

Application of Fishbone Diagrams in Analyzing Resource and Learning Problems to Improve the Quality of Student Learning

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Abstrak: Mutu belajar siswa merupakan hal yang perlu diperhatikan oleh institusi pendidikan, karena utamanya kegiatan sekolah adalah proses belajar mengajar. Siswa dituntut untuk belajar yang dapat menambah pengetahuan, meningkatkan keterampilan, memperbaiki perilaku, sikap, dan mengokohkan kepribadian. Oleh karena itu peran guru BK sangat penting dalam mengarahkan dan membantu siswa dalam membuat keputusan dalam mengatasi problem mereka. Tujuan penelitian ini adalah untuk perbaikan mutu belajar siswa. Metode penelitian yang dilakukan yaitu penelitian kualitatif ini merujuk pada tinjauan literatur dan kepustakaan. Teknik analisis data menggunakan analisis diagram *fishbone*. Hasil penelitian ini menunjukkan dengan penggunaan diagram *fishbone* terdapat beberapa aspek yang menyebabkan terjadinya akar permasalahan rendahnya mutu belajar siswa antara lain aspek *man*, *method*, *tools*, dan *materials*. Setelah itu dirumuskan strategi yang dapat dijadikan solusi dalam masing-masing aspek. Adanya penerapan Diagram *Fishbone* diharapkan dapat membantu guru BK dalam perbaikan mutu belajar siswa untuk meminimalisir problem belajar sehingga peningkatan mutu belajar siswa di SMAN 3 Pasuruan dapat tercapai.

Kata Kunci: Diagram *Fishbone*; Analisa Problem; Perbaikan Mutu Belajar Siswa

Abstract: The quality of student learning is a matter that needs to be considered by educational institutions, because the main activity of schools is the teaching and learning process. Students are required to learn in a way that can increase knowledge, improve skills, improve behavior, attitudes, and strengthen personality. Therefore, the role of guidance and counseling teachers is very important in guiding and assisting students in making decisions in overcoming their problems. The purpose of this study is to improve the quality of student learning. The research method used is qualitative research, which refers to a literature review and bibliography. The data analysis technique uses a fishbone diagram analysis. The results of this study indicate that by using a fishbone diagram, there are several aspects that cause the root cause of the low quality of student learning, including aspects of man, method, tools, and materials. After that, strategies are formulated that can be used as solutions in each aspect. The application of the Fishbone Diagram is expected to assist guidance and counseling teachers in improving the quality of student learning to minimize learning problems so that an increase in the quality of student learning at SMAN 3 Pasuruan can be achieved.

Keywords: Fishbone Diagram; Problem Analysis; Improving Student Learning Quality

INTRODUCTION

When students make decisions, they are sometimes accompanied by feelings of doubt, stress and intimacy. for example, how the student can pass through the next stages of career development. If not handled well, it will become a problem (Suprianto & Jahada, 2023). Problems will become things that make it difficult to exist if they are

not resolved and a solution is sought, which can cause losses for the owner (Fitri & Marjohan, 2016). Therefore, Counselor are very important in their role in directing and helping students in making decisions in overcoming their problems so that students do not feel like they have taken a wrong step (Pratama, 2022).

In an educational institution or school, the strategy for implementing Total Quality Management (TQM) is termed the service industry, which plays a role in providing services according to customer expectations. Customers here can be interpreted as students (Pachlan, 2019). The school itself has the aim of being able to educate the life of the nation by developing people of faith, character and knowledge through educated students, so that students can have a strong education and good personality if the goal is achieved (Suryatmojo & Fitriyani, 2023). In educational institutions, it is necessary to know whether their activities have achieved the targets and vision and mission of the organization or not, so that institutions are required to develop their potential, so that support from all institutional members is needed to achieve goals, including in dealing with students as institutional customers. (Fitriyani & Dewi, 2024).

The main school activity is the teaching and learning process. Students are required to learn things that can increase knowledge, improve skills, improve behavior, attitudes and strengthen personality. Meanwhile, teachers are required to teach and provide knowledge to students in the form of both soft skills and hard skills. However, the problem that occurs is that many students have problems both internally and externally, thus disrupting the learning process (Adawiyah, 2021). Internal student problems at school include lack of motivation to learn, lack of discipline, low emotional intelligence, being too aggressive at school, learning boredom and so on. while external problems include, there is no money to pay tuition fees, the impact of parents' divorce, breakup and so on. This can be more of a concern for teachers, especially in the field of guidance and counseling, so that it can help alleviate and help find solutions to student problems (Yulianti et al., 2023).

SMAN 3 Pasuruan is one of the state schools in Pasuruan which still has problems in students learning from each other. This is because there are still many problematic students registered in the guidance and counseling room. The initial interview conducted with the Counselor Coordinator, Muhamad Ibnu Hakim, S.Pd explained that most of the students' problems at SMAN 3 Pasuruan fell into 3 categories, mild problems namely not being disciplined and not doing their assignments, moderate problems categorized as skipping school, and problems Severity given by brawls, drugs and smoking. To increase student mutual learning, handling and strategies can be used to minimize these problems. According to (Safrotulloh & Gumindari, 2021) that the fishbone diagram and the Kaizen concept can be a solution, because they have been assessed by many managers of educational institutions in solving student problems.

Fishbone diagrams can help guidance and counseling teachers in analyzing the causes of student problems both internally and externally to increase student motivation in learning, thereby improving the quality of student learning (Ariyani & Prima, 2019). Apart from the fishbone diagram, the Kaizen concept can also support mutual improvement in student learning, because it prioritizes improvements both periodically and continuously, so it is very effective when applied in the school environment (Roofi'i et al., 2022).



The urgency of this research is based on the still high number of problematic students who have a direct impact on the low quality of student learning at SMAN 3 Pasuruan, both caused by internal and external factors of the students. Without a comprehensive analysis of the root causes, the handling of learning problems tends to be partial and unsustainable. Therefore, the application of the fishbone diagram is important as an analytical tool that can map the causes of the problem systematically and comprehensively. This research is urgent because it not only functions as an academic study, but also as a basis for decision-making and the formulation of effective strategies to improve the quality of learning, so that it can support the achievement of school education goals and the continuous improvement of the quality of student learning.

The purpose of this study is to analyze in depth the root causes of resources and learning processes that cause the low quality of student learning at SMAN 3 Pasuruan using a fishbone diagram approach. Specifically, this study aims to identify the factors causing student learning problems, including human aspects (man), methods (method), facilities and infrastructure (tools), and learning materials (materials), and to develop systematic and applicable improvement strategies to enhance collaborative learning. In addition, this study also aims to provide practical contributions for guidance and counseling (BK) teachers and schools in designing interventions and policies based on sustainable root cause analysis.

Based on the presentation both empirically and theoretically, the researcher wants to research the Application of Fishbone Diagrams in Analyzing Problems and Improving the Quality of Student Learning, so that it is hoped that it can help Counselor in minimizing student learning problems, supporting mutual improvement of student learning, thereby improving the quality of student learning at SMAN 3 Pasuruan can be achieved.

LITERATURE REVIEW

Problem Analysis

Problem analysis is a systematic process for finding the underlying causes (roots) of a problem, not just the visible symptoms. In the context of educational and organizational research, root cause analysis (RCA) is an approach used to understand the factors that trigger the emergence of the problem so that appropriate solutions can be formulated. This type of analysis is considered more effective for long-term improvement than simply addressing the symptoms of the problem. The RCA approach requires clear problem resolution, identification of causal factors, and systematic evaluation of cause-and-effect relationships (Ma et al., 2021).

Problem analysis is a collective process over time to transform initial symptoms into a set of problem formulations that are clear and comprehensive enough to seek solutions (Baer et al., 2013). Problem analysis also focuses on sales issues, meaning how middle-level managers raise a problem or issue to top management. Therefore, problem analysis is understood as a socio-political process, namely how the problem is packaged to attract attention, who is invited to coordinate (involvement movement), and the selection of appropriate channels and timing (Dutton et al., 2001).



Fishbone Analysis

A fishbone diagram is a tool that helps teams analyze the root causes of quality problems (e.g., poor performance or student misbehavior), allowing them to focus on the root cause (Barsalou et al., 2024). Fishbone diagrams also contain hypotheses about the causes of failure because they develop a matrix to prioritize causal hypotheses within the diagram based on their relationship to the problem and their associated costs and efforts (Fitriyani et al., 2025). Fishbone diagrams are a technique for mapping all factors that contribute to a problem to a desired outcome and are used to improve the quality of education (Suhendi & Madhakomala, 2023). The function of fishbone diagrams in schools is to facilitate Fishbone mapping the causes of student problems (e.g., aggressive behavior, dropout, and low motivation), help school teams separate symptoms from root causes, and design counseling interventions based on causal factors at the individual, family, and school system levels (Slameto, 2016).

Role of Counselor

School counselors are professionals (usually with a background in counseling or psychology) who are responsible for designing and implementing comprehensive guidance and counseling programs to support students' academic, social-emotional, and career development through prevention, intervention, advocacy, and collaboration services with various parties (Carey, 2020). Some of the roles that counselors need to fulfill in schools include: first, the development role, where counselors can build systematic guidance programs to strengthen the learning, social, and career skills of all students. Second, the prevention role, where counselors need to identify risks (dropping out of school, bullying, depression, contributing to substance use) and develop prevention programs at the school level. Third, the intervention role, where counselors can provide individual and group counseling, manage cases, and make referrals to other professional services when needed (Steen & Melfie, 2021). Fourth, the advocacy role, where counselors can use data to advocate for more inclusive and responsive school policies to students' needs, becoming a voice for vulnerable and marginalized students. Fifth, the consultative and collaborative role, where counselors can work with teachers, parents, principals, and the community to provide consultation and training (e.g., how to handle traumatized students) (Perryman et al., 2025).

METHOD

This research was carried out in March 2024 at SMAN 3 Pasuruan which is located on Jalan Slamet Riyadi No. 144 Seban Village, Gadingrejo District, Pasuruan City. The research respondents were all school residents consisting of the Principal, teachers, students and staff of SMAN 3 Pasuruan. The research method used is qualitative research, which uses descriptive data in the form of written and spoken language obtained from observations. This qualitative research was conducted to explain and analyze the phenomenon of events, social dynamics, perceptions, attitudes and beliefs, so that qualitative research begins with the development of fundamental assumptions (Sakdiyah et al., 2022). Apart from that, this qualitative research draws on literature and literature reviews to examine the theories used (Yusuf et al., 2022).

Data collection instruments in this study include observation, interviews, and documentation studies, each equipped with indicators. The observation instrument was



used to directly observe the learning process in the classroom with indicators including the availability and utilization of learning facilities and infrastructure, teacher teaching methods, student engagement and motivation, and the condition of the learning environment. The interview instrument was conducted semi-structured with the principal, teachers, and students with indicators including perceptions of learning barriers, factors causing learning problems (human, methods, media, environment, and management) analyzed using a fishbone diagram, as well as improvement efforts that have been or will be carried out. Meanwhile, the documentation study instrument was used to review supporting data with indicators in the form of student learning outcomes, attendance lists, learning tools, and relevant school policy documents, to strengthen the findings of observations and interviews in analyzing the root of the problem and developing strategies to improve the quality of learning (Anas et al., 2025).

The data analysis technique in this study was conducted descriptively qualitatively with several interrelated stages. Data obtained through observation, interviews, and documentation studies were first analyzed through data reduction, namely selecting, focusing, and connecting data relevant to the complexity of resources and learning processes. Next, the data were presented in the form of narratives, matrices, and fishbone charts (cause-and-effect diagrams) to group the factors causing learning problems into the categories of humans (man), methods (method), infrastructure (machine/media), environment (environment), and management (management). The final stage is conclusion and verification, namely interpreting the pattern of relationships between causes to determine the root of the problem and outlining appropriate improvement strategies in order to improve the quality of student learning, by ensuring the validity of the data through triangulation of sources and techniques (Baali et al., 2023).

RESULT AND DISCUSSION

Problem Analysis

This research conducted a problem analysis to gain a deeper understanding of the causes of learning problems, including factors such as teachers, methods, facilities, the environment, and policies. Furthermore, it can enable researchers and education policy stakeholders to systematically explore cause-and-effect relationships, thereby making the formulated intervention programs more effective (Ma et al., 2021). The results of research at SMAN 3 Pasuruan show that data on the number of students with problems during 2024 can be seen in the table below,

Table 1. Number of Problematic Students

Month	Number of Problematic Students	Class X	Class XI	Class XII	Information
January	23	6	10	7	A, B, C, D
February	17	3	14	0	A, B, C, D
March	19	5	12	2	A, B, C, D, E
April	22	4	15	3	A, B, C, D
May	31	8	23	0	A, B, C, D, F
June	-	0	0	0	School holidays



July	-	0	0	0	Beginning of the New School Year
August	12	3	8	1	A, B, C, D
September	23	6	15	2	A, B, C, D
October	20	5	15	0	A, B, C, D
November	16	2	13	1	A, B, C, D, F
December	16	3	10	3	A, B, C, D
Total	199	45 (22,6%)	135 (67,8%)	19 (9,5%)	

Information :

- A. Not Disciplined
- B. Not Doing Assignments
- C. Not Taking Certain Classes
- D. Not Attending School
- E. Smoking
- F. Brawl

From Table 1, it can be seen that during 2024 the number of problematic students will be 199 people consisting of 22.6% from class X, 67.8% from class XI, and 9.5% from class XII. Therefore, it is necessary for the school to use a disciplined approach and Counselor approach in dealing with this problem. As stated by (Mazrur, 2022) that efforts to deal with problematic students are with a disciplinary approach, meaning referring to the rules and regulations (rules and regulations) that apply at school and their sanctions, as well as the approach of Counselor who prioritize guidance and counseling services.

Problems that occur with students result in the low quality of student learning, so it needs to be explored further to find out the roots and causes of problems, so that fishbone is the right method for categorizing the causes of problems. According to (Safrotulloh & Gumindari, 2021) that the fishbone diagram can be used to identify and organize the causes and impacts of problems, so that the root of the problem can be eliminated and several problems that arise can be mentioned.

Fishbone Analysis

The results of the analysis in determining the roots and causes of the low quality of student learning can be seen in Figure 1 below,

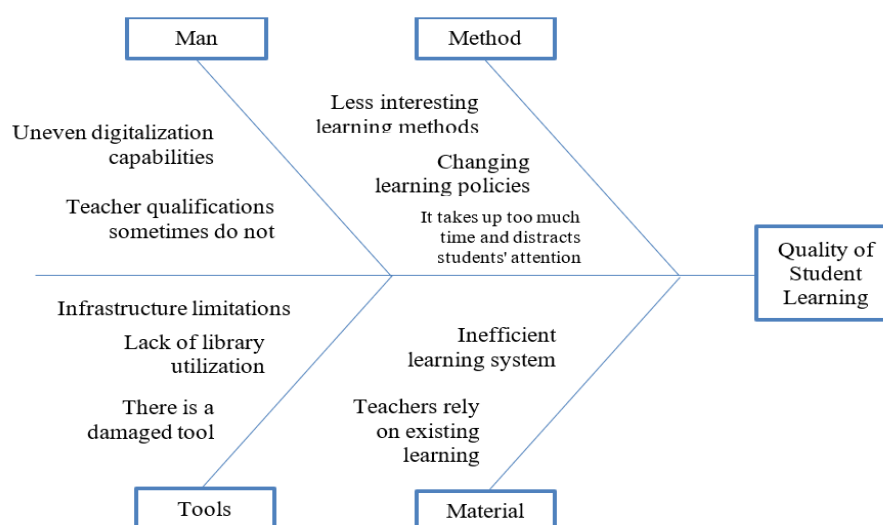


Figure 1. Fishbone Diagrams

In analyzing the Fishbone diagram as in Figure 1, researchers involve several aspects that cause the low quality of student learning, such as people, methods, materials and tools. In the Man aspect, it can be explained the human resources involved in causing the low quality of student learning. In the fishbone diagram, it can be seen that the problem from the human side is that digitalization capabilities are not evenly distributed, meaning that not all teachers have IT skills in teaching, especially senior teachers, even though each class has supporting infrastructure such as LCDs and projectors. Apart from that, teacher qualifications which sometimes do not match class needs are also a problem, so teachers are transferred to other subjects. This can result in students' learning becoming low, so that students become bored and less enthusiastic about learning. As stated by (Adha et al., 2019) that the ability to teach, especially in digital media, is important for teachers to have, so that the teaching and learning system becomes interesting. Apart from that, the teacher's qualifications in exploration are also important to pay attention to, because if the teacher meets the required qualifications and has interesting learning media, it can increase students' interest in learning. (Pratiwi et al., 2023) adding that the human aspect can be measured by whether it can support the agency's objectives legally and not violate the law, so that the expected final results can be achieved.

In the Method aspect, problems can be seen regarding learning methods that are less interesting, sometimes teachers only provide material that is repetitive and does not adapt to developments, for example the example questions given are from 2005. So it is important to update learning methods. The problem with the second method is that learning policies have changed, such as from the 2013 curriculum to an independent curriculum, then changed again to a curriculum that recognizes past learning, so that many teachers are reluctant to learn in new method changes, but teachers are required to update learning to adapt to changes in the curriculum. The third problem is that learning takes too much time, so it can distract students' attention. According to (Risikiyana et al., 2021) that there is a need for varied learning methods according to students' needs. Apart from that, school principals should not just watch this matter silently, but must also be able to develop strategies to deal with problems, because if they are not addressed, it can cause the students' learning process to be lower.

In the aspect of Tools or infrastructure, it can be seen that the problem that occurs is limited infrastructure, such as using classrooms that only use room temperature because there is no air conditioning or fan, resulting in the dry season, the class will feel hot so that students often leave the classroom. Apart from that, there is also a problem of students' lack of use of the library because students prefer playing on their cellphones rather than going to the library to do assignments. Damaged teaching aids in the laboratory must also be repaired immediately to support improving the quality of student learning. As stated (Adha et al., 2019) that the facilities and infrastructure of the educational process must be considered in achieving improvements in the quality of student learning.

In the material aspect, it can be seen that the problem that occurs is the inefficiency of the learning system, this is because many teachers when in class like to tell stories, so the core material is often not conveyed, besides that many teachers still rely on existing teaching materials so that learning seems monotonous and less attractive. As stated by (Sukmana et al., 2023) that teachers must realize that students have diverse characters, so teachers are required to be able to provide open materials



and learning media that are interesting and appropriate to students' needs in order to improve students' mutual learning.

Strategies for Improving Student Learning Quality

From the description of the problems depicted in the fishbone diagram at SMAN 3 Pasuruan, a strategy was developed to improve the quality of student learning which can be seen in table 2 below.

Table 2. Strategies for Improving Student Learning Quality

No.	Fishbone Aspect Diagram	Problem	Strategy
1	Man	<ul style="list-style-type: none"> • Uneven digitalization capabilities • Teacher placement qualifications sometimes do not match class needs 	<ul style="list-style-type: none"> • Providing digitalization training guided by resource persons who are experts in the IT field • Submission and procurement of teacher recruitment according to class needs
2	Method	<ul style="list-style-type: none"> • Less interesting learning methods • Changing learning policies • Takes too much time and distracts students' attention 	<ul style="list-style-type: none"> • Providing training to develop varied learning methods • Preparation of a quality and innovative learning curriculum team • Regular development of teacher competency
3	Tools	<ul style="list-style-type: none"> • Limited infrastructure • Lack of library utilization • There is a damaged tool 	<ul style="list-style-type: none"> • Maximizing the use of infrastructure • Advice on library use • Repair damaged equipment
4	Material	<ul style="list-style-type: none"> • Inefficient learning system • Teachers rely on existing learning resources 	<ul style="list-style-type: none"> • Provide training in making open books and using learning media • Carry out regular monitoring and evaluation

From Table 2, it can be seen that the results of observations regarding strategies for improving student learning can be broken down into 4 aspects, namely people, methods, tools and materials.

The strategy carried out in the Man aspect is that digitalization training can be carried out guided by resource persons who are experts in the field of IT and the procurement of teacher recruitment according to class needs, so that the Principal of SMAN 3 Pasuruan must support efforts to improve teacher quality so that teacher abilities in the digital world are even and teacher qualifications can be achieved. In line with the statement (Zaki et al., 2024) that teachers need to increase their knowledge in the use of information technology so as not to be left behind with developments in learning in the digital era (Ardiyanto et al., 2023) Adding that the digital era 4.0 is encouraging the development of the world of education today, one of which is using artificial intelligence which can influence analytical and systematic thinking skills for teachers (Sudirjo et al., 2023) also explained that improving the quality of learning can be done if it is supported by qualified resources, for example teachers who meet needs, are creative and have innovations in teaching.

The strategy carried out in the Method aspect is training in developing varied learning methods, organizing quality and innovative learning curriculum times, and developing teacher competency on a regular basis. This was done because of the importance of mastering learning methods for teachers at SMAN 3 Pasuruan in order to accommodate students' needs, so the importance of support from the Principal in



developing teacher competency. In line with what was stated by (Kinanti et al., 2024) that school principals need to provide support so that teachers develop their competence in creating interesting things for students in the era of digitalization, so that teachers can innovate in utilizing technology (Baali et al., 2023) Adding that teachers need to take part in education and training, technical guidance or courses both internally and externally so that competence and quality of resources can increase, so as to create an atmosphere where students do not feel bored in class.

The strategy used in the Tools aspect is maximizing the use of infrastructure, encouraging library use, and repairing damaged equipment. This is done so that both teachers and students of SMAN 3 Pasuruan can develop their knowledge, and the learning atmosphere becomes more enjoyable with the facilities and infrastructure that support learning. Senate with a statement (Sari et al., 2024) that the use and maintenance of school facilities and infrastructure is important so that it has a positive impact on the quality of teaching for students, so that the quality of student learning can improve. (Suranto et al., 2022) adding that one of the things in improving the quality of student learning is planning, procuring, using, inventorying, maintaining and eliminating school facilities and infrastructure, because it can help the teaching and learning process run smoothly and get the desired results.

The strategies implemented in the material aspect include training in making textbooks and using learning media as well as carrying out regular monitoring and evaluation. This is done so that the material presented by the teacher to students can be explained completely. According to (Setiawati, 2022) that curriculum changes need to be made according to current developments. In supporting curriculum changes, the material presented should also adapt to the new curriculum, including the use of learning media which must also be supported. (Mayasari et al., 2021) adding that teachers are required to think creatively and innovatively in preparing learning media, for example by creating audio-visual materials to increase student learning activity, the impact of which can also improve the quality of student learning. (Pamungkas et al., 2024) also explained that there is a need for support from the school principal to encourage students in learning who dare to explore, experiment, and not be afraid of failure in the learning process, so that students can focus more on learning and can minimize problems for students.

The Role of Counselor

Counselor have an important role in bridging the problems of students and teachers in the teaching and learning process, so that they provide services and accommodate students who have obstacles in learning. Obstacles that often confront students at SMAN 3 Pasuruan are lack of discipline, not doing assignments, not taking part in certain subjects, and not going to school. If this continues, it will become toxic to other students. Problems experienced by students are conveyed in school evaluation meetings every semester conducted by the principal and teachers so that improvements in the quality of student learning can be achieved.

The things that Counselor do in dealing with problematic students include (Putra, 2015),

- a. Preventive action, where this activity is carried out to prevent juvenile delinquency, for example Counselor provide training in class to strengthen students' mentality so that they can solve problems that face them as seen in Figure 2 below,





Figure 2. Problem Solving Coaching

In Figure 2, you can see the enthusiasm of students in participating in the training conducted by the Counselor. The training is carried out in rotation from classes X, XI, and XII in classrooms to prevent delinquency by students.

- b. Repressive action, where punishment is given to students. Counselor can monitor students by calling them to the guidance and counseling room at school, or making home visits at students' homes as seen in pictures 3 and 4 below.



Figure 3. Monitor Students In the Guidance and Counseling Room



Figure 4. Monitor Students at Home

In Figure 3, it can be seen that the Counselor provides guidance regarding problems that students have experienced, and these problems are minor violations that students have committed. Meanwhile, in Figure 4, it can be seen that the Counselor carries out monitoring at home, meaning that the violations committed by students are classified as moderate violations.

- c. Curative Action, where the Counselor calls students for a case conference or case transfer as seen in Figure 5 below,



Figure 5. Confirming Cases

In Figure 5, it can be seen that the Counselor confirmed the case that the student had committed. At this stage, violations committed by students are classified as serious. Like the brawl cases that occurred in May and November 2024.

CONCLUSION

From the research results, it can be concluded that by using a fishbone diagram there are several aspects that cause the root of the problem of low student mutual learning, including other aspects of humans, methods, tools and materials. The strategy carried out on the human aspect is holding digitalization training guided by resource persons who are experts in the IT field and providing teacher recruitment according to class needs. In the strategic method aspect carried out, namely training in developing varied learning methods, preparing quality and innovative learning curriculum times, and developing teacher competency on a regular basis. In the aspect of strategic tools carried out is maximizing the use of infrastructure, appeals for library use. In the material aspect of the strategy carried out is training in making open books and using learning media as well as carrying out regular monitoring and evaluation. This is done in order to make improvements together with student learning, so that the school's vision, mission and goals can be achieved.

Suggestions that can be given in this research are for the Principal of schoolt SMAN 3 Pasuruan to be able to develop innovative and varied learning methods using information technology learning media, for the Counselor at school school will look for motivation to study if they get subjects they are less interested in, and for future researchers they will look for other strategies in solving problems that occur at school, for example, uses the Kaizen strategy to revitalize the school's mutual culture.

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