TRAINING MANAGEMENT MODEL FOR TEACHERS FOR PHYSICAL OLYMPICS THROUGH APPLICATION OF LESSON STUDY IN MECHANICAL MATERIALS

[1]SARLOTASINGERIN, [2]ALTJE LATUNUNUWE, [3]ESTEVANUS HULISELAN

Pattimura University
E-mail: freona_mp@yahoo.co.id

Abstract - Learning is all the effort made by the teacher. Therefore the teacher must be able to memlah and choose and determine the learning approach that is in accordance with the learning material, characteristics of students in the learning process and learning objectives. The increasing ability of the Physics teacher in planning, implementing learning, can create a more interesting learning process, make students appear active and creative to explore to find concepts and improve the teaching skills of physics teachers such as mastery of material, use of learning media, classroom management, questioning skills and skills motivate students to be good if the teacher uses lesson study training. Application of training for physics teachers The Olympic coach through lesson study is assumed to improve the mastery of the concept of mechanics for physics teachers. The purpose of this study was to determine the effect of the application of lesson study on mastery of concepts in Mechanics Material. This research is a quantitative research product trial. Product trials were carried out with the design of one-group pretest posttest design to determine the effectiveness of the training model developed by comparing the state of knowledge before and after the implementation of the training management model. Based on the results of the t-test the paired samples correlations model shows that the sig value is greater than α, which is sig. Count (0.039) <α (0.05). Thus it can be concluded that there is a significant relationship between teacher competence before training and after training. It can also be seen from the correlation strength of 4.20 which shows that the pre-test and post-test data have a very strong correlation. Therefore the results of the analysis with the t-test are compared with the t-table value. The t-table value is obtained by looking at the number of trainees as many as 29 participants seen in table-t, amounting to 2.045. By comparing t-count and t-table values, it can be seen that the t-count value> t-table. This illustrates that there is a significant difference between the pre-test and post-test scores of the trainees. Also seen that the sig value is calculated <0.05. This shows that the participants' post test value is better than the pre-test value

Keywords - Training Management, Lesson Study, Mechanics Material

PRELIMINARY

As professional educators, teachers are required to have pedagogic, personal, professional / academic, and social competencies, in accordance with national education standards. In line with development policies that put the development of human resources (HR) as a national development priority, the position and role of teachers is increasingly meaningful in preparing quality human resources to face the global era. In relation to the learning process, Ihsan (2010: 5) says "in an educational process, learning is the most important process". Learning is all the effort made by the teacher.

Rusefendi (2001: 39) in his research results confirms that educational deterioration is not caused by the curriculum but the lack of teacher professional skills and student learning aversion. Professionalism emphasizes the mastery of science or management capabilities and their implementation strategies. Another fact from the results of the study shows that the low professionalism of teachers in Indonesia can be seen from the feasibility of teacher teaching.According to the Ministry of National Education's Balitbang, (http://goblogmedia.net/2010/08/26), teachers who are eligible to teach for primary and public elementary schools are only 28.94%, public junior high school teachers 54.12%, private 60, 99%, public high school teachers 65.29%, private 64.73%, public SMK teachers 55.91% private 58.26%. This fact shows that there are still many teachers whose level of teaching feasibility is inadequate. Observing this fact, it is necessary to take strategic steps in order to develop teacher professional competence. This means that, professionalism or teacher competency is generally still low because teachers are less trained to implement learning materials properly.

Various efforts have been made by various parties to improve teacher competency (in-service training), among others through teacher training, for example Teacher Employment Strengthening (PKG) training in the 80s, followed by PKG LKGI models (Core Teacher Job Training) and MGMP models (Subject Teacher Consultation) at the end of the 90s, Integrated Competency-Based Training (PTBK) in the mid 2000s, and other training conducted by NGOs, Higher Education LPM, and Professional Organizations.However, it refers to indicators of evaluation carried out by various institutions, both formal institutions such as by UNDP-UNESCO, as well as informal institutions for the training activities, where aspects of the evaluation include aspects of context, input, process, results and impact of activities, indicating that the results training in general does not have a significant impact on improving teacher competence. This can be seen from a number of indicators, including: the quality of

trainers that is still varied so that efforts to increase the ability and experience to other teachers are not optimal, the focus of attention is still oriented to the substance of the lesson and less attention to the needs and being studied by students, and most of the learning process in the class still uses one-way communication.

Through observation, from a number of schools in Central Maluku Regency, information was obtained about problems related to the low competency of physics teachers, namely: low ability to master physics learning materials as a whole, low ability to manage physics learning, ability to demonstrate professionalism as a competent physics teacher in competing in physics olympiad event, and low ability in social interaction towards physics learning. The low ability of mastering physics learning material is partly in the substance and methodology of subjects, as well as in the structure, materials, and curriculum organization of physics subjects.

Purwana (2006: 137) explained that increasing the ability of the Physics teacher in planning, implementing learning, can create a more interesting learning process, making students appear active and creative in exploring to find concepts and improvement in physics teacher teaching skills such as mastery of material, use of learning media , classroom management, questioning skills and students' motivation skills are good if the teacher uses lesson study training.

The important reason for teachers to use Lesson Study because Lesson Study is one of the efforts to improve the learning process and results carried out collaboratively and sustainably by a group of teachers (Rusman, 2011: 380). Thobroni (2011: 316) states that lesson study is an educator professional development through collaborative and continuous learning assessment based on the principles of collegiality and mutual learning to build a learning community.Lesson study is an activity that begins with the development of collaborative learning planning, the implementation of the learning process that is conducted openly by involving a number of observers, and followed up with discussion and post-learning reflection (Sadia, 2008: 464). Explanation of Lesson Study learning as such, raises the researchers' assumption that learning Lesson study will be effective to be applied in the learning of natural sciences such as physics subjects. In learning Lesson Study focuses on material or learning material that is considered important and becomes a weak point in student learning and difficult to learn by students (Thobroni, 2011: 320).

II. METHOD

To increase the level of effectiveness of the training management model through lesson study on improving the professional competence of the physics coaches of the Olympic coaches developed in this study, a product trial was conducted. Product trials were carried out with the design of one-group pretest posttest design to determine the effectiveness of the training model developed by comparing the state of knowledge before and after the implementation of the training management model. Sugiyono (2013: 537) states that to test the effectiveness of a product can be done by a before-affet (one-group pretest posttest design) experimental design, which compares the conditions before and after the application of the model. The training was attended by 29 teachers from high schools and junior high schools in Central Maluku Regency.

III. RESULTS AND DISCUSSION RESULTS

Pree test value table

Number Participants	amount Score	Percentage chievement of Results	Number Participants	amount Score	Percentage chievement of Results
1	14	48.28	21	9	31.03
2	15	51.72	22	12	41.38
3	9	31.03	23	15	51.72
4	12	41.38	24	10	34.48
5	12	41.38	25	14	48.28
6	9	31.03	26	17	58.62
7	13	44.83	27	15	51.72
8	16	55.17	28	14	48.28
9	10	34.48	29	16	55.17
10	12	41.38	Average	12.31	42.45
11	11	37.93			
12	14	48.28			
13	9	31.03			
14	10	34.48			

15	11	37.93
16	13	44.83
17	13	44.83
18	11	37.93
19	9	31.03
20	12	41.38

Post test value table

Number Participants	amount Score	Percentage chievementof Results	Number Participants	amount Score	Percentage chievement of Results
1	18	62.07	21	21	72.41
2	20	68.97	22	22	75.86
3	23	79.31	23	26	89.66
4	24	82.76	24	25	86.21
5	24	82.76	25	23	79.31
6	22	75.86	26	26	89.66
7	20	68.97	27	19	65.52
8	21	72.41	28	26	89.66
9	25	86.21	29	26	89.66
10	26	89.66	Average	22.76	78.48%
11	25	86.21			
12	24	82.76			
13	24	82.76			
14	20	68.97			
15	24	82.76			
16	26	89.66			
17	20	68.97			
18	18	62.07			
19	17	58.62			
20	25	86.21			

Results of Pre Test and Post Test data analysis Training participants through Lesson Study

Analysis of data derived from pre-test and post-test was carried out by t-test. Before the t-test is carried out a homogeneity test is carried out to find out that the data obtained is derived from a homogeneous sample. Homogeneity Test Results

Test of Homogeneity of Variances
Data Test

Levene Statistic	df1	df2	Sig.
.818	7	20	.583

Based on the table, it can be seen that the significance of the count (0.583) is greater than 0.05. Thus the data obtained is data derived from homogeneous samples. T-test is then performed as shown in the table.

T-Test Table, results 1
Paired Samples Statistics

Mean	N	Std. Deviation	Std. Error Mean
12.31	29	2.392	.444
22.76	29	2.811	.522

The table shows that the average test score (mean) has increased, namely 12.31 in the pree test to 22.76 in the post test. The standard deviation that shows the heterogeneity that occurs in the data before and after training is

2,392 and 2, 811 and the standard error of mean before and after training is 0,444 and 0,522. The standard error of mean describes the average distribution of averages of the average overall probability of the sample.

T-test table, results 2

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pree Test & Post Test	29	.150	.439

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pree Test - Post Test	-10.448	3.408	.633	-11.745	-9.152	-16.511	28	.000

DISCUSSION

Based on the results of the pre-test it appears that the knowledge of physical material specifically for mechanical material before training is still low, which is an average of 12.31 or an average percentage score of 42.45%. The low score achieved by the participants in the pre-test is understandable considering that the training participants are physics subject teachers, some of whom are junior high school teachers and some are high school teachers. Meanwhile from the post test it was illustrated that there was an increase in teachers' knowledge of mechanics. This can be seen from the average value achieved by participants, namely 22.77 or an average percentage of 78.48%. The post-test results showed that there was an increase in the teacher's knowledge about the mechanics material that was trained through the lesson study.

To determine the effectiveness of the training model, the data from the pre-test and post-test were carried out by t-test using the SPSS program. 16. Prior to the t-test, homogeneity is tested first. The homogeneity test is used to find out whether the data obtained is from a homogeneous sample. The homogeneity test results are obtained which are significant count (sig-hit) of 0.583. The sig-hit value of the homogeneity test is greater than 0.05 5% significance level. The results of this analysis provide that the pre-test data and post-test data obtained are data derived from homogeneous samples. The results of the t-test are as follows: (1) the average test (mean) value, in general before and after the training has increased, from 12.31 to 22.76

From the mean value, there was an increase in competence achieved by the training participants after the teacher was given training with a training model through lesson study after the teacher was given training. (2) the standard deviation that shows the honorificity that occurs in the data before and after training is 2,392 and 2,811 and (3) the standard error of mean before and after training is 0,444 and 0,522. the standard error of mean illustrates the average distribution of samples to the average of the average overall probability of the sample.

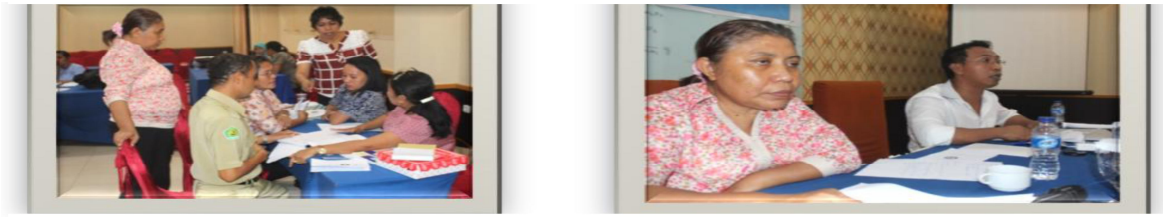
Based on the t-test model paired samples correlations gives a sig-hit result of 0.439 and a correlation value of 0.420. Analysis with paired samples correlations is an analysis that is used to show whether there is a relationship between the average pre-test value before training and the post-test value after training the teacher. Based on the results of the t-test the paired samples correlations model shows that the sig value is greater than α, which is sig. Count (0.039) <α (0.05). Thus it can be concluded that there is a significant relationship between teacher competence before training and after training. It can also be seen from the correlation strength of 4.20 which shows that the pre-test and post-test data have a very strong correlation.

Based on the results of the t-test, it shows that the training activities provided to the teacher through lesson study provide a significant influence on improving the competence of physics teachers as coaches of the physics olympiad.

Based on the t-test with paired samples test models obtained t-count of 16.511 and sig.hit of 0.000. The t-test with this model is intended to find out whether there is a difference between the data coming from the post test. Therefore the results of the analysis with the t-test are compared with the t-table value. The t-table value is obtained by looking at the number of trainees as many as 29 participants seen in table-t, amounting to 2.045. By comparing t-count and t-table values, it can be seen that the t-count value> t-table. This illustrates that there is a significant difference between the pre-test and post-test scores of the

trainees. Also seen that the sig value is calculated <0.05. This shows that the participants' post test value is better than the pre-test value

Based on the results and analysis of pre-test and post-test, observation and survey of teacher's interest and the teacher's response to the development of training packages, it can be concluded that the development of training management models through lesson study has very high effectiveness for improving professional competence of physics coaches of Olympic coaches. . This is in accordance with Sharma's opinion which states that the effectiveness of training is the extent to which participants can learn and apply the knowledge and skills acquired during training. In this case the physics teacher during the training through lesson study on mechanics material has gained good knowledge so that it can apply it to development of Olympic materials. The implementation of the training using the lesson study was designed for three days. The implementation of the training was carried out in the form of direct material delivery. In carrying out learning activities, guided by the instructor. The lesson study activity starts from the planning stage (plan) which aims to design student-centered learning, which is how students participate actively and think in the learning process. Some teachers can collaborate or teachers and lecturers can also collaborate to enrich ideas in making better planning. The activities carried out in the learning planning stage are as follows: (1) selecting the topics of study and analysis of problems in learning (teaching materials, learning methods / strategies, LKS, learning media), (2) deepening discussion of teaching materials, (3) developing teaching kits (lesson plans, LKS, and teaching materials), (4) discussing learning scenarios and classroom settings, (5) preparing class plans, and (6) preparing observation sheets.



Picture. teachers discuss in the planning stagePicture. the facilitator guides the teacher's discussion for the determination of the learning process

The second stage in Lesson study is the implementation (implementation) of learning to try out the learning design that has been formulated in this stage to aim at testing the effectiveness of learning models that have been designed and followed up by improving learning in their respective classes. The role of the model teacher in open lesson is to facilitate students to be involved in learning. Students are invited to think and exchange opinions with their friends. Other physics teachers act as observers. Likewise lecturers, can make observations in the learning. The presence of observers in the classroom in addition to gathering information is also intended to learn and get inspiration from ongoing learning and not to evaluate teachers.



The third stage in lesson study activities is reflection. Implementation and reflection are the core of lesson study. At both stages (observation and reflection) (teacher / observer) can learn how students learn, what factors influence and what students need in learning. At both stages, the teacher / observer can become a researcher by observing and analyzing, which then conveys orally during the reflection discussion. In the event that the reflection discussion cannot be present, the observer can submit his reflection notes to the moderator.

Based on the input from this discussion, the next lesson can be redesigned and the observer applies the learning improvements in each class, then the results of the implementation in each class are shared with friends at the next meeting. All parallel classes must obtain learning innovations. in target Madrasahs in the MGMP area, they have been impacted by learning innovations. The lecturers as resource persons must give comments on the open lesson activities before the reflection activity ends. Companion lecturer comments include aspects of teaching materials, learning, and Lesson Study. Which parts are good to

maintain and which parts need improvement and alternative solutions. The presence of lecturers as resource persons is not to lecture participants but rather as a facilitator to facilitate sharing of opinions and experiences among participants so that the learning community is built as a self-development forum.



Picture. The facilitator is leading the discussion

The use of lesson study that is applied in the trial class is one of the efforts to improve learning processes and results that are carried out collaboratively and sustainably by a group of teachers. By watching the practice of actual learning in the classroom, teachers can develop the same understanding or picture of what is meant by effective learning, which in turn can help students understand what they are learning. Thus students will get more teacher attention and observation in their learning experience, so that the implications for the average student achievement are higher than students in the control class whose learning uses conventional learning.

COVER

Based on data analysis and discussion that has been done can be concluded that:

1. The training management model for teachers of the physics olympiad coaches with lesson study can be used by schools to become a reference for training in the development of physics teacher competencies which are divided into three phases of activities: (1) planning consists of identifying needs, training objectives and programming and training tools ; (2) implementation with five activities, namely: (1) initial test; (2) model realization; (3) mechanics training with lesson study; (4) trial of lesson study on the material of motion kinematics; (5) final test.
2. The training management model for teachers guiding physics physics through lesson study, starting from planning, implementing and evaluating. The results of the study focused more on the ability to master training mechanics and management materials for training providers.

SUGGESTION

For further research, various studies can be carried out related to the application of lesson study in physics learning, such as the effect of lesson study on students' physics learning motivation so that the results of research on lesson study can truly be tested. This learning pattern is very suitable for teachers, especially for teachers who have the spirit to always improve the quality of learning.

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