

## THE IMPLEMENTATION OF *TEAM ASSISTED INDIVIDUALIZATION* (TAI) TYPE COOPERATIVE MODEL TO INCREASE LEARNING OUTCOMES IN WORK AND ENERGY

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### Abstract

In the process of studying physics, there are several problems that often encountered such as physics is one of the subjects considered to be complicated by most students. In addition, teaching activities that are generally still focused on teachers (teacher centered) and students are given less opportunity to work together in completing the structured tasks given by teachers. From these problems, it can be applied cooperative model type *Team Assisted Individualization* (TAI) as an alternative solution that encourages students actively involved in understanding the concept of physics so that learning process becomes meaningful then learning outcomes can be improved. The purpose of this research are to describe the implementation of TAI type cooperative model and to describe the improvement of learning outcome from knowledge, attitude, and skill aspect. This research is a quantitative research with Control Group Pre-test Post-test Design. Subjects in this study are class X MIA 1 as experimental class and X MIA 2 as control class. Methods of data analysis are by using interview method, observation method, validation method and test method which is test method consist of pre-test and post-test. Based on the result of the research, it can be concluded that the implementation of TAI type cooperative model has done well and there is improvement of student learning outcomes better after applying TAI type cooperative model from knowledge, attitude and skill aspect than student learning outcomes applying the conventional model.

**Keywords:** Cooperative Model, *Team Assisted Individualization* (TAI), learning outcomes, work and energy

### INTRODUCTION

Physics is a part of science relate about behavior, the structure of objects and the nature of phenomena which is consists of several elements such as space, physically observable and audible sounds (Susanti & Jatmiko, 2016). In the process of learning physics, students are expected to have the ability to understand concepts and able to reorder in their own language to present their thoughts in front of the class. But in the process of studying physics, there are some problems that often encountered such as students considered physics as difficult subjects because the concept of physics are abstract and often studied through a mathematical approach. In addition, the learning activities generally focused on teachers so that students are given less opportunity to work together in completing the structured tasks.

Based on the results of pre-research that had done on January 18 and 19, 2018 in SMAN 2 Lamongan, the results of the questionnaire on Thursday, January 18, 2018 in X-MIA 1 amounted to 36 respondents showed 58% of students stated that physics is a subject with many calculations. 58.3% of students stated that teachers often use lecture methods in teaching physics. And 97.2% of students stated that they rare to do

presentation during the learning process. Based on interviews with physics teacher, cooperative model needs to be applied in teaching and learning process because it can emphasize the students in constructing their knowledge through social interaction with peers. In fact, teachers rarely apply cooperative models in the learning process. Students receive only material which is written by teachers on the board so students are less able to work together in groups to complete group tasks. While based on the results of tests about work and energy that had done to 34 students of XI-MIA 3 on Friday, January 19, 2018 obtained an average score of 68.8. From the test result, 61,7% of students have not reached 70 (KKM score) and 38,3% of students have reached maximum completion criteria. So this indicate that the result of student learning is less than maximum in the field of knowledge related to work and energy.

Work and energy is the material of physics has been taught in ten grade of senoir high school. This material is closely related to everyday life even though the material has many calculations. However, students often find the difficulties to learn because the abstraction of this material.

From that problem, then comes a question how the learning can raise students' interest by involving interaction between students so learning outcomes can increase. Alternative solution from that problem can be overcome by implementing cooperative model so active participation of students can be increased by working together in group so that meaningful learning can be achieved. According to Amri and Ahmadi (2010), cooperative is a teaching-learning strategy which emphasizes group attitudes. There is a synergy arising from a common attitude that will increase the motivation to learn (Huda, 2013: 111). By applying cooperative model, students are expected to be active involved in the learning process, students will have experience in understanding the concepts of physics so that learning process becomes meaningful then learning outcomes can be improved (Sari & Supardi, 2016).

Cooperative learning model has various types one of them is Team Assisted Individualization (TAI). According to Susanti and Jatmiko (2016), the TAI type cooperative model combines cooperative learning with individual learning, students are better able to act as assistants to assist poor students so that the TAI type cooperative model is proper to be applied during learning process on work and energy. Based on this background, the title of this research is "The Implementation of Team Assisted Individualization (TAI) type Cooperative Model to Increase the Learning Outcomes in Work and Energy"

The purpose of this research are to describe the implementation of TAI type cooperative model and to describe the improvement of learning outcomes based on knowledge, attitude and skill aspects of ten grade students of SMA Negeri 2 Lamongan.

## METHOD

This type of research is a quantitative study with True Experimental design, in this experimental study there is a comparison group so there are group given treatment and group ungiven treatment then those results are compared. The form of True Experimental design selected is Control Group Pre-test Post-test Design which will be seen difference of achievement between control group and experiment. The research design look as follows:

**Table 1** Research Design (Source: Prabowo, 2013)

Class	Initial Measurement	Treatment	Final Measurement
Experiment	U <sub>1</sub>	L	U <sub>2</sub>
Control	U <sub>1</sub>	-	U <sub>2</sub>

The population of this study are ten grade students in SMA Negeri 2 Lamongan. The samples taken are class X MIA 1 as the experimental class and X MIA 2

as the control class. The methods used in data collection include interview method, observation method, validation method and test method. Interview method is done by interviewing physics teacher to know the process of implementation learning model during this time. Observation method is done by observing directly to describe the implementation of learning. Validation method is done by requesting the supervisor to give the feasibility of the learning materials. The test sheet is used to determine the improvement of learners' learning outcomes on knowledge competence after being given treatment. The results of pre-test are analyzed to determine normality and homogeneity. From normality results,  $\text{sig}_{\text{kolmogorov}} X \text{ MIA } 1 > X \text{ MIA } 2$  so X MIA 1 is determined as experiment class and X MIA 2 is determined as control class. Based on homogeneity results,  $\text{sig}_{\text{kolmogorov}} \text{ those class } > 0.05$  it can be concluded that  $H_0$  is accepted so that both subjects are normally distributed. Post-test results are analyzed to determine the average of student learning outcomes and student learning completeness. The analysis of learning implementation, attitude aspect analysis and skill aspect analysis are analyzed by determining mode value in every aspect observed by two observers.

## RESULT AND DISCUSSION

From the research that has been done, the data obtained is the implementation of learning and student learning outcomes.

### A. Analysis of the Learning Process Implementation

Analysis of learning process implementation can be known through observation sheet of learning process implementation. Below is the table of observation results of the implementation of learning as follows:

**Table 2** Results of Recapitulation of Implementation of Learning

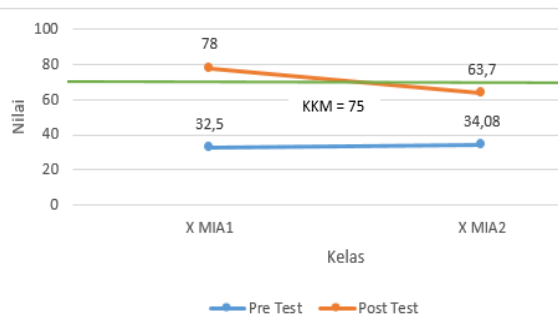
No	Observed Aspects	Experiment Class						Control Class					
		1st Meeting		Score		2nd Meeting		Score		1st Meeting		Score	
		List		List		List		List		List		List	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	Preface	√		3	√	4	√	3	√	3	√	3	
2	Core activities	√		3	√	3	√	3	√	3	√	3	
3	Closing	√		4	√	4	√	3	√	3	√	3	
4	Class Condition	√		3	√	3	√	3	√	3	√	3	
5	Time duration	√		3	√	3	√	3	√	3	√	3	

The scores are determined by looking for mode values in each aspect. Based on Table 2 it can be

concluded that cooperative learning model TAI type in class experiment class and conventional model in control class have done 100% well.

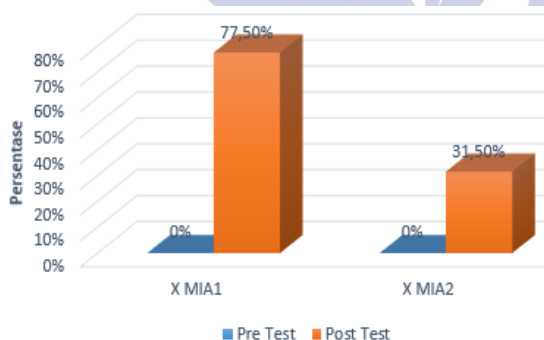
## B. Analysis of Learning Outcomes

### 1) Knowledge Aspect Analysis of Student Learning Completed Results



**Figure 1** Average Score Diagram of Student Learning Results

Based on Figure 4.1 it is state that the average score of pre-test of experiment class and control class have not fulfil the maximum completion criteria score. While for the post-test average value, experiment class has fulfilled the KKM but controll class is still below the maximum completion criteria score.



**Figure 2** Diagram of Student Learning Results Completeness

Based on the diagram, it is known that the result of pre-test of experimental class and control class are not totally complete while the result of experiment class post-test obtained 78,5% complete and control class obtained 31,5% complete.

### 2) Development Score Analysis

**Table 3** Development Scores of Experiment Class

Development Score	1 <sup>st</sup> Meeting		2 <sup>nd</sup> Meeting	
	Students	%	Students	%
5	0	0	1	2,5
10	1	2,5	2	5
20	14	35	11	27,5
30	25	62,5	26	65

Based on table 3, the percentage of students contributing a development score of 10 and 30 in first meeting is higher than in second meeting. This indicates that there are students whose quiz score increases so it can increase in the group development score.

**Table 4** Group Development Scores and Awards

Group	1 <sup>st</sup> Meeting		2 <sup>nd</sup> Meeting	
	Group Score	Awards	Group Score	Awards
I	25,7	Super Team	21,4	Great Team
II	22,8	Great Team	25,7	Super Team
III	28,5	Super Team	23,5	Great Team
IV	28,5	Super Team	27,1	Super Team
V	26,6	Super Team	28,3	Super Team
VI	23,3	Great Team	28,3	Super Team

Based on table 4 shows that there is an increase in group scores in groups II and VI which indicate an increase in learning outcomes in both groups. Learning outcomes of knowledge aspects for two research subject can be see on table 4.4 below

**Table 5** Learning Outcomes of Knowledge Aspects

No.	Ccriteria	Results	
		Experiment	Control
1	Best score	100	80
2	Worst score	50	50
3	Number of uncomplete students	9	28
4	Number of complete students	31	10
5	Number of students	40	38
6	Persentase	78,5 %	31,5 %



### 3) Attitude Aspect Analysis

**Table 6** Attitude Score Results of Experiment Class

Aspects observed	Meetings		Predicate
	1 <sup>st</sup>	2 <sup>nd</sup>	
Cooperation	3	3	Good
Opened	3	3	Good
Active (group)	2	2	Good
Active (individual)	3	3	Good
Want to know	3	3	Good

Based on Table 6, shows the overall attitude of students in experiment class have good category

### 4) Skills Aspect Analysis

**Table 7** Skills Quality Results of Experiment Class

Aspects observed	Meetings	
	1 <sup>st</sup>	2 <sup>nd</sup>
Creating Hypotheses	4	3
Investigate Genesis	4	4
Arrange Data	4	4
Analyzing Data	3	3
Summarizing Data	3	3
Presenting	3	3

Based on Table 7, score of each aspect is obtained on the skill assessment sheet at the first and second meetings. It can be concluded that the overall skills of students in class experiment class have good category.

## CLOSING

### Conclusion

Based on the analysis and discussion, it can be concluded as follows:

1. The result implementation of cooperative model TAI type in experiment class on work and energy for all aspects have categorized well
2. There is improvement of student learning outcomes better after implementing cooperative model TAI type in aspect of knowledge, attitude and skill than student learning outcomes which is implementing conventional model.

### Suggestion

Suggestions that can be given to the next researchers in order to carry out the research better include:

1. It is better to pay more attention to the management of time as best as possible so that planned activities can be done well.
2. It should be given a briefing first for students who become tutors to be able to guide friends in one group
3. For further researchers interested in cooperative model TAI type, it is suggested to develop extensive research in order to be used as reference for further research.

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