

# Meta-Analysis: The Effect of Cooperative Learning Models

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## ABSTRACT

This study aims to determine the learning outcomes of vocational education based on the Effect Size (ES) of many methods in cooperative learning. This study is a quantitative descriptive study with data collection techniques in meta-analysis by observing the components that are examined in some study articles based on analysis units groups. Based on the 24 articles that were used by respondents, 11 articles of them come from universities and 13 articles of them come from high schools with the sample of study ranged from 29 to 206 respondents. The learning method that has the highest effect size (ES) value is the learning method of Team Games Tournamen (TGT) with ES value of 5.37 and the lowest using the Think Pair Share learning method with ES value of -0.046. So based on the results of this meta-analysis, Team Games Tournamen (TGT) learning method is the most effective learning model in the learning process

**Keywords:** Learning Model, Meta- Analysis, Education

## I. INTRODUCTION

Education is one of the cultural practices, humans are dynamic and full of development. It IS expected that can create intelligent and open people so that the goals of national development can be realized. In the teaching and learning process, a special evaluation is needed to measure the level of students success in lesson. In order to simplify the evaluation process, a professional teacher is required to have a creative evaluation method, beside as a measuring tool, it must provide learning experiences develop students' understanding on lesson[1].

In teaching and learning activities, the method is very important component. Therefore, a teacher must determine the appropriate learning method used in each subject matter to create pleasant teaching and learning conditions in classroom[2]. The learning model can be seen as a starting point in learning process and the teacher can create their own learning model, due to learning model is not prescription, but as stimulators to activity. Learning is effort to create learning conditions including material, skills, social

relations, types of activities, facilities, and their impact related to interactions[3].

The paradigm shift in the process from teacher-centered to student-centered learning is expected to encourage students to be involved actively in gaining knowledge, attitudes, and behavior. The teacher serves as facilitator, so that in its application, student-centered learning can lead to interactions between students and students or students and teachers. This interaction can be happened if the cooperative learning model is applied[4]. Learning model is a way to student for educated that stud with invites students to work in pairs and verbally summarize lesson that they studied in the classroom. These activities will assist students in developing and relating facts and concepts in problem solving[5].

One of the learning models that are quite effective in applying to vocational students is the cooperative learning model. Cooperative Learning is a learning method or strategy in learning and teaching that emphasizes shared attitudes or behavior in working in other words learning is done by creating a number of

groups with a number of students of 2-5 children which aims to motivate each other among its members to help each other so that the goals can be achieved optimally. This model is also known as group learning. However, cooperative learning is more than just group learning or group work because in cooperative learning there is a cooperative structure or task that allows open interaction and effective interdependence among group members.

Learning model brings cooperation and mutual attachment of students in organizing tasks, working together to achieve goals, and guiding the competencies needed to achieve rewards. Different combinations lead to different learning outcomes. The meaning of learning outcomes is the changes on students, namely cognitive, affective, and psychomotor aspects as the result of learning activities[3].

In vocational learning, it is necessary to develop scientific and scientific attitudes related to technology for daily life. Meta-analysis can be used for quantitative study and statistical analysis to obtain data from previous studies in the framework of development that helps the writer to find consistency in cross-reviewing study result that focuses on variables and data collection methods. The overall results of this study show the effect of cooperative learning on vocational education which in turn improves learning quality. Based on the results of research conducted by Yasri (2019), the cooperative learning model using video as an interactive medium got students' learning motivation to increase in each cycle. The results of Rahmawati's (2014) on the Numbered Head Together B Type Cooperative Learning Model also showed that the results of the evaluation of learning outcomes for the upper class and lower group classes experienced an increase in gain of 0.44 and 0.38, respectively, which were included in the medium criteria. The results of the gain test of students' science process skills on the observation sheet, the scores obtained showed an increase in the upper group class of 0.66 with moderate criteria while the lower group class obtained an increase of 0.45 with moderate criteria.

**2. METHOD**

The experiment was conducted using the study of literature from journals that discuss cooperative learning model with experimental study design quasy case control approach and pretest posttest on trusted article that published in 2010 and 2020. The population in this study were vocational students. The

study method that will be used in this study is quantitative descriptive method because meta-analysis is an attempt to summarize various study results quantitatively.

The data collection technique used in this meta-analysis is the observation of the components that will be studied in several articles and study reports contained in 24 journals that were collected based on literature collected on 1 October - 25 November 2020. Next, the resume of study data is conducted in the form of study variables, objectives, types of study, data analysis and education levels. The criteria for selecting articles in this study include the following the selected articles are the results of research that has been carried out and used the cooperative learning method as the independent variable in the study, the articles selected for the dependent variable in this study are in the form of learning outcomes and student responses, the selected articles use students at Vocational High School or University level as study subjects, the study reports are prepared based on the coding of study reports obtained based on observations made.

The instrument used in data collection was the observation sheet using coding (data coding) and then carried out ES (Effect Size). There are several types of effect size in the data that is constructed in a dichotomy, continuous or ordinal manner. The data analysis technique used in this study is descriptive statistical techniques. This technique is used to calculate the effect (Effect Size) using the following equation:

**Table 1.** Effect Size Calculation

N o	Statistic s Data	Formula	Cod e
1	The average in one group	$ES = \frac{X_{post} - X_{pre}}{SD_{pre}}$	Code 1
2	The average in each group	$ES = \frac{X_{experiment} - X_{control}}{SD_{control}}$	Code 2

After obtaining the effect size (ES), the results can be interpreted into table 2 criteria.

**Table 2.** Classification of Effect Size (ES)

Effcet Size (ES)	Standard Category
$0 < ES \leq 0,2$	Very Low
$0,2 < ES \leq 0,5$	Low
$0,5 < ES \leq 1$	Medium
$>1$	High

### 3. RESULTS AND DISCUSSION

**Table 3.** Recapitulation of the effects of learning models

No	Researcher Name/ Year	Respondent	Collaborative Learning Method	Total Sample	Mean pre dan post test	Mean case and control	Standar Deviation (SD)	Effect Size (ES)
1.	[6]	SMK/SMA	<i>Tipe Head Together</i>	60	High class 66,08 81,12 Lower class 60,23 75,17	-	High class 10,56 9,15 Lower class 12,77 9,58	1,42   1,17
2.	[7]	PT	<i>Think Pair Share</i>	70	-	6,277 6,352	1,614 1,773	-0,046
3.	[8]	PT	TAPPS	64	63,59 76,87	-	11,23 9,97	1,18
4.	[9]	SMK/ SMA	<i>Cooperative Project Base Learning</i>	99	-	76,64 81,13	7,63 7,27	0,58
5.	[10]	SMK/ SMA	TGT NHT		TGT 41,25 80,45 NHT 37,5 75,08	-	TGT 10 7,3 NHT 11,76 7,58	5,37   3,19
6.	[11]	PT	<i>Blended Learning</i>	37	65,85 76,16	-	4,196 5,895	2,46
7.	[12]	SMK/ SMA	<i>Media PB Work</i>	60	-	4,83 5,26	1,32 1,86	0,32
8.	[13]	SMK/ SMA	<i>Role Play</i>	206	-	School 1 65,47 80,64 School 2 60,23 74,47 School 3 58,43 71,14	School 1 8,48 10,24 School 2 5,70 10,64 School 3 8,54 8,49	1,79   2,49   1,49
9.	[14]	PT	BMC	100	-	BCM 70,05 Control 62,25	11,67 11,18	0,69
10.	[15]	PT	PBL	30	74,56 78,22 82,56	-	6,34 6,17 9,70	1,26
11.	[16]	SMK/ SMA	Interactive Media Videos	29	70,24 84,37	-	9,00 7,88	1,57
12.	[17]	PT	<i>Mobile Base Project</i>	54	57 76	-	9,68	0,44
13.	[18]	SMK/ SMA	ICT	40	52,18 76,23	-	9,23 12,62	2,61
14.	[19]	SMK/ SMA	<i>Content Base On Dinamic</i>		3,9 8,4	-	3,33	0,74
15.	[20]	SMK/ SMA	<i>Problem Based Instruction (PBI)</i>	42	Control 66,10 81,57 Eksperiment 78,05 83,64	-	Control 9,13 9,79 Eksperiment 11,81 10,03	Control 1,69 Eksperiment 0,47
16.	[21]	PT	<i>Quantum Learning</i>	57	-	Control 62,038 Experiment 78,355	Control 5,344 Eksperiment 3,035	3,05
17.	[22]	SMK/ SMA	PBM dan STAD		PBM+STAD 48,44 56,83 PBM 39,35	-	PBM+STAD 8,40 PBM 6,47	PBM+STAD 0,99 PBM 1,00

No	Researcher Name/ Year	Respondent	Collaborative Learning Method	Total Sample	Mean pre dan post test	Mean case and control	Standar Deviation (SD)	Effect Size (ES)
					45,82 STAD 42,79 50,00		STAD 7,21	STAD 1,00
18.	[23]	PT	Problem Solving	52	-	64,96 74,96	10,903	0,917
19.	[24]	PT	PBL	46+57	-	68,14 71,67	4,11 3,36	0,858
20.	[25]	PT	Controversial Issues		-	59,21 76,12	17,47 8,56	0,97
21.	[26]	SMK/SMA	GQGA dan QSH	62	GQGA 11,03 28,65 QSH 10,39 23,52	-	GQGA 4,58 10,82 QSH 3,45 8,77	GQGA 3,85 QSH 3,81
22.	[27]	SMK/ SMA	Craft Model	88+88	-	67,00 88,02	4,57 4,48	4,59
23.	[28]	SMK/ SMA	Tutor Learning	32	73,10 81,10	-	12,92	0,62
24.	[29]	PT	Peer Led Guide Inquiry	87	-	33,03 34,16	9,89 11,69	0,11

Based on the results of the summary of table 3, the total effect size is 51.32 ( $\sum ES = 51.32$ ) with an average value of  $ES = 1.655$  which is taken from 24 research articles and consists of 33 learning methods. Based on 24 articles used by respondents, 11 articles of them come from universities, and 13 articles of them come from high school students, with study samples ranging from 29 to 206 respondents. The learning method that has the highest effect size (ES) value is the Team Games Tournamen (TGT) learning method with ES value of 15.79 and the lowest is using the Think Pair Share learning method with ES value of -0.046. The average learning method is high category with value of  $2.09 > 1$ . Teaching approaches varied between groups. While the experimental group experienced the TGT approach, the control group faced the conventional chalk and talk teaching approach. Data was collected at three o'clock points, namely pre-test, post-test1 and post-test 2 which lasted for four weeks each between each test. The results show a significant difference in the improvement of attitudes and achievements towards probability. In addition, cooperative learning. TGT also creates an active learning environment in completing exercises, and discussions between students and teachers. This study provides evidence that the possibility of studying with TGT benefits students [30]. Therefore, the TGT model can be used to increase student activity and learning outcomes. In research Aris et al (2020) it was also proven that the results of the analysis of the Teams Games Tournament model were able to improve students' mathematics learning outcomes starting from the lowest 16.8% to the highest score of 102.9% with an average of 32.59%.

#### 4.CONCLUSION

Based on the research results, the learning method with the highest effect size (ES) value is the Team Games Tournament (TGT) learning method with an ES value of 5.37 and the lowest is the Think Pair Share learning method with ES. value -0.046. So, based on the results of this meta-analysis, the Team Games Tournament (TGT) learning method is the most effective learning model in the learning process. Based on the results of the research that has been obtained, the conclusion that can be drawn is that the provision of cooperative learning model actions is viewed from the provision of good category actions.

#### AUTHORS' CONTRIBUTIONS.

All authors made substantial contributions to conception, design, analysis and interpretation of data; participated in drafting the and gave final approval of the version to be submitted.

#### ACKNOWLEDGMENTS

The writer's gratitude goes to Postgraduate Lecturers for Study Individual Studies at Padang State University.

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