,27

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Tabel V
Anava for Linear Regression

Variance Source	Dk	Jk	KT	F
Total	30	1499,25	1499,25	-
Regression (a)	1	1435,21	1435,21	-
Regression (b/a)	1	4,54	4,54	0,162
Residue	28	59,5	2,125	
Tuna match	7	200,45	28,64	-4,27
Errors	21	-140,95	-6,71	

This means that Fcount <Ftable. Thus it can be concluded that if α = 0.05 then the numerator dk is 7 and the denominator dk is 21 then Ftable = 2.49 is obtained. For the linearity test, F = 4.27 < from Ftable = 2.49. So the linear regression model hypothesis can be adjusted.

B. Hypothesis Testing

Table VI
Data on Mastery of Exponentiation and Roots (x) and Students' Ability to Solve Logarithm Problems

No	X	Y	X^2	Y^2	XY
1	7	6,5	49	42,25	45,5
2	9	9	81	81	81
3	9	7	81	49	63
4	5	6	25	36	30
5	4	7	16	49	28
6	8	4	64	16	32
7	7	8	49	64	56
8	7	8	49	64	56
9	6,5	7	42,5	49	45,5
10	6,5	7	42,5	49	45,5
11	8	7,5	64	56,25	60
12	4	7	16	49	28
13	8,5	9	72,5	81	76,5
14	9,5	7,5	90,25	56,25	71,25
15	9,5	8,5	90,25	72,25	80,25
16	4	9	16	81	36
17	7	4	49	16	28
18	5	5	25	25	25
19	8,5	8,5	72,25	72,25	72,25
20	6,5	8,5	36	72,25	55,25
21	6,5	8,5	36	64	52
22	7	5	49	25	35
23	6	6,5	36	42,25	39
24	8	7	64	49	56
25	7	6	49	36	54
26	6,5	7	42,25	49	45,5
27	5	5	25	25	25
28	7	4	49	16	28
29	7,5	7,5	56,25	56,25	56,25
30	7,5	7,5	56,25	56,25	56,25
Jlh	208	207,5	492,25	1499,25	1453,75

To calculate the correlation coefficient between variables X and Y, the product moment correlation formula is used. From table VI obtained:

$\sum x$ = 208
$\sum x^2$ = 1492,25
$\sum y$ = 207,5
$\sum y^2$ = 1499,25
$\sum xy$ = 1453,75

So tcount = 1.48 while t 0.93 from the student distribution list is = 1.31 thus tcount>ttable. So tcount = 1.48 while t 0.93 from the student distribution list is = 1.31 thus the tcount> ttable. Thus between the mastery of exponentiation and roots from logarithm problems, there is a significant relationship to see how much the contribution of variable x and variable y is used the coefficient of determination r^2 = 0.93 from the student distribution list is = 1.31.

$r^2 = \frac{b(n\sum xiyi-(\sum xi)(\sum yi))}{n\sum y1^2-(\sum y1)^2}$ b = 0,301

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$$= \frac{0{,}301\{30(1453{,}75)-(208)(207{,}5)\}}{30(1499{,}25)-(207{,}5)^2}$$
$$= \frac{0{,}301(43612{,}5-43160)}{44977{,}5-43056{,}25}$$
$$= \frac{0{,}301(452{,}5)}{1921{,}25}$$
$$= \frac{136{,}2025}{1921{,}25}$$

$r^2 = 0{,}27$

From the above calculations, it turns out that the coefficient of determination r^2 is 0,27. This means that the contribution of mastery of exponentiation and roots to solving and logarithms is 27%.

4. CONCLUSION

Based on the research results that have been described, the following conclusions can be drawn:

1. The average result of students' mastery on the subject of exponentiation and roots is 6.93 with a standard deviation of 1.32
2. The average student mastery results on the subject of logarithms is 6.92 with a standard deviation of 1.49
3. The product moment person coefficient value is 0.27
4. The coefficient of determination r2 is 27%

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SOCIAL MEDIA UTILIZATION IN THE DIGITAL ERA

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ABSTRACT

This research was a descriptive qualitative literature review. This research aims to find out the use of social media in the digital age. There are several social media that are frequently used in the digital era such as Instagram, YouTube and WhatsApp. Social media also provides various benefits in various fields, especially in the fields of education and economy. In the education field, social media can be utilized as a learning media to support learning effectiveness. Meanwhile, in the business sector, social media can be used to increase sales and advertising at a more affordable cost.

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1. INTRODUCTION

The digital era is a time when community activities and information are disseminated more quickly and easily using digital technology. Digital technology is technology that uses a computer system connected to the Internet. In this case, the Internet plays an important role in the digital age. Internet connectivity is also increasingly advanced to support community productivity in the digital age. The ease of Internet connectivity makes it easier for people to disseminate information through their devices. One of the most widely used means of disseminating information is social media.

Social media is very important in disseminating information to the wider community. Since its inception, social media has been designed as a platform for its users to easily participate, share and exchange information/ideas in a community or virtual network. The development of social media currently makes it easy for people to view and find information online (D. N. Sari & Basit, 2020). Social media users can play an active role in choosing and using these media (Harbert Blummer and Elhu Katz, 1974). In today's digital age, it is easy for many people to find information, knowledge and sources that are easily accessible.

Social media also makes it easier for us to interact with many people without worrying about distance and time. It is easier for us to be creative and spread information faster and at a much more affordable cost. Not only that, social media is also widely used as a means of earning income, da'wah institutions, facilitating the learning process, distributing information and news, as well as a place to express our hobbies and ideals. Some examples of social media in today's digital age are Instagram, TikTok, YouTube, Twitter and blogs/websites. Social media can be used according to our needs and the benefits we get from it. Along with the numerous benefits of social media, there are also negative effects if we do not use them carefully.

2. METHODOLOGY

The method used in this research was descriptive qualitative. Descriptive qualitative is a research that describes or depicts the object of research based on the facts that appear or as they are. This research describes the various types of social media used in the digital age and the benefits of using social media in the digital era. The data collection technique in this research was library research or literature study.

Literature study is to record all issues in research, unite existing research and new research, analyse research from various sources/references discussed, provide ideas from existing research results and generate new thoughts (M. Sari & Asmendri, 2018). The literature review uses various references (articles, scientific journals, books, dissertations, theses, internet) that are relevant to the discussion of the use of social media in the digital era.

3. RESULT AND DISCUSSION

A. Types of Social Media in the Digital Age

Social media is a media that allows users to represent themselves in interacting, building cooperation, sharing and communication with other users in forming virtual social relationships (Nasrullah, 2015). Some social media platforms that are widely used in the digital era are as follows:

1. Instagram

Instagram is a social media platform that is popular and favoured by the public and can be accessed through devices or laptops. Instagram was founded by one of the best known companies, Burbn, Inc with founders Kevin Systrom and Mike Krieger. Instagram is designed to share information through a post in the form of a photo or video. According to Napoleon Cat, Instagram users in October 2021 totalled 91.01 million users, a number that is reported to have decreased compared to August 2021, which totalled 98.06 million users (Annur, 2021). The majority of Instagram users are aged 18-24 years old. This is the age of students, especially university students (Keifer & Effenberger, 1967) (Ambarsari, 2020).

The role of Instagram in the digital age is as a place to share photos and videos that we have, both privately and together. Many people use Instagram as a place to express their hobbies in the form of photos and videos, such as a video of someone playing a musical instrument and exercising. Instagram is also widely used by artists as a forum to become a brand ambassador or endorsee by posting on Instagram feeds or Instastories related to the goods or products they wish to endorse, providing product details both written and verbal, the benefits and uses.

2. Youtube

YouTube is one of the platforms created by 3 paypal employees, in February 2005, and is widely used in this era of digitalization. The YouTube channel is widely used as a place to share hobbies, preach, vlogs, blogs, and other content that is interesting, cool, funny, sad, horror, and other content that can attract viewers to visit our YouTube channel. YouTube is widely used as a place to share hobbies, preach, vlog and so on. In addition, many YouTube users use the platform to listen to music, watch short films, trailers, news and so on.

In general, YouTube users visit the application not only for entertainment, but also for academic and information purposes. The largest number of YouTube users is between the ages of 18 to 29 years. The Central Bureau of Statistics

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suggests the results that this age include teenagers to college students. In this case, YouTube also plays a very important role in the age of digitalisation.

3. WhatsApp

WhatsApp is one of the free applications for Android and iOS platform users that offers a very simple and safe messaging and calling service to use whenever and wherever we are. This application was founded by Jan Koum and Brian Acton.

In this digital era, WhatsApp is often used to communicate with the wider community, as a learning media and as an online trading media. WhatsApp is used for commercial purposes by offering products through contacts saved in WhatsApp, by sending and offering products through broadcast messages, or by sending them to groups that we have joined. However, the majority of people use WhatsApp to communicate virtually, both through chat and through live and video calls.

As a learning medium, WhatsApp is used in online learning. WhatsApp allows students to share material or knowledge using status or WhatsApp Story. In addition, students can share photos, videos or website links through status. Students can have virtual discussions using video calls to discuss learning.

B. The Benefits of Social Media in the Digital Age

In the current digital age, social media provides many benefits for different sectors. The benefits of social media that we most frequently find are in the areas of education and economy. Here are the benefits of social media in the digital age in the fields of education and economy.

1. Education Sector

The use of social media in education is currently widespread. Based on the recent research conducted by We Are Social and Hootsuite, it was revealed that Indonesians have a large number of social media users, reaching 130 million active users using various social media such as Instagram, Twitter, Facebook and others. Furthermore, We Are Social's report in January 2018 also revealed that Indonesia's total population reached 256.4 million occupations, with internet user penetration reaching 132.7 users. With the high number of social media users in Indonesia, it is not difficult to use social media as a learning medium.

Through social media, a variety of knowledge can be accessed by students, making them more active in exploring and innovating to enhance their creativity. The ease of accessing information digitally makes them more independent as they do not have to wait for the teacher to explain in class. Social media can also be used as a platform to develop language skills. These language skills start from reading, understanding and selecting different information to develop their writing skills through captions, which can be narratives, poems or other writings and works that are then shared through the features available on social media (Achmad Ridwan, 2021).

This is one of the advantages of social media, which is the wide range of interaction activities and information sharing (Selwyn, 2009). In order to use social media as a learning medium, there are several aspects that need to be considered. There are five aspects that need to be considered when using the media, which are (a) student characteristics, (b) learning objectives, (c) the nature of the teaching materials, (d) the acquisition of the media, and (e) the nature of the use of the media.

In addition to the advantages for students, social media also has an impact on teachers. Teachers in the digital age are teachers who are able to integrate technology into their learning. One of the requirements for a professional teacher in the digital era is a teacher who, in addition to the pedagogical, personal, social and professional competencies mentioned above, also has insight, interest, concern, sensitivity, affection, as well as the ability and skill to use it. The use of digital technology is very important for the following reasons:

a) The quality of education in Indonesia falls far behind other countries.
   This gap is due to the low quality of teachers, and the reasons include the low quality of teachers in terms of insight, interest, concern, sensitivity, preference, and ability and skill in using technology.
b) Relevant functions of digital technology to be integrated in learning
   Sudarno Sudirdjo and Eveline Siregar (2004:9-12) found that there are eight functions of learning technology, including digital technology, which are (1) to provide knowledge of learning objectives, (2) to motivate students, (3) to present information, (4) to stimulate discussion, (5) to guide student activities, (6) to conduct exercises and tests, (7) to reinforce learning, and (8) to provide simulation experiences.
c) Digital technology is a revolutionary process that needs to be embraced.
   The concept of learning in a digital society emphasises moving, motivating, bridging, facilitating, so that students are moved to carry out various activities in order to obtain the knowledge they want. This is then reinforced, enriched or corrected by the teacher. Teachers must teach to keep up with the times by integrating technology into learning.

Therefore, learning media can be utilised by teachers as learning media to improve learning effectiveness. Some of these benefits are:

a) As a means of communication
   Social media facilitates communication between students, teachers, and families. When students find it difficult to learn in class, social media helps students to communicate further so that learning can be absorbed better.
b) Supporting online learning activities
   Learning media can be used to support online learning to make it more effective and not monotonous.

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c) Enhancing creativity
Social media can be used to improve skills and means of self-expression. Learning using social media can also be used as a way to increase and spur student creativity.
d) Means of supporting research
Social media can be used as research material, and tools in research for example, the use of online form applications and the use of data available online, etc. In addition, another benefit is that students can also join various researchers as followers according to the research topic.
e) Means of globalisation
Through social media, interaction between students and various people in the world is possible. Students can get to know people from different cultures from other countries such as language, tradition, lifestyle etc. In addition, it also allows students to get course opportunities from various schools across the country, some even for free because it is done online.

2. Economy Sector

The utilisation of social media in the digital era also extends to the economic field or known as the digital economy. Digital economy is an economic activity that utilizes the help of the internet and artificial intelligence (AI). The existence of a digital economy can facilitate economic activities in general, especially in the business world. Social media has provided special features for businesses. Here are some of the benefits of social media for business:

a) Increase sales
b) Find potential customers quickly
c) Give feedback faster and easier
d) Attract consumers
e) Increase website visitors
f) Branding
g) Share information faster
h) Promote at an affordable cost

4. CONCLUSION

In the digital age, community activities and information are disseminated more quickly and easily through digital technology. When it comes to disseminating information to the wider community, social media is crucial. Social media also makes it easy for us to interact with many people without worrying about distance and time. Some social media platforms that are widely used in the digital age are Instagram, Youtube, Whatshapp, Facebook, Twitter and Tiktok. There are many benefits from the use of social media in today's digital age, both in education, business, social and other areas. The use of social media can be used as a source of knowledge, a source of entertainment and a source of the latest information.

Based on the results of the research and the results of the discussion described in the previous chapter, the following suggestions can be made:

3. Information on social media is sometimes a hoax. Therefore, people need to filter this information wisely.
4. For further research, if you want to conduct research that is relevant to this research, it is hoped that you can get results that were not found in this study in order to get different results regarding the use of social media in the digital age.

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MONITORING AND EVALUATION STRATEGY SCHOOL INTERNAL QUALITY ASSURANCE SYSTEM

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ABSTRACT

Strategy for Monitoring and Evaluation (Monev) of the School Internal Quality Assurance System, 2022. This article aims to find out the strategies that must be carried out in monitoring and evaluation activities in the school's internal quality assurance system. Monitoring and Evaluation has objectives in terms of the interests of decision making, systematic data collection, and program improvement. The monitoring and evaluation approaches used are social system reporting (social experimentation), social auditing and material collection (social accounting), social experimentation for social research (social research cumulation). While the monitoring and evaluation technique carried out is by observation technique, namely by making direct visits to the activity site. The monitoring process is carried out with the planning stage, namely by identifying the things to be monitored, the implementation stage by measuring the teacher's skills in using teaching methods, and the reporting stage, by determining whether work performance meets predetermined standards.

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1. INTRODUCTION

Law No. 20 of 2003 concerning the National Education System states that the National Education System is the entire educational component that is interrelated in an integrated manner to achieve the goals of national education, namely to develop capabilities and improve the quality of life and human dignity of Indonesia.

On the other hand, the enactment of Law No. 32 of 2004 concerning Regional Government has had an impact on the management of education in the regions. On the one hand, the educational autonomy policy has a very positive effect on the development of schools as educational institutions based on the needs and challenges, they face. The diversity of potential educational resources in the existing regions causes the quality of school output to vary greatly. The existence of educational units both in terms of level and type in Indonesia which are spread throughout the Unitary State of the Republic of Indonesia has a variety of service processes, facilities, and infrastructure, teaching and educational staff, and their quality. Therefore, regional, and national quality standardization is one of the factors that must be considered in efforts to guarantee and improve the quality of education.

Indicators of school success in carrying out its program can be seen from the suitability of the process with what is planned, suitability in achieving goals, effective and efficient use, and utilization of resources, as well as the ability to provide guarantees for the suitability of processes and achievement of goals through a harmonious and intact control mechanism. in system.

In its management, schools need monitoring and evaluation in order to achieve the goals of education so that the process can be carried out properly. Monitoring and evaluation are an integral part of education management, both at the micro (school), meso (District/City Education Office, and Provincial Education Office) and macro (department) levels. This is based on the premise that with monitoring and evaluation, we can measure the level of progress in education at the school level, District/City Education Office, Provincial Education Office, and Departments.

Without measurement, there is no reason to say whether a school is progressing or not. Monitoring and evaluation generally produce information that can be used for decision making. Therefore, useful monitoring and evaluation is monitoring and evaluation which produces fast, precise, and sufficient information for decision making.

The process of monitoring the implementation of the work of subordinates is carried out to obtain facts, data, and information in the process of achieving goals, is it in accordance with predetermined standards? No deviations occur? Monitoring requires leaders to directly see the processes that occur, also with the support of documents and opinions from those being monitored, this is done as validation and legitimacy of the monitoring process. These data and facts are then used as a reference for leaders to evaluate projects undertaken, programs prepared or even to the point of plans that have been made.

In the institutional context of school monitoring carried out by the principal, especially in the administrative activities of the teacher and the learning process carried out, it means that the principal through monitoring must know *"What's happening behind the door."* Next, do an evaluation so that if an error or deficiency occurs it can be addressed immediately and a solution is found.

The internal quality assurance system is a quality assurance system implemented in and by certain educational units and involves all components within the educational unit. Nationally, the quality of secondary education in Indonesia has not been as expected. The results of mapping the quality of education nationally show that only about 16% of education units meet national education standards (SNP) (Directorate General of Elementary and Secondary Education. 2016). Most of the other educational units have not met the SNP, and there are even a few educational units that have not met the Minimum Service Standards (SPM). Standard.

Efforts to guarantee and improve the quality of education are closely related to quality management, where all management functions are carried out as much as possible to provide services that match or exceed national education standards. In this regard, efforts are needed to control quality (quality control). Quality control in the management of education is faced with the constraints of limited educational resources. Therefore, a quality control effort is needed in the form of a guarantee or assurance, so that all aspects related to the educational services provided by schools comply with or exceed national education standards. The concept related to this in quality management is known as Quality Assurance or quality assurance.

Literatur Review

A. Basic Concepts of Monitoring and Evaluation

School monitoring and evaluation can be done in two ways, namely internal and external. What is meant by internal monitoring and evaluation are those carried out by the school itself, namely the principal, teachers, students, parents, and other school members. The main objective is to determine the level of progress itself (school) in relation to the goals that have been set. In this way it is hoped that the school will understand the level of achievement of the target, find the obstacles encountered and notes for the preparation of the next program.

Whereas external monitoring and evaluation can be carried out by parties outside the school, for example, supervisors, the education office whose results can be used for reward systems for individuals, schools in the context of increasing a climate of healthy competition between schools, the interests of public accountability, for improving the existing system as a whole and helping school to develop itself.

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In order to be able to obtain the implementation of plans in accordance with what is planned, management must prepare a program, namely monitoring, monitoring is aimed at obtaining facts, data, and information about program implementation, whether the process of implementing activities is carried out according to what has been planned. Furthermore, the findings of monitoring results are information for the evaluation process so that the result is whether the program that has been determined and implemented has obtained appropriate results or not.

The most principal thing in the implementation of monitoring and evaluation is that the reference for monitoring activities is the provisions that are agreed upon and enforced, then the sustainability of the activities must be maintained, in the implementation objectivity is highly considered and the main orientation is towards the objectives of the program itself. Monitoring and evaluation of educational units provides benefits for both students or education participants, teachers, and management, as well as management of educational units. From the educator's point of view, the results of the evaluation can be used as feedback to determine efforts to improve the quality of education.

Monitoring and Evaluation (ME) are two words that have different aspects of activity, namely the words Monitoring and Evaluation. Monitoring is an activity to find out whether the program made is running well as it should according to plan, whether there are obstacles that occur and how the implementers of the program overcome these obstacles. Monitoring of an ongoing planning result is a good control tool in the entire implementation process, as shown in the following figure:

"Monitoring places more emphasis on monitoring the implementation process" (Ministry of National Education: 2001). Monitoring is also more emphasized for supervision purposes.

The basic process in this monitoring includes three stages, namely: (1) setting implementation standards; (2) implementation measurement; (3) determine the gap (deviation) between implementation and standards and plans.
According to Dunn (1981), monitoring has four functions, namely:

a. Compliance. Monitoring determines whether the actions of administrators, staff and all those involved follow established standards and procedures.
b. Examination (auditing). Monitoring determines whether resources and services destined for certain parties for certain parties (targets) have reached them.
c. Reports (accounting). Monitoring produces information that helps "calculate" the results of social and societal changes as a result of policy implementation after a certain period.
d. Explanation. Monitoring produces information that helps explain how the impact of policies and why the planning and implementation do not match.

The existence of monitoring and evaluation in managing schools is needed to form an effective school, so that a standard has been set. Management standards are national education standards relating to the planning, implementation, and supervision of educational activities at the education unit, district/city, provincial or national level in order to achieve efficiency and effectiveness in the delivery of education. So that in this case, the management of the education unit will be the responsibility of the head of the education unit.

The following are monitoring and evaluation standards that must be met and implemented by schools:
– Aspects of the surveillance program,
- Self-evaluation,
– Evaluation and development,
– Evaluation of the utilization of educators and educational staff,
– As well as school accreditation.

Management of education units is carried out based on minimum service standards with the principles of school-based management (SBM), autonomy, accountability, quality assurance, and transparent evaluation.

Evaluation, development, and quality assurance in the application of school-based management principles focuses on the following activities:
– Implementing data-driven standards,
– Increasing school autonomy,
– Improving quality improvement management principles,
- Implement a quality assurance system,
– And carry out continuous evaluation.

Assessment (Evaluation) is a stage that is closely related to monitoring activities, because evaluation activities can use data provided through monitoring activities. In planning an activity, evaluation should be an integral part, so that it can be said to be a complete activity. Evaluation is directed to control and control the achievement of goals. Evaluation relates to the results of information about the value and provides an overview of the benefits of a policy. The term evaluation is close to interpretation, scoring and assessment. Evaluation can answer the question "What difference did it make". (William N Dunn: 2000) [1].

Evaluation aims to find out whether the program achieves the expected goals or not, evaluation emphasizes more on the aspects of the results achieved (output). Evaluation can only be carried out if the program has been running for a period, according to the stages of design and the type of program that is made and implemented, for example at school, for one quarter or six months or one school year.

B. Objectives Of Monitoring and Evaluation

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In carrying out the process of monitoring and evaluating the management of educational units, of course there is a goal in it. The objectives of conducting monitoring and evaluation in managing schools include:

1) For the purposes of decision making, for example regarding whether a system, strategy or method will be used.
2) Evaluation research is a systematic data collection activity to assist decision makers. Evaluation researchers believe that the results of their work will benefit decision makers in making better decisions than if no research was conducted.
3) To improve the program, program eligibility, the program is continued or terminated, changed, or replaced.
4) Meanwhile, Suharsimi Arikunto & Cepi Safruddin (2004) [2] stated that there are two types of evaluation objectives, namely specific objectives, and general objectives. General objectives are directed at the program, while specific objectives are directed at each component.

Monitoring results can be used to provide input (feedback) for improving the implementation of school management. While the evaluation results can provide information that can be used to provide input on all components of school management, both in context, input, process, output, and outcome.

C. The Functions of Monitoring and Evaluation

The decision-making process to run or stop/change one or several related programs is carried out through an evaluation process. The oversight function within the framework of monitoring and evaluation activities, especially in relation to the activities of the leaders in their duties and responsibilities, is as follows:

a. Strengthening the sense of responsibility towards officials entrusted with duties and authority in carrying out work.
b. Target officials so that they carry out their work in accordance with predetermined procedures.
c. To prevent the occurrence of irregularities, abnormalities, and weaknesses in order to avoid unwanted losses.
d. To correct errors and irregularities so that the implementation of work does not experience obstacles and wastes.

Evaluation according to Moh. Rifai (1986) as an activity that cannot be separated from monitoring activities has the following functions:

a. Evaluation as a measure of progress;
b. Evaluation as a planning tool;
c. Evaluation as a means of improvement.

With the description above, it can be explained that the main monitoring functions are: measuring the results that have been achieved in implementing the program with measuring tools that have been made and agreed on; analyze all monitoring results to be used as material in considering decisions as well as improvement and refinement efforts (Soewardji Lazaruth: 19940 [3].

D. The Principles of Monitoring and Evaluation

The most principal thing in the implementation of monitoring and evaluation is that the reference for monitoring activities is the provisions that are agreed upon and enforced, then the sustainability of the activities must be maintained, in the implementation objectivity is highly considered and the main orientation is towards the objectives of the program itself.

The monitoring principles are as follows:

1) Monitoring must be carried out continuously
2) Monitoring should be bait for improving organizational program activities
3) Monitoring must benefit both the organization and the users of the product or service.
4) Monitoring must be able to motivate staff and other resources to excel
5) Monitoring must be oriented to the applicable regulations
6) Monitoring must be objective
7) Monitoring must be oriented towards program objectives.

As for the principles of evaluation, Nanang Fattah (1996) [4] suggests there are 6 principles, namely:

1) The principle of sustainability, means that it is carried out continuously.
2) Overall principle, meaning that all aspects and components of the program must be evaluated
3) Objective principle, meaning that the implementation is free from personal interests.
4) The valid principle, which contains consistency that measures what should be measured.
5) The principle of critical use
6) The principle of usability or benefit

Other basic principles:

1. Monitoring and Evaluation System made simple; adjusted to the capacity and available resources. This is to avoid implementation difficulties in the field.
2. Clear goals. Monitoring and evaluation activities are focused on matters that are relevant to the objectives of the monitoring itself which are linked to the activities and objectives of the program. Do not collect data that is not relevant to program needs. It is necessary to make a logframe, intervention logic model, and a monitoring and evaluation work plan which include details of the performance indicators to be monitored.
3. done on time; this is the essence of Monitoring because the availability of data on-time is needed for management/data users to resolve problems in a timely manner. In addition, the timeliness of monitoring is also important to obtain accurate data in monitoring certain objects at the right time.

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4. Information on monitoring and evaluation results must be accurate and objective; Inaccurate and objective information can cause false alarms. A mechanism is needed to check the consistency and accuracy of the data.
5. The monitoring and evaluation system is participatory and transparent; it is necessary to involve all stakeholders in the preparation of the design and its implementation, and the results can be accessed by all parties.
6. The monitoring and evaluation system is made flexible; in the sense that it is not rigid but can be adapted to the needs and conditions but still within the limits of the SOP corridor.
7. It is action-oriented; Monitoring is expected to be the basis for decision making and action. Therefore, from the start, it is necessary to carry out an information needs analysis to ensure that monitoring data will be used to act.
8. Monitoring and evaluation activities are carried out in a cost-effective manner.
9. The monitoring and evaluation unit consists of specialists who are not only tasked with collecting data but also conducting problem analysis and providing practical problem-solving recommendations.

E. Monitoring and Evaluation Techniques and Approaches

Techniques in implementing monitoring can be carried out through direct observation of the process, interviews with key sources/actors, and limited discussion activities through group discussion forums to obtain clarification of program implementation.

1. Approach

There are various ways to monitor outputs and impacts. Those methods are reporting social systems (social accounting), social experimentation (social experimentation), social auditing (social auditing) and gathering material for social research (social research cumulation). Each of these approaches has two aspects, namely aspects related to the type of information needed (Dunn, 1981). This can be described as in the diagram below:

Comparison Chart between the Four Approaches in Monitoring

Approach	Control Type	Type of Information Required
Social system reporting	Quantitative	Existing/new information
Social experimentation	Direct and quantitative manipulation	New information
Social check	Quantitative and/qualitative	New information
Collection of materials for social research	Quantitative and/qualitative	existing information

These four approaches have the same characteristics, namely that they: (1) are focused on policy outputs, so that in this monitoring it is very important to pay attention to variables that affect output, both those that cannot be controlled by policy makers (for example, current conditions that already exist), and variables that can be manipulated or foreseen; (2) goal-centered, namely to provide the satisfaction of needs, values or opportunities to clients or targets; (3) change-oriented. Each of these approaches seeks to monitor changes over a certain period of time, either by analyzing changes in performance between different programs or those with the same number of variables, or a combination of the two; (4) allows cross-classification of outputs and impacts based on other variables including variables used to monitor policy inputs (time, money, effort, equipment) and policy processes (activities, and administrative, organizational and political attitudes required for the transformation of policy inputs become output), and (5) related to aspects of policy implementation objectively and subjectively. Objective indicators are based on new data obtained through sample surveys or field studies (Dunn, 1981).

2. Observation Techniques,

Observation is a visit to the place of activity directly, so that all ongoing activities or existing objects are observed and can be seen. All existing activities and objects as well as existing supporting conditions receive direct attention.

Interviews and questionnaires

Interviews are the way to do when monitoring is aimed at someone. The interview instrument is an interview guide. There are two types of interviews, namely direct interviews, and indirect interviews.

Forum Group Discussion (FGD)

FGD is a process of equalizing perceptions through brainstorming on a particular problem or substance so that a frame is obtained in viewing and responding to the matters in question.

PERT (Program Evaluation Research Task) and CPM (Critical Path Method)

Pert	CPM
Probabilistic	Deterministic
Event oriented	Activity oriented
Not based on experience	Based on experience
Multi time estimation	One time estimate

Gantt Chart (PBM Model Development Based on Agriculture)

Activity/Occupation	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Programming	→											
Socialization		→										

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Teacher training			→									
Preparation of monitoring and evaluation instruments			→									
Implementation			→	→	→	→	→	→	→	→	→	
Monitoring			→	→	→	→	→	→	→	→	→	
Evaluation												→
Reporting												→

Scheduling Network

$$Te = \frac{A+4M+B}{6}$$

Te =Time Estimated
A = Optimist Time
B = Pessimistic Time
M = Most probable time

F. Monitoring and Evaluation Process

Monitoring and evaluation is carried out by following the steps, first carrying out activity planning activities, where the steps and procedures as well as the content components to be monitored and evaluated are properly prepared, secondly the implementation of the monitoring and evaluation activities themselves, and thirdly reporting the results of activities in the form of a written report as material for evaluation and feedback on the programs that have been carried out.

1. Planning Stage

Preparation is carried out by identifying the things to be monitored, what variables will be monitored and using which indicators are in accordance with the program objectives. The details of the variables to be monitored must be clear first, and the boundaries and definitions must be clear. "Variables are characteristics of a person, an event or an object that can be expressed with different numerical data." (William N Dunn: 2000).

2. Implementation Stage

This monitoring is to measure teachers' skills in using teaching methods. After ensuring the correct definition of the variables being monitored and their indicators, carry out the monitoring. The indicators that are measured in terms of teaching preparation are:

- There are general and specific learning objectives;
- Appropriateness of choosing a method for the learning objectives that are arranged;
- Use of teaching facilities or media;
- The suitability of the method with the media to be used;
- There are evaluation stages and evaluation tools;
- Appropriateness of methods with evaluation tools;
- Appropriateness of evaluation with learning objectives

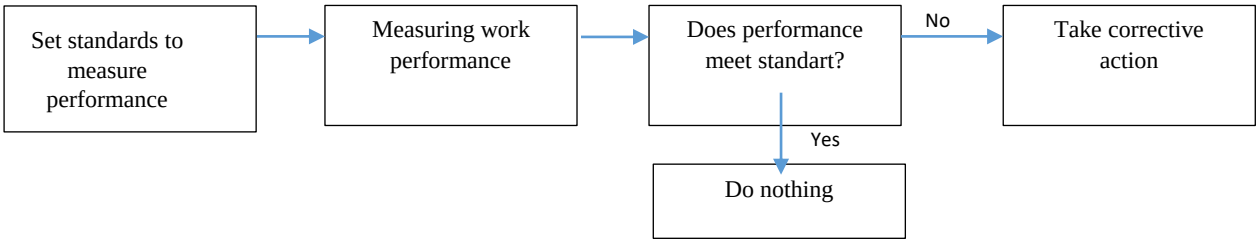
Monitoring during the implementation of the learning program, the indicators and processes carried out are:

- Provisions and time management;
- The accuracy of the method used;
- There is an appropriate explanation for the use of the method; The use of media in accordance with the expectations of the method;
- Carry out learning evaluations;
- There is a follow-up of the program;

Post-program monitoring, namely monitoring after learning is complete. Of course, this concerns the attitudes and actions of students related to learning objectives.

3. Reporting Stage

Nanang Fattah (1996) suggests monitoring steps as shown in the following diagram:



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In the third step, namely determining whether the work performance meets predetermined standards and here there is an evaluation stage, namely measuring the activities that have been carried out with the standards that must be achieved. Furthermore, these findings were followed up and the results became a report on the program.

2. METHODOLOGY

The method used in writing this article is literature study, which is a data collection technique by conducting a review study of books, literatures, notes, and reports that have something to do with the problem being solved (Nazir, 2000:111) [5]. Thus, the author completes this article by studying and reading literature related to the isues of monitoring and evaluation strategies in school quality assurance.

3. RESULT AND DISCUSSION

The Relationship Between Monitoring and Evaluation of School Quality Improvement

Often the "policy makers" see that much effort is made to improve the quality of education through the provision of complete facilities, curriculum renewal or building construction, without realizing that one of the components in the education management process is often neglected which produces the most valuable information in improving the quality of education. The component that is often overlooked in its wider use is none other than monitoring and evaluation.

In the earlier part it was mentioned that the results of monitoring and evaluation are information that can be used to improve and perfect education programs. In addition, this information can be used for the purposes of certification, selection, remedial, promotion and so on. seita for implementation accountability to interested parties (Jahja Umar. 1992:12). Currently, monitoring and evaluation is only related to the academic achievement achieved by each student, namely in the form of numbers, and even if feedback is presented for improvement, it is only used for very micro purposes, such as improving teaching methods or developing teaching materials (Cece Hernia'wan. 1990).

The relationship between monitoring and evaluation with the quality of education can be described in the following diagram:

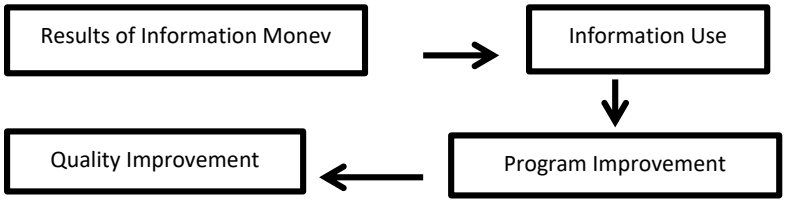

Figure 1. The relationship between monitoring and evaluation with the quality of education

In the chart above it appears that the results of monitoring and evaluation are in the form of information on various matters (curriculum, teachers, student achievement and so on). These data are also used for various purposes as stated in the previous section, including for the improvement and refinement of programs so that the quality of education is achieved. expected to increase.

Based on the statement above it is clear that the results of monitoring and evaluation in the form of information can diagnose the components that affect the improvement of education quality. Because of that, it's a good idea to pay attention to the indicators of quality and low-quality schools adapted from the views of several experts (Engkoswara, Yahya Umar, LIPI):

Quality School	Poor Quality School
1. Correct input	1. Input a lot
2. High morale	2. Implementation of casual work
3. High learning motivation	3. Relaxed learning activities
4. Proportionate use of costs, time, facilities, personnel	4. Wasteful use of resources
5. The trust of various parties	5. Less concerned about and from the environment
6. Qualified graduates	6. Graduates pulley results
7. Outputs that are relevant to community needs.	7. Unproductive output

In order to obtain appropriate, appropriate and meaningful information through monitoring and evaluation, factors such as monitoring and evaluation instruments, school principals who carry out monitoring and evaluation, aspects that are monitored and evaluated and monitoring and evaluation situations need attention so that the role of monitoring and evaluation is carried out. evaluation in improving the quality of schools to be more functional.

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4. CONCLUSION

School management in order to guarantee the internal quality of schools is based on program planning, implementation of work plans, monitoring and evaluation, school leadership, and management information systems. The school develops a program plan starting from establishing a vision, mission, goals and work plans.

In its management, schools need monitoring and evaluation in order to achieve the goals of education so that the process can be carried out properly and to find out whether a school is progressing or not. Monitoring and evaluation generally produce information that can be used for decision making. Therefore, useful monitoring and evaluation is monitoring and evaluation which produces fast, precise, and sufficient information for decision making. Monitoring and evaluation standards that must be met and carried out by schools include: aspects of the supervision program, self-evaluation, evaluation and development, evaluation of the utilization of educators and education staff, and school accreditation.

Monitoring and evaluation of school management aims to obtain information that can be used for decision making. Monitoring results can be used to provide input (feedback) for improving the implementation of school management. While the evaluation results can provide information that can be used to provide input on all components of school management, both in terms of context, input, process, output, and outcome. Inputs from monitoring and evaluation results will be used for decision making.

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IMPLEMENTATION OF EDUCATIONAL MANAGEMENT FUNCTIONS AT SMP MUHAMMADIYAH 06 BELAWAN

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ABSTRACT

To build an organization including school organizations, management is very important. Notes some schools have slumped even to the point of bankruptcy because of bad management. This study aims to describe and analyze: (1) curriculum and learning management; (2) Student management; (3) Educator and education management personnel; (4) Facilities and infrastructure management; (5) Funding Management at SMP Muhammadiyah-06 Belawan.

The research method uses a descriptive qualitative approach. Data collection techniques are carried out by interviews, documentation and observation. The results of this study are: 1. Curriculum management and learning at SMP Muhammadiyah-06 Belawan is carried out using the POAC management function. 2. Students management is going well. 3. The management of educators and educational staff has been carried out both based on management function. 4) Management of facilities and infrastructure in accordance with management standards. 5) Financing management is managed in an accountable manner

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1. INTRODUCTION

Education is a changing process man become more well , more proficient and skilled . For reach objective the role as well as teachers and principals very important . Every parent realize that child is future assets and they are later that will continue and maintain nation this , that 's it why parents will school his son for later become religious child , intelligent and skilled . This is what SMP Muhammadiyah-06 Belawan has to offer that they try For answer desire society and proven be one school choice and be the goal of the parents who want school his sons and daughters especially in the District of Medan Belawan .

One characteristic typical from school This is exists eye lesson especially on the Tahfidz taught since student was in class VII to class IX. Curriculum from eye lesson This naturally Already customized in accordance with age participant educate . This is what is one Power attract parents For school their children at school this . School This make an effort For build soul participant he taught to front For become a moral and religious person , that is with embed paradigm religious for kids .

Management always make an effort do innovation and develop new ideas Good in method learning For students and patterns proper management for teachers and staff. such thing need done remember quality something institution education No only determined by quality learning only , but also influenced How institution education the capable manage source Power the human with give motivation and potential to be able do your best For institution .

essence A education is A effort For increase quality civilization human , therefore That every educational process will try develop wide potency individual as A element important For develop and change pattern think participant educate so that later they become strong and virtuous generation . For realize objective glorious the naturally must arranged with management good management _ as well as planned . (2019:2).

Literature Review

A. Function Management

In A management there is activities particular, named as functions management , which consists from function planning , organizing , actuating / directing and supervising . (Yayat M. Herujito , Fundamentals of Management , Jakarta: PT Grasindo , 2006, pp . 84-90).

Can taken conclusion management art arrange use source Power man in something organization For get high and maximum performance _ in various type profit organization or non profit .

In management there is someone on duty For carry out management That itself , that is on duty For organize , organize , and control something organization (manager). Leadership is also said as one _ function very management _ important For reach objective from A organization or institution in a manner effective and efficient , Kristiawan , Muhammad, (2017: 114).

B. Education

According to Sujana (2019, p. 29) says "Education is effort For help soul children educate Good born nor inner , from characteristic his nature going to Toward civilization more human. Education as something method For develop skills , habits and attitudes expected to be able to make somebody become more ok .

C. Function Education Management

Shamsuddin explain that education national in fact business civilize man or humanize humans (Samsuddin , 2017). In realize something quality education naturally needed something good management . _ Management must applied in effort maintenance activity Study teach Because with apply aspect management like planning (planning), organizing (organizing), supervision (controlling), as well evaluation (evaluation). According to Mulyono in the process of implementation, management have tasks special must implemented (Mulyono, 2008). Planning in institution education is a process of rational and systematic activity in set decisions, activities or steps to be implemented later day in framework business reach objective in a manner effective and efficient . Implementation is a process of connecting and uniting task as well as function in organization or institution . Evaluation is one function trying management stage appraisal , conduct correct to all things that have done by subordinates so that can directed to the right way in accordance with purpose.

2. METHODOLOGY

Study This held at SMP Muhammadiyah-06 Belawan . School This located on Jl. Col. Yos Sudarso , Belawan Bahari , Medan Belawan City, Medan City, North Sumatra. Study This use approach qualitative design studies case . By design studies case is one method study sciences social which is suitable strategy If question something his research is how and why . Study qualitative its nature descriptive analytic on the data presented in form of the word or picture . Denzin and Lincoln inside Moleong (2013:5) states that study qualitative is research using background natural with Meaning interpret phenomena that occur and do with road involve various existing method . _

Miles and Huberman in Moleong (2013:4), stated that presence study at location in A study qualitative is something absolute , because researcher Act as instrument research and at the same time as data collector . Profits earned _ from presence researcher as instrument is subject more responsive will presence researchers , related decisions _ with study can taken with fast and purposeful , also with information can obtained through attitude and manner informant in give information .

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Method qualitative develop when happening change to paradigm in looked something reality, phenomenon , and observed symptoms . Moment happening change paradigm such , reality social has seen and understood as holistic , complex , dynamic , and full _ with meaning . (2020:146)

Deep data collection study This done with use three technique used _ in data collection , namely : interviews with informants , observations or observation and study documentation . Qualitative data analysis is efforts made _ with road Work with data, organizing data, sorting through it become manageable units , search and find pattern , find what is important and what is learned and decided what can told to others (Moleong 2013:248).

Activity presentation findings, researchers will displays in a manner detailed, systematic, and interesting in form explanations and pictures . The process of data analysis is based on the simplification and interpretation of the data carried out before , during and after the data collection process . The process of data analysis is based on the simplification and interpretation of the data carried out before , during and after the data collection process . mutual process related namely data reduction, data display, and conclusion drawing and verification (Sugiyono , 2012:335).

3. RESULT AND DISCUSSION

Management in a manner general interpreted as management, arrangement or setting. Management according to RW Griffin in Ice Zakiyudin (2016:1) is series activity including planning and manufacture source - directed decision , organizing , leading and controlling _ Power organization (energy work , financial , physical and information) for the purpose For reach target organization with effective and efficient way . Whereas management according to Terry inside Ambarita (2013:18) exists four function management namely : 1) Planning (planning), 2) Organizing (organizing), 3) Actuating (implementation), 4) Controling (Supervision). According to Burhanuddin et al (2013: 7) between substance from management education are : 1) Curriculum and learning , 2) Participants educate , 3) Educators and personnel education , 4) Facilities infrastructure , 5) Financing .

Whereas according to opinion Abidin Nata (2008:24) that management education is the whole process activity together in field education that includes planning , organizing , directing , reporting , coordinating , monitoring and evaluating with use means available infrastructure Good personnel , materials and spiritual for reach objective education in a manner effective etc efficient . kindly special in context education , Djam'an Satori in Ambarita (2013:18) provides understanding management education with use term administration meaning education as " the whole process of cooperation with utilise all source available and appropriate personnel and materials For reach objective education that has set in a manner effective and efficient .

Management in called Arabic Idrah . Idara taken originate from the word addauran . Part observer in a manner term mean it as tool For realize objective general. That idara (management) is something related activity leadership , directing , personal development , planning and supervision to related work with elements tree in something project . (2020:119)

A. Implementation Management Curriculum and Learning

Management curriculum and learning in management based on function POAC management (Planning, Organizing, Actuating, and Controlling). The curriculum used at SMP Muhammadiyah-06 Belawan is curriculum independent . Before the bell rings beeps , there is students who get timetable sweep , there students playing and chatting and others outside class . After the bell goes beeps student with fast and orderly line up front class each For do routine habituation done with accompanied by a guardian class each.

Function POAC management which includes : 1) Planning (planning) includes , designing established curriculum and curricula as well as the learning model used so that can produce good output and support education at SMP Muhammadiyah-06 Belawan . 2) Organizing (organizing) includes determination program structure and content _ whole class use curriculum independent . 3) Actuating namely is activity the preparation of the RPP is carried out after results evaluation and ahead teachings new , and 4) Supervision (controlling) the necessary supervision process implemented for members organization can cooperate with well , and the movement is the same to direction achievement goals and objectives general organization . Supervision done For measure results work, use avoid deviations, and if needed quick do decisive action _ to various deviations that occur . (2021:172) performed by the Head School to implementation planning curriculum and implementation learning that includes document device and implementation included classroom learning _ _ evaluation results learn .

B. Implementation Management Participant educate

SMP Muhammadiyah-06 Belawan carrying out the acceptance process student starting in month November before beginning teachings just started . Usually on the moon December or month January of the year Next , registration Already closed . this because quota reception student new very limited . Acceptance process students at SMP Muhammadiyah-06 Belawan is through Administration which is assisted by teachers on an ongoing basis alternating and scheduled . A number of mandatory requirements filled by candidates student new For Can registering at SMP Muhammadiyah-06 Belawan , are : filling out form registration , submission photocopy deed birth candidate students , photocopy KTP & KK of parents and submit a passport photo latest size 4x6.

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At that time determined , candidate student new enter enough stages _ important , ie take a competency test . Competency test material This is reading , writing and arithmetic . Objective carrying out a competency test This is for school know ability his students . this important for development ability child after enter school can is known in a manner measurable , so evaluation can done in a manner thorough . Teacher of course just own very role _ big to success learning at school . Interests , abilities and potential possessed by participants educate No will develop optimally without _ help and motivation from the teacher. In the learning process teaching , teachers are required have broad and capable become the facilitator on duty give convenience in Study to whole participant educate them Can Study in pleasant atmosphere , happiness , full _ passionate and brave put forward his opinion in a manner open .

Teachers should too creative in designing material learning , resources learn and use interesting media . Implementation management participant educate started of : 1) Planning (planning), ie requirements necessary administration fulfilled candidate student new , incl condition age that has enough , 2) Organizing (organizing) namely the acceptance process student new carried out by administrative staff and assisted by teachers alternating and scheduled , 3) Actuating namely build discipline student in comply with the rules and maintain environment school , 4) Supervision (controlling), ie supervision to discipline student Good in matter level presence nor other habits that have been determined by the school .

C. Implementation Management Educators and Education Personnel

1. Qualifications of Educators Educators (teachers) are source Power very human important in A institution education . this because , they is a related front-liner direct with student so that succeed or nope student lies within a teacher in the learning process . Recruitment and coaching process to power educator is something quite vital . In matter teacher recruitment of course just No only consider side academic her , however There is other mandatory requirements fulfilled that is they must own good personality , integrity and have characteristic not quite enough answer to something he carries .
2. Attempt Enhancement Ability of Educators . Effort enhancement ability teacher at SMP Muhammadiyah-06 Belawan among other things done through training , workshops, seminars nor system another education . Good cooperation _ with between fellow teachers and with parents / guardians of students very much needed , so intertwined connection harmonious family . _

D. Implementation Management Means Infrastructure

1. Availability Facilities and Infrastructure. Facilities and infrastructure is one factor support in achievement success of the learning process teach at school. it can achieved when availability adequate facilities and infrastructure accompanied with optimal management. SMP Muhammadiyah-06 Belawan in a manner gradually try complete means infrastructure education is in good in a manner physique nor non- physical in increase the efficiency of the learning process .
2. Conformity Means Infrastructure suitability means infrastructure learning at SMP Muhammadiyah-06 Belawan Still must fixed . Obstacles faced in procurement of infrastructure suggestions that is budget from still foundation limited , so needed scale priority in complete it .

Implementation Management Financing

Governance management finance at SMP Muhammadiyah-06 Belawan done with ok . this because involve those who have skills and experience so that system accountability finance Can done with good , effective and efficient . Supervision implementation budget done Good in a manner periodic nor in a manner incidental by the foundation . Function Management start from : 1). Planning (planning), that is planning budget For necessity operational school . 2). Organizing (organizing), ie drafting budget shopping involving school Head Schools , Teacher Councils, Administration and Committees . 3). Implementation (actuating), ie form maintenance bookkeeping in a manner orderly and able be held accountable. 4). Supervision (controlling), ie report results implementation budget and create report moment closing cash book periodic

4. CONCLUSION

Based on formula problem and result study about Implementation management education can _ taken conclusion as the following, Curriculum Education and Learning Management The learning process at SMP Muhammadiyah-06 Belawan , namely : 1) Implementation process learning Already arranged in the RPP as explanation from standard content , standard competency and competency basic , yearly and semester programs. 2) Use of learning media customized with the material being taught . 3) Parties school support efforts made by the teacher to explore and innovate so that learning become more good , 4) Assessment to student done through attitude and how much Far mastery and achievement objective learning achieved by students . With thereby implementation curriculum and learning at SMP Muhammadiyah-06 Belawan Already in accordance with hope .

Management Participant educate School as institution education Already do with Good start from the registration process serving , guiding and directing participant he taught . Management participant educate hold role

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important To use support the educational process at school . Management Educators and Education Personnel Management educators and staff education hold role important For support the educational process at SMP Muhammadiyah-06 Belawan . Management educators and staff education load qualification educators and staff education so that own good quality and have _ duties and responsibilities answer full in educate child he taught .

Management Facilities and Infrastructure Management facilities and infrastructure hold role important support the educational process at SMP Muhammadiyah-06 Belawan . Management facilities and infrastructure held based on on suitability need and availability own budget school . Availability facilities and infrastructure learning at SMP Muhammadiyah-06 Belawan Already adequate although Still something is necessary equipped .

Management Financing Management financing at SMP Muhammadiyah-06 Belawan held in a manner well and it worked use . Management financing This must done with Good remember limited funds and needs must school done according to scale priority in a manner erective and efficient. System good finances possible For finance program implementation efficient and most importantly is minimize happening abuse budget .

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