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Student Team Achievement Divisions (STAD) Model through Minangkabau culture to Improve Economic Learning Achievement

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The purpose of this study was to assess the effectiveness of the STAD model based on Minangkabau culture in economic subjects. This research was a quasi-experimental study with the trial subjects being tenth grade high school students in economic subjects in Padang, Sumatera Barat Province, Indonesia and total 144 students. The basis for selecting test subjects is the Purposive Sampling technique. Data was analysed with the help of SPSS with the Two Way Anova technique. The results showed that the STAD learning model based on Minangkabau culture was more effective in improving student economic learning outcomes. The STAD model based on Minangkabau culture-based is effectively applied at all levels of the school because there is no interaction between the model applied and the school level.

Key words: *STAD, cooperative learning, minangkabau culture, learning achievement.*

Introduction

Education functions to empower human potential to pass down, develop, and also build the culture and civilisation of the future. On the one hand, education serves to preserve positive cultural values and on the other hand education serves to create changes towards a more innovative life. Therefore, education has a twin function (Budhisantoso, S., 1992; Pelly, U, 1992). With the twin functions, the original education system in an area has an important role in the development of education and culture**.**

But now the world of education is faced with two important aspects related to this function. First, the challenges faced by educational institutions in the era of globalisation. Second, the education system in schools which tends to be partial has made Indonesian people less familiar

with their culture. Globalisation has resulted in the achievement of educational goals, however independent living skills become increasingly complex (Rizfi, F., & Lingerd, B., 2000; Lingard, B., Martino, W., & Mills, M. (2009).

Conceptually, economic subjects are close to the environment. Therefore, economic learning should make optimal use of the potential of the local environment and culture to make it more meaningful (Armiati et al, 2019; Susanti & Rahmidani, 2020; Effendi & Effi, 2020). In fact in Indonesia, this has not been done by the teacher. Economic learning tends to not be contextual yet. No exception is seen in the province of West Sumatra, which is famous for the *Minangkabau* culture and rich in cultural ethical values. The potential of the local environment, especially the local culture, is not utilised optimally by the teacher in the learning process. Learning continues to prioritise the development of intellectual aspects with the teacher's textbook being the main learning source. Several conclusions from research results in Indonesia show this, including West Java Province (Rahmawati, (2015), Central Java Province (Bonawati, 2007), West Sumatra Province (Novriliam & Yunaldi, 2012), and West Kalimantan Province (Siska & Sulistyarini, 2019). This resulted in students not knowing their culture.

Economic learning in senior high school that is contextual, is conceptually expected to increase students' knowledge and appreciation of local culture, if they focus on cultural themes developed by integrating culture into the process. Integrating culture in the learning process requires a culture-based learning approach. Culture-based learning is a strategy for creating learning environments and designing learning experiences that integrate culture as part of the learning process (Pannen & Sardjiyo, 2005). This learning is based on a constructivist view that prioritises the creation of meaning in which students construct their knowledge based on the initial cultural experiences they have.

One learning model that can be used for this purpose is the STAD (Student Team Achievement Division) learning model. The STAD model is a cooperative learning model developed by Robert Slavin at John Hopkin University. STAD consists of five main components namely class presentations, teams, quizzes, individual progress scores, and team recognition (Slavin, 2011). The advantage of this model is learning by emphasising the activities and interactions between students and to motivate each other and help in understanding the subject matter.

Empirically, there have been many studies conducted to gauge the effectiveness of the STAD model. These studies include in mathematics (Rattanatumma, & Puncreobutr, 2016), in sports lessons (Siong et al, 2019), physics (Kasmini et al., (2020), biology (Muhfahroyin & Handoko, 2019), English (Ghaith, 2004), social science (Slagle, 2009), and economics (Wyk, 2012). However, from these studies, STAD learning models have not yet been implemented by integrating culture into learning. Therefore, this research is important for assessing the effectiveness of implementing the STAD learning model in economic subjects based on

Minangkabau culture.

Research Method

This research was conducted with a quasi-experimental one-group pretest posttest design. Researchers manipulate and control one or more independent variables and observe the dependent variable that is being investigated to find out if there are other variables that appear simultaneously (Thyer, 2012). The trial subjects were tenth grade high school students in economic subjects in 2 schools, namely Senior High School (SHS) number 7 Padang and Senior High School (SHS) number 13 Padang, totalling 144 students. The basis for selecting test subjects is the Purposive Sampling technique.

Cognitive learning outcomes are used to measure students' mastery levels. The effectiveness of the learning model Based on *Minangkabau* Culture can be seen from the scores of improved student learning outcomes using the Normalised gain Hake formula (Meltzer & Manivannan, 2002).

$$\text{Normalised gain (g)} = \frac{\text{posttest score - pretest score}}{\text{Maximum possible score – pretest score}}$$

Interpretation: The data uses classifications like Table 1.

Table 1: Classification of Normalised Gain (g) Hake Results

Normalises Gain Value (g)	Classification
$g \geq 0.70$	High
$0.30 \leq g > 70$	Medium
$g < 0.30$	Low

The test instrument used to measure student learning outcomes is in the form of multiple choice. The tests used in this study are the initial test (pretest) and the final test (posttest). The result are used to determine differences in student learning outcomes that use the learning model based on *Minangkabau* culture (experimental class) using conventional learning models (control class). The instrument test has been tested for validity, reliability, and analysis of the instrument items using a test of distinguishing power and difficulty level.
To determine whether there are significant differences in student learning outcomes between the control class and the experimental class a statistical test is performed. Before testing the hypothesis, the normality test is carried out, the homogeneity test of the variance of the two data groups. This data processing uses SPSS. The hypothesis is written in the form of a statistical hypothesis with a two-party test, namely:

Ho: $\mu_1 = \mu_2$

H1: $\mu_1 \geq \mu_2$

μ_1: The average score of the experimental class

μ_2: The average score of the control class

Two way Anova test was conducted to see the interaction between the application of the Learning Model based on *Minangkabau* culture in influencing student learning outcomes at two schools with different levels, namely high level (SHS number 7 Padang) and low level (SHS number 13 Padang). Interaction factors can be seen in Table 2.

Table 2: Interaction Factors of Two Way Anova Test

Student learning outcomes	**Experiment Class (B1)**	**Control class (B2)**
SHS number 7 Padang (A_1)	A1B1	A1B2
SHS number 13 Padang (A_2)	A2B1	A2B2

Description:
A1B1 = Student learning outcomes of the experimental class at SHS number 7 Padang
A1B2 = Student learning outcomes of the control class at SHS number 7 Padang
A2B1 = Student learning outcomes of the experimental class at SHS number 13 Padang
A2B2 = Student learning outcomes of the control class at SHS number 13 Padang

ANOVA test condition is normally distributed and homogeneous data. The results of data analysis are also seen through the curve, if there is no intersection of the lines in the curve means the interaction is not seen. The following explanation of the two-way ANOVA test to see the presence or absence of interaction.

Factor: Learning Model Based on *Minangkabau* culture on student learning outcomes

H0: Learning Model based on *Minangkabau* culture does not significantly influence learning outcomes
H1: Learning Model based on *Minangkabau* culture significantly influence learning outcomes

Decision-Making

If significance > 0.05 H0 accepted and vice versa.

Result and Discussion

Based on the research results obtained learning outcomes data as follows:

Table 3: Average Learning Outcomes

School	Class	N	Average Pre test	Average Post test	Average Gain (Δ)
SHS number 7	Experiment	36	53.5	87.5	0.72
	Control	36	36.3	75.8	0.62
SHS number 13	Experiment	36	50.6	80.6	0.61
	Control	36	35.9	74.3	0.60
	Total	144			

Based on Table 3, it appears that there is an increase in the average student learning outcomes in the experimental class and the control class. But the increase in learning outcomes in the experimental class with STAD learning model based on *Minangkabau* culture is higher than the increase in learning outcomes in the control class. Based on Table 3, it can be seen that the average gain of learning outcomes of students learning with learning model based on *Minangkabau* culture is higher than the average gain of learning outcomes of students learning with conventional learning models.

Before the hypothesis test is carried out, the analysis requirements test is first performed. The requirements analysis test carried out is the normality test and the homogeneity test. A summary of the normality test results can be seen in the following Table 4:

Table 4: Data Normality Test Results Improved Learning Outcomes

School	Class	Kolmogorov-Smirnova	Shapiro-Wilk	Comparison with α	Information
SHS number 7	Experimental class	0,183	0,136	0,05	Normal distribution
	Control class	0,186	0,396	0,05	Normal distribution
SHS number 13	Experimental class	0,104	0,111	0,05	Normal distribution
	Control class	0,200	0,631	0,05	Normal distribution

Criteria for data are normally distributed if significance > α. Data processing results for SHS number 7 using *Kolmogorov- Smirnov*[a] showed significance in the experimental class 0.183 > 0.05 and for the control class 0.186 > 0.05. The results of data processing for SHS number 13 show significance in the experimental class 0.104> 0.05 and for the control class 0.200> 0.05, as well as using *Shapiro-Wilk*. Based on these results it can be concluded that the data for both classes are normally distributed. Next in Table 5, the homogeneity variance test results are displayed.

Table 5: Results of Analysis of Homogeneity Test Data Variance Learning outcomes

School	Significance value	Ratio With α	Information
SHS number 7	0,492	0,492 > 0.05	Homogeneous
SHS number 13	0,961	0,961 > 0.05	Homogeneous

Homogeneous variance criteria if sig > α. The results of data processing at SHS number 7 Padang showed significance obtained by 0,492 > 0.05 while at SHS number 13 Padang showed significance obtained by 0,961 > 0.05, it means that the data variance increased of student knowledge aspect is homogenate.

From the results of testing the requirements analysis, the results obtained in the two testing schools of the two classes of data samples are normally distributed and homogeneous, so the hypothesis is tested using the t test. Statistical hypothesis for the t test:

H0: μ1 = μ2
H1: μ1> μ2

The criterion for acceptance of H0 is accepting H0 if the value of significance > 0.05, and rejecting H0 if vice versa. The results of the effectiveness of the STAD learning model based on *Minangkabau* culture can be summarised in Table 6.

Table 6: T-Test Analysis Results Student Learning Outcomes of SHS number 7 and SHS number 13 Padang

School	Class	N	The mean	Std. Deviation	Std. Error Mean	Sig. (2-tailed)
SHS number 7	Experiment	36	87.5056	7.40833	1.23472	0,000
	Control	36	75,8333	8.70891	1.45149	
SHS number 13	Experiment	36	80.6472	8,72299	1.45383	0.003
	Control	36	74.2528	8,96595	1.49433	

Results: Significance value of 0,000 and 0,003 <0.05 (reject H0)

Based on the results of the effectiveness test with the t-test for the control class and the experimental class in the two schools above, it can be concluded that there are significant differences in learning outcomes in each school. This means the null hypothesis (H0) is rejected. That is, in each school there are significant differences in learning outcomes between the control class and the experimental class, where the learning outcomes of the experimental class are proven to be higher than the control class. This proves that using the *Minangkabau* culture-based learning model is effective for improving student learning outcomes.

The results of a two-way interaction analysis of aspects of STAD learning model based on *Minangkabau* culture on student learning outcomes in both schools with different levels can be seen in Table 7 and Table 8.

Table 7. Descriptive Statistics

Dependent Variable: Learn_Results				
Method	School	The mean	Std. Deviation	N
Experiment	SHS number 7	87,5006	7.40577	36
	SHS number 13	80,641	8,72223	36
	Total	84.0743	8.74322	72
Control	SHS number 7	75,8333	8.70625	36
	SHS number 13	74.2586	8.96593	36
	Total	75.0460	8.81034	72
Total	SHS number 7	81.6669	9,94547	72
	SHS number 13	77.4533	9.35311	72
	Total	79.5601	9.84959	144

Levene's Test of Equality of Error Variances

Dependent Variable: Learn_ Results

F	df1	df2	Sig.
.713	3	140	.546

Table 8: Tests of Between-Subjects Effects

Dependent Variable: Learn Results					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3824,246a	3	1274,749	17,760	.000
Intercept	911493,461	1	911493,461	12698,903	.000
Method	2934,389	1	2934,389	40,882	.000
School	639,163	1	639,163	8,905	.003
* School Method	250,694	1	250,694	3,493	.064
Error	10048,828	140	71,777		
Total	925366,534	144			
Corrected Total	13873,074	143			

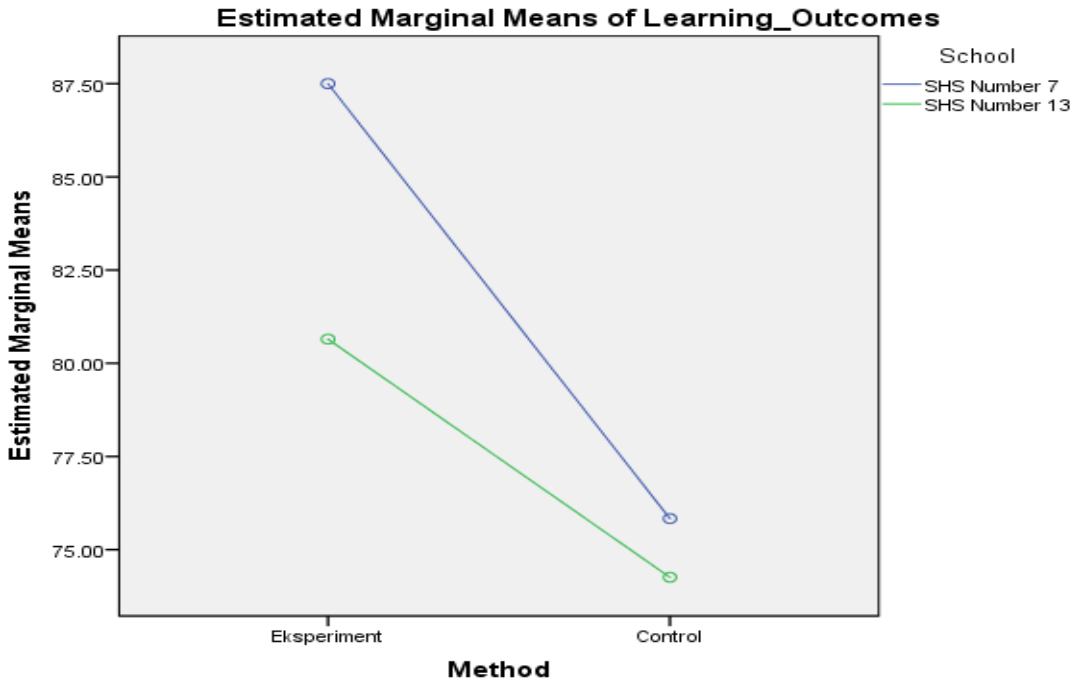
a. R Squared = .276 (Adjusted R Squared = .260)

Decision-Making

If the significance is > 0.05, accept H0 and vice versa

Results: Significance value of 0,000 < 0.05 (H0 rejected).
The results of the interaction analysis from Table 55, Table 56 and from Figure 14 show no interaction, because there is no intersection of the curve lines. Seen from the learning outcomes obtained by the experimental class and the control class in all school trials the experimental class learning outcomes that use learning model based on *Minangkabau* culture are higher than the control class. This means the learning model based on *Minangkabau* culture is effectively applied at all levels of the school.

Figure 1. Interaction Test Results (two way ANOVA) Student Learning Outcomes of SHS number 7 Padang and SHS number 13 Padang



Student knowledge can increase along with increasing student activity in learning (Demetriadis et al, 2008). The application of the STAD learning model based on *Minangkabau* culture is proven that it can increase student participation and activeness in learning. Based on the results of the study the learning outcomes obtained from the trial school SHS number 7 and SHS number 13 Padang, show that the learning outcomes of students who learn with the STAD learning model based on *Minangkabau* culture are significantly higher than the learning outcomes of students who learn in conventional ways. At the trial school seen from the

differences in N-Gain, the results of trials in SHS number 7 N-Gain were 0.72 in the experimental class and 0.62 in the control class and in SHS number 13 in the experimental class 0.61 and 0.60 in the control class. This shows the effectiveness of the learning model based on *Minangkabau* culture.

Higher learning outcomes of the experimental class students learning with the STAD learning model based on *Minangkabau* culture are supported by the availability of a support system in the form of student manuals. The book is arranged based on the learning syntax based on *Minangkabau* culture so that it can be used as a guide for students to learn, both independently and in groups.

Based on the analysis of learning outcomes data, a significant difference in learning outcomes between the experimental class and the control class in the pilot school shows that the STAD learning model based on *Minangkabau* culture is effective in improving learning outcomes and fostering student cultural appreciation. Thus it is suitable for implementation at all levels of the school, because the STAD learning model based on *Minangkabau* culture facilitates students to learn cooperatively (Archer-Kath, 1994).

The existence of team learning activities and making connections that are integrated in learning can be used as a means to improve understanding of concepts and increase students' *Minangkabau* cultural knowledge. In the culture-based learning process students are trained to be able to create meaning and reach an understanding of what is being learned. This means that at the stage of making connections, students can relate the cultural information presented at that time to the economic concepts being studied. This is in line with the opinion of Shawahid (2015) who explains that the ability to make connections and connecting facts is an important part in generating conclusions from a problem. Learning process is not merely memorising concepts or facts, but is an activity of connecting concepts or producing a complete understanding, so that the concepts learned will be well understood and not easily forgotten (Joyce, 2004).

The STAD learning model based on *Minangkabau* culture which is already developed can be used by teachers in implementing effective and efficient learning. A learning model is a conceptual framework that describes a systematic procedure in organising learning experiences to achieve certain learning goals, and has a function as a guide for learning designers and instructors in planning and implementing teaching and learning activities (Joyce, 2004).

The STAD learning model based on *Minangkabau* culture also meets the model's characteristics. The learning model has four special characteristics namely: (1) The logical theoretical rational compiled by the developer. The learning model based on *Minangkabau* culture has a theory of thinking that makes sense, considers the theory with actual reality, and is not fictional in creating and developing it, (2) The foundation of thought about what and how students learn (learning objectives to be achieved). The learning model based on *Minangkabau*

culture has explained the principles of reaction and social systems that describe what and how students learn well and work in teams, (3) Teaching behaviour has also been explained in the social system, so that the learning model based on *Minangkabau* culture can be implemented successfully, so that what has been the ideal of teaching so far can be successful in its implementation, and (4) Learning environment is needed so that learning objectives can be achieved. The learning model based on *Minangkabau* culture has a conducive and comfortable learning environment, so the learning atmosphere can be one of the supporting aspects of what has been the aim of learning (Arends, 1997).

One peculiarity of the learning model based on *Minangkabau* culture is found in the learning steps, because the learning step shows the activities of educators and students in a balanced way. The balance of this activity is called moderate activity. The advantages of moderate activity in the learning process will help the absorption of learning material for students who have intermediate abilities and below.

The learning model based on *Minangkabau* culture was developed from the STAD learning model. The effectiveness of learning using the STAD model has been tested through previous studies. The STAD Cooperative Learning Model can be used by teachers in teaching social and economic science subjects and other materials to improve student learning outcomes (Elpisah & Bin-Tahir, 2019; Sepriyanti, 2019. Furthermore, research conducted by Wyk also found that the STAD learning model can improve student learning outcomes, attitudes and motivation and many other studies (Wyk, 2012).

Furthermore, the syntax of the STAD learning model is developed into a learning model based on *Minangkabau* culture. This learning model integrates the *Minangkabau* culture in learning. Many studies have shown the effectiveness of learning that integrates culture in it. Research conducted by Simons, Lori et al found that culture-based learning effectively improves critical thinking and social responsibility of students (Simon et al, 2011). Culture-based learning is also effective for increasing student motivation and learning outcomes by utilising *Bengawan Solo* as a learning resource (Leo, 2015). Research conducted by Purnamasari et al (2017) has been able to provide knowledge and add insights and actualisation to students about Javanese cultural values in economic learning. Findings based on this study indicate that the STAD learning model established on *Minangkabau* culture has proven its effectiveness.

Conclusion

This study revealed that the STAD cooperative learning model based on *Minangkabau* culture was proven to be able to improve student economic learning achievement. In addition, it is clear that there are differences in student learning outcomes when compared with before and after treatment. Students who learn using STAD cooperative learning model based on *Minangkabau* culture have higher learning outcomes compared to students who learn using

conventional methods. Therefore, it can be concluded that the STAD cooperative learning model based on *Minangkabau* culture plays an important role in improving student learning outcomes.

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