

## **TIRTA: Coaching Academic Supervision of Mathematics Teacher Performance**

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### **Abstract**

This research aims to find out the problems of mathematics teachers, help teachers find new formulas for learning, and evaluate the implementation of academic supervision coaching in improving the performance of mathematics teachers. This type of research uses descriptive qualitative with a case study research design in academic supervision coaching TIRTA Flow (Goals, Identification, Action Plan, Responsibilities). Research subjects included mathematics teachers from grades VII-IX. The research location is UPT SMPN 2 Pringsewu. Data collection through interviews, observation and documentation. The data analysis procedure is data reduction, data presentation and drawing conclusions. The implementation of coaching in academic supervision includes several stages, namely the pre-observation stage; learning objectives, development areas to be achieved, and strategies prepared. Observation stage; observation I (comfortable learning environment, positive communication, application of discipline, providing motivation), observation II (opening, social emotional content, approach, learning strategies, closing), observation III (giving feedback and carrying out assessments), post-observation stage; reflection, follow-up plans, and self-development plans; Data was obtained from 4 teachers whose initial category was moderate to good, from 70% to 80%, so it can be concluded that coaching in academic supervision can improve the performance of mathematics teachers..

**Keywords:** Teacher Performance, coaching, academic supervision

### **Introduction**

Improving the quality of mathematics learning in schools requires an important role from teachers in creating a conducive and effective learning



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environment Arikunto (2006). One way to improve teacher competence is through academic supervision that can help teachers identify problems, formulate solutions, and improve their performance in the classroom (Mulyasa.E, 2013). On the other hand, Robbins, S. P., & Judge, T. A. (2013) said that the implementation of academic supervision is a coaching activity planned to help teachers and other school employees carry out their duties effectively. In this case, it is clear that the main element of the implementation of supervision is the coaching carried out by the principal to all teachers in the school he leads. Coaching in academic supervision is one method that is considered effective in improving teacher skills and professionalism (Sergiovanni, T. J., & Starratt, R. J.: 2007). Academic supervision coaching aims to provide support to teachers in various aspects of learning, from the preparation of clear learning objectives to the implementation of appropriate learning strategies. One model that can be applied in academic supervision coaching is the TIRTA Flow (Objective, Identification, Action plan, Responsibility), which involves a series of stages starting from pre-observation to post-observation to conduct evaluation and follow-up planning.

On the other hand, mathematics teachers often face challenges in terms of delivering complex materials, as well as difficulties in designing learning strategies that can attract attention and improve student understanding. With the existence of academic supervision coaching, it is expected to help teachers identify the problems they face, find more effective learning formulas, and improve the quality of teaching which in turn has an impact on improving student performance.

This study focuses on the evaluation of the implementation of academic supervision coaching in improving the performance of mathematics teachers at UPT SMPN 2 Pringsewu. It is hoped that the results of this study can contribute to improving mathematics learning and provide insight into the application of coaching in the context of education. The objectives of this study are to: Identify problems faced by mathematics teachers in learning; Help teachers find new formulas in mathematics learning; and evaluate the implementation of academic supervision coaching in improving the performance of mathematics teachers. Through this research, it is hoped that we can obtain an overview of the effectiveness of academic supervision coaching in supporting the improvement of teacher competence and performance, as well as providing input for the development of better teacher professional development programs in the future..

## Research Methods

The location of the research was carried out at UPT SMP Negeri 2 Pringsewu. The subjects of the study were all mathematics teachers at the school. Where the

number of mathematics teachers is 5 people. Most of the mathematics teachers live not far from the school environment so that they greatly support the activities of the teaching staff in carrying out their work well. After the subjects were determined, the academic supervision implementation schedule was carried out according to the TIRTA model flow, the research was conducted from July 2023 to September 2023. Data collection techniques were in the form of observation and documentation. Observation was used by researchers to obtain teacher performance assessment data during pre-observation, observation and post-observation. The data is to review the teacher's ability to manage learning in the classroom. Meanwhile, documentation is used to obtain research data in the form of teacher performance, teacher identity and the class they teach, various notes on the results of academic supervision from teachers in the previous year. The research instrument used was an observation sheet that refers to the four competencies possessed by teachers in classroom management. The rubric criteria used is a Likert scale with the choices Very Good (SB) score 4, Good (B) score 3, Less Good (KB) score 2, and Not Good Score 1. Analysis of observation sheet data was conducted to review teacher performance during pre-observation, observation and post-observation in learning. The formula used is:

$$PKG = \frac{a}{n} \times 100$$

**Description:**

**PKG** : Percentage of Teacher Performance (scale 100)

**A** : Number of scores obtained

**N** : Total score

Interpretation of the percentage of activeness criteria is presented in Table 1

**Table 1. Teacher Performance Criteria**

<b>Nilai (%)</b>	<b>Kriteria</b>
$90 \leq PKG \leq 100$	Very Good
$75 \leq PKG < 90$	Good
$60 \leq PKG < 75$	Enough
$50 \leq PKG < 60$	Medium
$PKG < 50$	Poor

Because the significance value is greater than 0.05, the data for both classes are normally distributed. The homogeneity test used in this study is the Levene statistical test. The homogeneity test is to show that the sample data comes from a population that has the same variance. Data is said to be homogeneous if the significance value is  $> 0.05$ .

Data analysis was conducted to review the magnitude of the increase (gain index) of individual teachers, the average and percentage of increase (gain index) classically so that the level of supervision assessment classification was obtained by reviewing the results of supervision in the previous year. The formula used for the effectiveness of individual teacher academic supervision coaching is:

$$< g > = \frac{SkorAfter\ Score - Before\ Score}{(Total\ Score - Before\ Score)}$$

Furthermore, the formula used to determine the average increase (gain index) in the effectiveness of classical teacher academic supervision coaching is as follows:

$$\bar{X} = \frac{B}{n} \times 100\%$$

Description

$\bar{X}$  = Average increase (gain index)

B = Number of increases (gain index) in teacher performance assessment

n = Number of teachers observed

The testing of the formulated hypothesis was analyzed using Two-Way Analysis of How to provide an interpretation of the effectiveness of teacher academic supervision coaching by making a percentage of the average increase (gain index) obtained with the previous formula. The results of the percentage of the average increase (gain index) of the effectiveness of teacher academic supervision coaching classically to provide meaning or significance to the values obtained for the specified criteria are presented in Table 2.

Table 2. Criteria for Effectiveness of Average Increase (Gain Index)

Average Increase (Gain Index) (%) Criteria	Criteria
76 – 100	Effective
56 – 75	Quite Effective
41 – 55	Less Effective
0 – 40	Not Effective

The results of the study on teacher performance during pre-observation, observation and post-observation in effective learning if the results of the analysis are obtained (1) the value obtained by determining the criteria for teacher performance during pre-observation, observation and post-observation in learning in the very good and good categories, (2) there is an increase in teacher performance during pre-observation, observation and post-observation in learning before and

after academic supervision coaching with the TIRTA model is carried out. The process steps taken with the TIRTA flow are as follows: stage T (Objective), stage I (Identification); stage R (Action Plan), stage TA (Responsibility).

Furthermore, data mining is carried out to accommodate the problems faced by teachers in academic supervision activities and to help teachers find new formulas related to student learning outcomes with the TIRTA model in improving teacher performance. Meanwhile, to obtain this data, data collection is carried out using interviews, field observations, and reviewing documents that support the research. Interviews are conducted by researchers in conducting academic supervision coaching using the TIRTA model based on observations made. Academic supervision coaching is carried out by providing questions in reviewing how the planning process is made in observation activities carried out in the classroom during learning

### Results and Discussions

After conducting observations in the classroom, it was then analyzed by reviewing the values obtained from each academic supervision coaching with the TIRTA model. The results of the data analysis obtained the following data:

**Table 3. Results of Teacher Performance Values and Categories**

No	Teacher Name Code	Sum		Categori
		Scor	Value	
1	SA	51	98,08	Very Good
2	SD	50	96,15	Very Good
3	AN	43	82,69	Good
4	BZ	41	78,85	Good
5	TR	50	96,15	Very Good
Average		47	90,38	
categories		Very good		

Based on Table 3., the scores for each aspect of the 5 teachers are as follows: (1) there are 3 teachers in the very good category; and (2) there are 2 teachers in the good category. In addition, the average achievement of teacher performance assessment during pre-observation, observation and post-observation aimed at reviewing teacher performance was obtained 90.38 with very good criteria. Furthermore, to review the effectiveness of academic supervision coaching with the TIRTA model in improving teacher performance, the results of the analysis of academic supervision data were compared with academic supervision data before academic supervision coaching was carried out with the TIRTA model. The results of teacher performance data before and after academic supervision coaching with the TIRTA model are presented in the following Table 4.

**Table 4.** Results of Teacher Performance Values

No	Kode Teacher	Before		After	
		Score	Value	Scor	Value
1	SA	40	76,92	51	98,08
2	SP	38	82,69	50	96,15
3	AN	30	57,69	43	82,69
4	BI	28	53,85	41	78,85

The data in Table 4. obtained that each teacher experienced an increase in score and value. Based on the existing data, the researcher then reviewed the effectiveness of academic supervision coaching with the TIRTA model in improving teacher performance with an analysis of the increase data (gain index) from individual teachers. The calculation results obtained that the average increase value (gain index) was 61.62% with fairly effective criteria. The next result is a presentation of data based on findings through interviews, observations and documentation conducted by the team to help carry out academic supervision and teachers as research subjects. The implementation of teacher performance supervision is carried out by interviewing by reviewing the results of observation activities in classroom learning based on learning observation instruments. Interviews are conducted with the TIRTA model academic supervision coaching instrument based on the results of performance values obtained based on quantitative calculations. This interview was conducted to review the results of observations that have been carried out in the classroom. Open interviews conducted by researchers in conducting academic supervision coaching with the TIRTA model are based on observations made. Academic supervision coaching is carried out by asking questions in reviewing how the planning process is made in observation activities carried out in the classroom during learning. The results of the first interview were about "what is the main purpose of the post-observation discussion? and is post-observation important to do?" Here is one excerpt from the interview results from stage T (Objectives) with one of the mathematics teachers.

*"The learning objectives carried out in class during observation, I feel that there is still a need for improvement in the quality of learning, especially visualizing concepts using learning media, I chose this to improve the learning process because I feel that when learning occurs, students still feel confused about carrying out the arithmetic operations carried out. I feel that the initial planning that I prepared has not provided convenience for students so this is important because it is hoped that my desire for students to be able to understand integer arithmetic operations well."*

The results of the interview at stage T, namely the purpose of academic supervision coaching with the TIRTA model conducted by the researcher on the

question "what is the main purpose of the post-observation discussion? and is post-observation important to do?", teachers are able to analyze what the problems are in the learning that has been done so that they are able to explain how the problems occur in the classroom and what they need to do to improve the next observation learning. Teachers are able to express what the problems are faced and find what is needed in alternatives for the expected goals.

The results of the second interview explore information related to "what is the ideal number you expect from the goals conveyed? and what factors make the situation ideal?" the following is an excerpt from the results of the interview stage I (Identification): "I feel that from 1 to 10, the ideal number desired is 8.5 with the factors that will be considered are student-centered learning with the motivation I do to make them focus on the learning media used"

The results of the interview at stage I, namely the identification of problem conditions from academic supervision coaching with the TIRTA model conducted by the researcher on the question "what is the ideal number you expect from the goals conveyed? and what factors make the situation ideal?", teachers are able to analyze the success they will achieve with the goals they do so that the problematic things they will face in the next observation process they are able to do according to the ideal targets they expect.

The results of the third interview, researchers tried to dig up information related to "What knowledge is relevant to the identification of the problem conditions obtained?; What are your new ideas so that the goals will be achieved? and try to sort out what you will do?" the following responses were obtained: "during college I once got a learning media course that at least had a fairer effect on the success of the learning process, besides that I have seen Mrs. Fitri Alhazizah using digital learning media according to current conditions. I will compile learning media that are in accordance with the interests of students by conducting initial observations, namely filling out a questionnaire on student needs in learning in the order of preparing devices, modules and making learning media according to the concepts that will be studied at the next meeting"

The results of the interview at the R stage, namely the action plan for academic supervision coaching with the TIRTA model carried out by researchers on the question "What knowledge is relevant to the identification of the problem conditions obtained?; What are your new ideas so that the goals will be achieved? and try to sort out what you will do?", the teacher is able to provide a flow of action plans that they will carry out in the next observation stage with the knowledge they have gained and the ideas that will be carried out according to the implementation that the teacher has obtained so that the action plan they have prepared can provide solutions that they found in the first observation. The results of the fourth interview, the researcher tried to dig up information related to "How will you carry

out the action plan that has been prepared?; What is the key to your success in carrying out the action plan?; and What is your commitment to implementing the action plan?" the following responses were obtained "I will carry out the action plan according to the planning in the second observation according to the teaching module that is designed according to the needs as planning material for the next observation. I try to appreciate the time given in learning, which is 3 x 40 minutes by paying attention to the condition of the learning media that can make students find the concepts they are studying. I try to continue to increase the enthusiasm for learning to improve the quality of learning that I will do in class, especially motivating students in learning with the achievement of the goals to be achieved"

The results of the interview at the TA stage, namely the responsibility of academic supervision coaching with the TIRTA model carried out by researchers regarding the questions "How will you carry out the action plan that has been prepared?; What is the key to your success in carrying out the action plan?; and What is your commitment to implementing the action plan? ", the teacher is able to explain in detail what the needs of students are during the learning process so that the teacher is able to commit to what the action plan is for the next observation without any coercion from the researcher as a supervisor in fixing the problems they face in learning during the first observation.

The results carried out by researchers during academic supervision coaching with the TIRTA model at the initial observation stage obtained the conclusion that teachers were able to accommodate the problems faced, help teachers find new formulas related to student learning outcomes in the next observation, and try to help improve teacher performance carried out at UPT SMP Negeri 2 Pringsewu without providing a solution to what should be done from the researcher, but teachers were able to analyze the conditions and situations they needed to do with a discussion of the academic supervision coaching instrument with the TIRTA model. Furthermore, in the implementation of observations 2 and 3, the results obtained were that teachers were able to carry out their important role in learning activities with planning that they were able to understand in the assessment of academic supervision.

In the Regulation of the Minister of National Education Number 13 of 2007 concerning School/Madrasah Principal Standards, it is explained that one of the duties of the principal is to carry out academic supervision which includes: (1) planning an academic supervision program in order to improve teacher professionalism; (2) carrying out academic supervision of teachers using the right approach and techniques; (3) following up on the results of academic supervision of teachers in order to improve teacher professionalism. Thus, the implementation of the academic supervision program by the principal is something that must be

considered in its implementation. The implementation of academic supervision by the principal at UPT SMP Negeri 2 Pringsewu has stages that are in accordance with the theoretical concept, namely starting from (1) academic supervision planning; (2) implementation of academic supervision; (3) analysis of academic supervision results; and (4) follow-up to academic supervision. In addition, the implementation of academic supervision at UPT SMP Negeri 2 Pringsewu has also been in accordance with the implementation of academic supervision made by the Ministry of Education and Culture. The flow of academic supervision implementation begins with academic supervision planning. Academic supervision planning aims to determine the objectives of supervision, then the supervision schedule, the supervision approach and techniques to be used, and the supervision instruments used. After carrying out supervision planning, it is then continued with the implementation of academic supervision in accordance with the planning that has been made previously. The supervision implementation process contains three activities, namely the implementation of supervision on learning devices, the implementation of supervision on the learning process, and the implementation of supervision on the assessment of learning outcomes. After the supervision implementation process is complete, the next step is to analyze the results of the supervision that have been obtained. The last process is to continue academic supervision as an effort to improve learning.

The results of the study showed that previously supervision at UPT SMP Negeri 2 Pringsewu had not been fully implemented according to plan. Especially the implementation of direct supervision, this was because there were several obstacles faced in realizing this, several obstacles in the implementation of supervision as follows: (1) Teacher readiness; (2) Implementation of RTL, the percentage of following up was not too much; (3) There was 1 senior teacher who was not used to conducting supervision using academic supervision coaching with the TIRTA model because he felt that digging information on the questions of the trigger became something that went round and round about what he wanted to solve; (4) Time, suddenly there was no preparation with the assumption of nervousness and lack of confidence when academic supervision was to be carried out. In addition, there was a change in the supervision schedule where teachers did not feel they were being supervised but rather mentored. Based on the results of the presentation obtained in the research findings above, then from several obstacles that have been described in the implementation of RTL that must be considered. Even though academic supervision has been carried out, either directly or indirectly, if there is no follow-up to the results of the supervision, then the implementation of academic supervision will be in vain. This is because there is no control from the supervisor to improve teacher performance through academic supervision. Based on observations and discussions with supervisors, mathematics

teachers at UPT SMP Negeri 2 Pringsewu are more familiar with the term mentoring than supervision. So sometimes teachers are not aware that they are being supervised by the principal, because the nature is more about sharing about the learning process in the classroom. One of the obstacles felt by teachers in implementing supervision is time. Planning for the implementation of supervision actually already exists, but because the adjustment of the schedule between teachers and the principal is still constrained so it has not been realized. Overcoming the obstacles faced in the implementation of supervision and the learning process, it is felt that there needs to be an effort to improve the performance of mathematics teachers, namely by providing direction that the task of a teacher is not only teaching in class, we as teachers also have an obligation to educate and direct children or students. Educating is if there is something bad it must be good (Sari, N., & Asmendri; 2023). Therefore, educating is not only about being smart but there must also be a change in behavior from children or students, so if there is no change in behavior it will be in vain, namely failing to educate children or students (Wahid Iqbal M., & Nurul Chayatin; 2009). From this explanation, researchers know that the task of a teacher is not only to teach in class, but has the responsibility to educate and direct students to make behavioral changes for the better.

In addition to the obstacles that were found in conducting the research. The success of this research is the answer to the proposed hypothesis, namely through academic supervision coaching with the TIRTA model, it can accommodate the problems faced by teachers in academic supervision activities, help teachers find new formulas related to student learning outcomes, improve teacher performance and be effective in improving teacher performance at UPT SMP Negeri 2 Pringsewu. In academic supervision carried out with the strategy of implementing academic supervision coaching with the TIRTA model at each stage of supervision, it turned out to have an effect on learning outcomes in the classroom. Teachers have done it according to the expected learning objectives. The teacher's potential is already visible in the process of assisting students and serving according to the needs of students. Learning has begun to focus on the readiness, talents and interests and learning styles of students. The application of coaching in supervision helps improve the potential and competence of teachers in the learning process in the classroom.

The thing that distinguishes coaching in supervision from previous supervision is in the post-observation stage. In the previous supervision, post-observation feedback was given without any reflection from the teacher himself. While in coaching in supervision, during post-observation, teacher reflection and follow-up were carried out, then the teacher planned further self-development. According to Wiryatmo, et al. (2021) said that academic supervision is professional

assistance to teachers, through a systematic planning cycle, careful observation, and objective and immediate feedback. In that way, teachers can use the feedback to pay attention to their performance. This opinion needs to be developed further that supervision is not limited to providing feedback but requires reflection and follow-up from the teacher himself (Supardi; 2014). Through reflection, teachers can identify strengths and weaknesses in their teaching (Octrina et al.: 2024). By knowing the areas where they excel and where they need to improve, teachers can take appropriate corrective actions to improve their performance. The increase in reflection results and improvements in the quality of teacher learning can be seen from the Education report which states that achievements have increased by 8.89 from 2023. In addition, teachers can feel supported and directed to continue to develop so that they can increase motivation and enthusiasm in working, which in turn will affect the overall performance of teachers (Nurartri Kurniasari et al; 2024). After the implementation of coaching in supervision, there was an increase in the quality of learning which was certainly accompanied by an increase in teacher performance as expected.

According to Mariani (2022), indicators of the principal's activities in following up on the findings of supervision results include: providing information, consultation and alternative solutions to problems found during supervision; discussing the results of supervision findings while providing coaching; while Karyati, R. (2020) Summarizing and reporting the results of supervision in general; Following up on the results of supervision for development and programs on an ongoing basis. Based on this theory, UPT SMP Negeri 2 Pringsewu has carried out the process of analyzing the results of academic supervision well and in accordance with the theory.

The results of academic supervision that have been carried out are used as a basis for consideration by the principal to provide motivation or training. From the results of academic supervision carried out, the principal always provides feedback to teachers to convey strengths, weaknesses, and improvements. The follow-up given to teachers includes training and motivation. The programs that have been given to teachers include workshops or training such as Adobe Flash and PowerPoint media training, administration workshops, and motivation in teaching. According to the Learning Materials Development Team of the Principal Development and Empowerment Institute (2011), the results of educational supervision need to be followed up in order to provide a real impact on improving teacher professionalism. In addition, the implementation of follow-up supervision activities as stated in the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 22 of 2016 concerning Process Standards include: (1) Strengthening and rewarding educators whose performance meets or exceeds standards; (2) Providing opportunities for educators to participate in ongoing

professional development programs. The implementation of follow-up academic supervision carried out at UPT SMP Negeri 2 Pringsewu, when viewed by paying attention to the theory, needs to provide reinforcement and rewards to teachers who have met the standards. Meanwhile, other follow-ups such as giving warnings and training have been carried out well.

### **Conclusion and Sugestion**

The results of the analysis conducted obtained the conclusion that: 1) Academic supervision coaching with the TIRTA model can accommodate the problems faced by mathematics teachers in academic supervision activities at UPT SMP Negeri 2 Pringsewu where teachers are able to find the problems faced when conducting observations in the classroom; 2) Academic supervision coaching with the TIRTA model can help teachers find new formulas related to student learning outcomes by applying ideas according to student needs; 3) Academic supervision coaching with the TIRTA model is able to improve teacher performance as shown by the existence of an action plan carried out according to needs as evidenced by increased student learning outcomes; 4) Academic supervision coaching with the TIRTA model improves teacher performance with an increase in the percentage of teacher performance from the previous year; 5) Academic supervision coaching with the TIRTA model is effective in improving teacher performance as shown by the analysis of data on the increase (gain index) from individual teachers of 61.62 with fairly effective criteria. Some suggestions that can be put forward from the results of research on the implementation of academic supervision coaching in improving teacher performance include: 1) Coaching training should be held so that principals and teachers are able to become good coaches so that they can help teachers or students in exploring their potential and solving problems faced; 2) Coaching activities in supervision can be developed through learning communities either through MKKS, MGMP, or KKG. 3) Driving teachers can be resource persons to provide materials on coaching.

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