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The Impact of SARD-Based Cooperative Learning with the Patik Bali Application on Motivation and Learning Outcomes in Balinese Script Instruction Abstract

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ABSTRACT

Balinese script learning in schools still faces obstacles of low motivation and student learning outcomes due to the use of conventional models that do not actively involve students. The study aims to determine the effectiveness of the Student Teams Achievement Division (STAD) type cooperative learning model based on the Patik Bali application on students' motivation and learning outcomes in writing Balinese script. This study uses a quasi-experimental design method with the subjects of class X students of SMA Negeri 10 Denpasar which is divided into experimental classes and control classes. The instruments used included learning outcome tests and learning motivation questionnaires. Data analysis was carried out using the MANOVA test to see the effect of the learning model on two variables that rotate simultaneously. The results of the study show that the Patik Bali application-based STAD model has a positive and significant influence on student motivation and learning outcomes. The average learning motivation of the experimental class was 72.78 and the learning outcome was 81.86 higher than the control class which obtained an average motivation of 61.25 and learning outcomes of 75.25. These findings show that the integration of technology through the Patik Bali application in the cooperative learning model can increase student participation and understanding in Balinese script learning. This research offers a new contribution by integrating the culture-based Patik Bali application into the STAD cooperative learning model specifically designed for Balinese literacy learning and combining regional language preservation with digital pedagogy to improve student motivation and learning outcomes.

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1. INTRODUCTION

Learning in school has a close relationship with the development of writing skills as one of the language skills that must be mastered by students. One way to improve language skills in writing is to learn to write Balinese script. The implementation of learning to write Balinese script not only directs students to understand how to write but also invites them to be able to preserve their culture. In the process of learning to write Balinese script, students are expected to be able to think critically in understanding and expressing their ideas in the form of Balinese script transliteration or converting Latin letters into Balinese script or vice versa (Abdullah & Rochmadi, 2020; Learning, 2001). So that to develop Balinese script writing skills, students should know the various forms and rules that develop in writing Balinese script.

Seeing the importance of the implementation of education as an effort in the formation of human resources, especially in the preservation of the Balinese script, "there is a need for efforts to improve the quality of education in a sustainable manner in the form of the implementation of learning in schools. So that in this case, teachers are one of the important components in directing students to achieve the set teaching goals. There is learning to write Balinese script in schools which should provide educational value and motivate students, but if you apply learning conventionally, it results in less effective learning. Conventional learning leads to the teacher as the center or in other words, the teacher who plays an active role in learning (Adair & Jaeger, 2016) (Adams, 2020). In addition, he explained that the development of conventional models by teachers is usually composed of lectures, short discussions, and ends with assignments to students. In the matter of teaching Balinese script writing, the most prominent lecture method of implementation shown by the teacher will be more talking or lectures in class in the provision of teaching materials. With the implementation of learning like this, it results in students who are less trained in finding and processing the information obtained so that students' understanding or interpretation in learning is very low.

The learning process that applies conventional methods is also found in Balinese language subjects, especially in the competence of writing Balinese script at the high school level. SMA Negeri 10 Denpasar as one of the schools that also applies the conventional model. Based on the results of discussions with Balinese language teachers, students were given Balinese script writing theory, followed by giving examples by the teacher, and ended with an assignment that directed students to transliterate Balinese script. Habits like these result in students not being interested and understanding the material is low, which then leads to a lack of motivation to learn and low learning outcomes for students. Problems like this are one of the tangible manifestations of challenges in teaching Balinese script writing. To respond to problems like this, teachers should be able to design effective and efficient learning so that students become active and enthusiastic in learning. The efforts that can be made to deal with these problems are to carry out learning by implementing learning models, methods, strategies, and learning media that are also adapted to the characteristics or learning styles of students (Lannin et al., 2006) (Kong, 2014).

The existence of an effective and efficient learning process so that it can increase learning motivation and student learning outcomes is proof of the existence of professional teachers in teaching. However, in fact, Balinese language teachers at SMA Negeri 10 Denpasar have not been able to implement effective and efficient learning, which is shown by the enthusiasm of students in learning is still low and they are more interested in their mobile phones than focusing on teachers. According to

(Abbas et al., 2023) dan (Ainley, 2006) Stating that a good teacher is a teacher who is able to act as a motivator for students, and direct them to be able to be active and creative in learning. Based on this statement, teachers are required to be able to design and implement learning processes that are in accordance with the characteristics of students. The development of the learning paradigm that is appropriate to be applied to the characteristics of students today is the implementation of a learning process that is student-centered and able to apply technology in their learning. According to (Afamasaga-Fuata'i, 2008) dan (Aksu & Koruklu, 2015) explained that student-centered learning will provide opportunities and facilities for students to be able to form their own knowledge or deep understanding so that the quality increases.

The implementation of student-centered learning is very diverse. In overcoming learning problems, a learning model is needed that is able to support the completeness of the problems experienced (Anjaeni, 2021) (Hariyanto et al., 2022). The existence of a learning model that can make students want and enthusiasm in learning to write Balinese script is an important task for teachers. The learning models whose implementation is student-centered are offered for use by teachers such as: small group discussion model, self direct learning model, cooperative learning model, problem-based learning model, and project-based learning model. However, in learning to write Balinese script to increase enthusiasm and motivate students in learning, as well as improve their learning outcomes, learning activities based on cooperation or group discussions are needed.

The existence of group learning is able to effectively and efficiently help students in getting to know various forms and rules in writing Balinese script. Because learning to write Balinese script at the high school level is a learning process that empowers students to be able to master knowledge, values, attitudes, and social skills that exist within themselves. Collaborative activities will be able to motivate students to be enthusiastic in learning, and be able to minimize students' negative views or thoughts on the Balinese script (Amirali, 2010; Apiola & Sutinen, 2020; Kong, 2014). Thus, learning with a cooperative model as an offer is provided to be applied by Balinese language subject teachers in teaching Balinese script writing materials.

Students are trained to interact and share information and experiences with each other as a form of application of a cooperative model that allows them to learn to complement each other or understand each other's strengths and weaknesses. Additionally, this learning model emphasizes group work, which encourages students to actively participate in discussions. The cooperative model of learning emphasizes the group learning process is very much in accordance with human nature, namely as a social creature which in its application describes the existence of a sense of shared responsibility, division of tasks, and feelings of solidarity (Tarigan, 2020; Dagienė & Stupurienė, 2016). Therefore, this learning model is often referred to as learning that works together in character. According to Kulsum & Nugroho (2014) mentioned that there are various types of cooperative learning model development, namely *team game tournaments*, stads, *jigsaws*, and *group investigations.*

Based on the four types of development of the cooperative learning model, the stad type is a suitable and *simple* model applied to learning to write Balinese script compared to other types, because it has a very significant influence in arousing a sense of cooperation and exchanging ideas or knowledge which emphasizes students to help each other and teach each other in each study group during discussions and Balinese Script Writing Practice. Another difference in the type of learning can be found in the final learning process which will test individual student learning results in the form of writing tests or converting Latin writing into a form of Balinese script, so that based on the test results as proof that the previous group discussions and exercises went well. This means that in this type of learning, all group members have a dual role in learning to write Balinese script, namely as students in learning to understand Balinese script writing material with its various rules and as teachers in helping and teaching their group friends who do not understand Balinese script writing material with its various rules during discussions and exercises.

The combination of the STAD-type cooperative learning model with the local application *of Patik Bali* is an innovative strategy that unites a collaborative pedagogical approach with the use of local

culture-based technology. The STAD model encourages social interaction, cooperation, and shared responsibility, which is highly effective in improving student motivation and learning outcomes. When integrated with *the Patik Bali* application, the Balinese script learning process becomes more contextual, interesting, and relevant to students' interest in the use of digital technology. This approach not only strengthens cognitive mastery of Balinese script, but also facilitates the preservation of local culture in modern classrooms. The use of digital applications such as *Patik Bali* makes learning more interactive and able to overcome the limitations of conventional methods that tend to be passive. In addition, the integration of technology strengthens the learning experience that is authentic and contextual, so that students can more easily understand the form and rules of writing Balinese script. This strategy indirectly forms cultural awareness and pride in ancestral heritage among the younger generation. As an effort to preserve an education-based culture, this model is relevant to the demands of 21st century learning that emphasizes digital literacy and collaboration. Through the implementation of local application-based STAD, teachers can act as facilitators who guide students to become active and critical learners. Therefore, this model is very appropriate to be applied at SMA Negeri 10 Denpasar to strengthen local culture while answering learning challenges in the digital era.

This research shows a strong linkage with international and local literature through the use of relevant key theories, such as the theory of learning motivation, the effectiveness of cooperative learning, and the importance of technology integration in education. The approach used refers to the STAD model which emphasizes the importance of group cooperation and individual responsibility in improving learning outcomes. Local literature also strengthens the cultural context of learning, especially in the preservation of the Balinese script. In addition, this research also includes the use of artificial intelligence and digital technology in supporting cultural-based contextual learning. By enriching the understanding of the challenges of conventional learning and the urgency of technology-based pedagogical transformation. This article consistently demonstrates the integration of theory and practice, linking previous studies to local innovations, namely the use of *Patik Bali* applications in cooperative learning. This creates a strong theoretical foundation in examining the influence of learning models on student motivation and learning outcomes. The integration of this literature shows that research is based on credible and globally and locally relevant scientific frameworks.

The implementation of the stad-type cooperative learning model is an effort that actively involves students in the learning process that not only requires them to memorize the material but also understand the concept. The main feature of the stad-type cooperative learning model is the division of classes into several small groups (Ardiyani et al., 2018). Tipe pembelajaran Stad menekankan pada aspek kebersamaan dan bergotong-royong dengan tujuan utamanya yaitu membangkitan motivasi siswa agar membantu rekan kelompoknya dalam memahami dan menguasai sajian materi yang diberikan oleh guru (Voogt et al., 2013; Benakli et al., 2017). Model kooperatif dengan tipe stad mengimplementasikan adanya kerja kelompok serta meningkatkan kerja sama dan tanggung jawab bersama sehingga menciptakan adanya interaksi yang baik untuk mencapai tujuan pembelajaran (Tarim & Akdeniz, 2008; Muller et al., 2020).

In other words, the application in the concept of stad is that all group members must understand the subject matter, because it will be followed up in the form of assessments or individual tests given by the teacher. Based on this statement, each group member has a responsibility for mastering the material to all group members. Therefore, the stad cooperative learning model is considered an appropriate, effective, and efficient model to solve problems related to increasing students' motivation and learning outcomes in writing Balinese script. More specifically, this model is intended to prepare students in groups to face and complete exams individually after the learning activities have ended. Because of this statement, the student team achievement division (Stad) type cooperative learning model is recommended to be applied at SMA Negeri 10 Denpasar, especially in learning to write Balinese script.

The stad-type cooperative learning model is a learning model that is oriented towards learning activities by working together to understand the material provided by the teacher. However, seeing the

number of class x students at SMA Negeri 10 Denpasar who tend to be more interested in their mobile phones, the application of the stad-type cooperative learning model in learning to write the Balinese script should also be done with the use of technology, namely in the form of application facilities as a learning medium. In order for the design of the chosen learning model to be optimally applied, it needs to be supported by technology-based learning media to support it (Baafi & Atieno, 2020). In today's technological era, when the Balinese cultural context is increasingly changing due to foreign culture, the preservation of the Balinese script can be done by digitizing the Balinese script through the creation of applications and software that support learning (Deschryver & Yadav, 2015; Coleman, 2023). With the digitization of the Balinese script, the existence and preservation of the Balinese script will still exist and be used in the future. Based on this statement, the application of learning to write Balinese script by implementing a stad-type cooperative learning model needs to be blended with technology as a learning medium.

The use of technology in education has indeed become an important part of enriching students' learning experiences and increasing learning effectiveness. In learning materials for writing Balinese script, there are various technology-based learning media that can blend with the application of a stad-type cooperative learning model such as: 1) Balinese script web, namely: Balinese script online and keymanweb.com, and 2) Balinese script application, namely: Balinese script writing, Balinese script transliteration, and Balinese script keyboard (Patik Bali). Based on the problems experienced by teachers and students as explained above to be able to help students remember and know various forms of Balinese script, the Patik Bali application is an effective medium used in learning to write Balinese script.

The novelty in this study lies in the integration of the STAD-type cooperative learning model with the Patik Bali application as a local culture-based media to improve motivation and learning outcomes of writing Balinese script, but some of the references used are still descriptive and have not been used critically to build arguments or debate existing theories. Although conceptual frameworks have included motivational theory, the effectiveness of cooperative learning, and educational technology, the use of the literature is more dominant as confirmation than as a critical foothold. To reinforce the novelty, it is necessary to include the latest empirical studies that discuss the use of culture-based applications in the context of 21st-century learning, especially those that focus on the integration of digital technologies in the preservation of local languages and scripts. Such references would provide stronger support for the claim of originality, as well as demonstrate the position of this research in the global discourse on education based on local wisdom. By adding cutting-edge literature and comparing it critically, this article can demonstrate a significant contribution to the development of culturally based pedagogical practices relevant to local contexts and digital transformation.

The Patik Bali application is one of the application innovations on *Android* that can be used to write Balinese script because it is in the form of a digital keyboard equipped with Latin letters and Balinese script. The Balinese batik application can be used to improve students' ability to write Balinese script (Apiola & Sutinen, 2020; Masood & Hoda, 2014). The Patik Bali application as a medium that can be used to support the implementation of the stad-type cooperative learning model in learning to write Balinese script. In addition, referring to the interest of students in the use of mobile phones, it is very certain that the patik application will direct them to be motivated in learning, especially learning to write Balinese script. By combining the stad-type cooperative learning model and the Patik Bali application, it will lead students to discuss, think critically and be active in working together in groups and make it easier for students to get to know the Balinese script.

Based on the description of these facts, it is very reasonable for researchers to carry out research on the application of a learning model that is in accordance with the expectations and demands described. Therefore, a study entitled "The Influence of the Stad-Type Cooperative Learning Model Based on the Balinese Patik Application on the Motivation and Learning Outcomes of Balinese Script Writing for Class X Students of SMA Negeri 10 Denpasar".

2. METHODS

Types of Research

This research is a type of quasi experimental design or pseudo-experiment research. This design is carried out in situations and conditions that do not allow for the control or manipulation of all relevant variables (Maghfiroh & Diana, 2016; Sugiyono, 2009). The application of a type of pseudo-experimental research to be able to find out the influence that arises as a result of the different treatment given to each group.

Objects and subjects of research

1. Research object

   Referring to the description in the sub-introduction above, it can be stated that the object of the research is the stad-type cooperative learning model based on the Balinese patik application and the conventional learning model and the influence of these two models on students' motivation and learning outcomes in writing Balinese script.
2. Research subjects

   As an effort to obtain the necessary data sources for research, there are research subjects that need to be determined. Based on the research object above, the research subjects are teachers and all class x students at SMA Negeri 10 Denpasar which are then used as a population and a sample or class to be used as one of the data sources is determined.

Research data collection techniques

1. Documentation

   It is carried out by utilizing cameras to take and collect various documentation as evidence of the implementation of the learning process in experimental and control classes.
2. Test

   It was carried out in the form of a written test in the form of transcribing Latin sentences into Balinese script which aimed to collect data on student learning to write Balinese script before and after being given treatment, both in experimental classes and control classes. In the experimental class, students will carry out Balinese script writing activities by utilizing the Patik Bali application and the control class will write Balinese script on paper. The collected test results will be analyzed to find out any differences.
3. Questionnaire

   Questionnaires are a data collection technique by providing questions and statements that must be answered by respondents that allow researchers to study the behaviors, attitudes, beliefs, and characteristics of important individuals in the group that can be influenced by the current system or by the existing system.

Data Analysis Techniques

1. Bivariate normality test

   In bivariate normality testing, the normally distributed population is the data that must be prepared. This study uses *chi-square* plots from the chi-square distribution and the relationship between the distance of the anobis mahalanobis as an approach from univariate normal to show the bivariate normality of the data. The hypotheses tested in the normality test are as follows.

   H0 :d the motivation and learning outcomes of a normally distributed population Bivariate

   H1 :d motivation and learning outcomes from outside the distributed population Normal bivariat

   Testing to find out the correlation value of the distance costanobis with the values of the corresponding *chi-square* distribution can be carried out using the help of the spss program. H0 is accepted if there is a significant correlation of less than 0.05.

2. Variance-covariance matrix homogeneity test

   Test statistics are indispensable in testing the homogeneity of the variance-covariance matrix with the proposed hypothesis, namely $\boldsymbol{H_0} : \sum \mathbf{1} = \sum \mathbf{2}$ dan $\boldsymbol{H_0} : \sum \mathbf{1} \neq \sum \mathbf{2}$. Testing this hypothesis can use spss through the box's m test. This test aims to find out if the variance/covariance matrix of the variables is bound equally. According to Santoso et al. (2016) states that the matrix of bound variable variants will be the same if the significance in the box's m test is greater than 0.05.

3. Correlation test between variables

   The purpose of this test is to find out whether there is a high correlation or relationship between motivation and student learning outcomes in Balinese script writing material. If the results show that there is a low relationship, it means that there is no equal aspect measured in the variable, then it can be continued. This test will be carried out through the spss 25.0 for windows program. This test uses product moment correlation between other bound variables. Santoso (2016) Stating that the rule used to state whether or not there is a correlation between other bound variables is to make a comparison of the significance value that has been obtained with a significance level of 5%, if the significance value is lower than 5%, then H0 is rejected or it means that there is a correlation between the bound variable.

4. Uji hypothesis

   Based on the hypothesis proposed above, to perform quantitative hypothesis testing, multivariate variance analysis (manova) will be used with the help of the SPSS 25.0 for windows program. Statistical tests that can be used to test hypotheses are: (1) pillai's trace, (2) wilks' lambda, (3) hotelling's trace, and (4) roy's largest root. States that if the results of the analysis show that the f-values for the statistics of Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roy's Largest Root have a significance lower than 0.05 meaning that Ho is rejected.

The validity and reliability of the instruments in this study must be explicitly explained to ensure that the measuring instrument used can measure the construct in question precisely and consistently. The validity of the instrument, both for learning outcome tests and motivational questionnaires, needs to be tested through content validity by involving subject matter experts and educational practitioners to assess the representativeness of indicators to learning objectives and theoretical constructs. Furthermore, the empirical validity test was carried out by item-total correlation analysis using Pearson Product Moment, with the criterion that the item is declared valid if the significance value < 0.05. The reliability of the instrument is tested using Cronbach's Alpha coefficient, where the instrument is said to be reliable if the value $\alpha > 0.70$. For the visualization of the research design, a quasi-experimental design with *a non-equivalent control group design was used*, where two classes (experiment and control) were given a pretest and a posttest. The flow of analysis began with a prerequisite test (bivariate normality test and variance-covariance matrix homogeneity), followed by a correlation test between motivation variables and learning outcomes, and ended with a hypothesis test using MANOVA to see the influence of the learning model on two dependent variables simultaneously.

3. FINDINGS AND DISCUSSION

Result

1. Results of Research on Motivation and Learning Outcomes of Class X Students of SMA Negeri 10 Denpasar in Writing Balinese Script Due to the Influence of the Use of Conventional Learning Models
   a. Results of Research on the Motivation of Class X Students of SMA Negeri 10 Denpasar in Writing Balinese Script Due to the Influence of the Use of Conventional Learning Models

Table 1. Results of Study Motivation of Control Class Students

Statistics		
		Control Class Learning Motivation
N	Valid	36
	Missing	0
Mean		61.25
Std. Error Of Mean		.599
Median		61.00
Mode		57
Std. Deviation		3.597
Variance		12.936
Skewness		.167
Std. Error Of Skewness		.393
Kurtosis		-.959
Std. Error Of Kurtosis		.768
Range		14
Minimum		54
Maximum		68
Sum		2205

A. Multiple Modes Exist. The Smallest Value Is Shown

b. The Results of the Research on the Learning Outcomes of Class X Students of SMA Negeri 10 Denpasar in Writing the Balinese Script Due to the Influence of the Use of Conventional Learning Models

Table 2. Student Learning Outcomes of Control Class

Statistics		
		Control Class Learning Outcomes
N	Valid	36
	Missing	0
Mean		75.25
Std. Error Of Mean		1.028
Median		75.00
Mode		72
Std. Deviation		6.171
Variance		38.079
Skewness		-.453
Std. Error Of Skewness		.393
Kurtosis		.269
Std. Error Of Kurtosis		.768
Range		26
Minimum		58
Maximum		84

Sum	2709

A. Multiple Modes Exist. The Smallest Value Is Shown

2. The Results of the Research on the Motivation and Learning Outcomes of Class X Students of SMA Negeri 10 Denpasar in Writing the Balinese Script due to the Influence of the Use of the Stad-Type Cooperative Learning Model Based on the Patik Bali Application
   a. Results of Research on the Motivation of Class X Students of SMA Negeri 10 Denpasar in Writing Balinese Script Due to the Influence of the Use of the Stad-Type Cooperative Learning Model Based on the Patik Bali Application

Table 3. Results of Student Learning Motivation in Experimental Classes

Statistics		
		Motivasi Belajar Kelas Eksperimen
N	Valid	36
	Missing	0
Mean		72.78
Std. Error Of Mean		1.094
Median		73.00
Mode		70[a]
Std. Deviation		6.564
Variance		43.092
Skewness		.591
Std. Error Of Skewness		.393
Kurtosis		-.217
Std. Error Of Kurtosis		.768
Range		26
Minimum		63
Maximum		89
Sum		2620

A. Multiple Modes Exist. The Smallest Value Is Shown

   b. Results of Student Learning Motivation in Experimental Classes

Table 4. Experimental Class Student Learning Outcomes

Statistics		
		Experimental Class Learning Outcomes
N	Valid	36
	Missing	0
Mean		81.86
Std. Error Of Mean		1.074
Median		81.00
Mode		81
Std. Deviation		6.442
Variance		41.494
Skewness		-1.156

Std. Error Of Skewness	.393
Kurtosis	1.742
Std. Error Of Kurtosis	.768
Range	28
Minimum	63
Maximum	91
Sum	2947

A. Multiple Modes Exist. The Smallest Value Is Shown

c. The results of the study on the effect of the Stad type cooperative learning model based on the Patik Bali application on the motivation and learning outcomes of Balinese script writing students in class X of SMA Negeri 10 Denpasar.

1. Bivariate Normality Test

Table 5.
Results of Normality Test Analysis in Experiments and Control Classes

Correlations			
		Mahalanobis Distance	Q1_Kontrol
Mahalanobis Distance	Pearson Correlation	1	.824**
	Sig. (2-Tailed)		.000
	N	36	36
Q1_Kontrol	Pearson Correlation	.824**	1
	Sig. (2-Tailed)	.000	
	N	36	36
**. Correlation Is Significant At The 0.01 Level (2-Tailed).			

Correlations			
		Mahalanobis Distance	Q1_Eksperimen
Mahalanobis Distance	Pearson Correlation	1	.780**
	Sig. (2-Tailed)		.000
	N	36	36
Q1_Eksperimen	Pearson Correlation	.780**	1
	Sig. (2-Tailed)	.000	
	N	36	36

**. Correlation Is Significant At The 0.01 Level (2-Tailed).

2. Uji Homogenitas Matriks Varian/Kovarian

Table 6. Results of Variance/Covariance Matrix Test Analysis

Test Results		
Box's M		.774
F	Approx.	.255
	Df1	3
	Df2	35280.000

Sig.	.858
Tests Null Hypothesis Of Equal Population Covariance Matrices.	

3. Uji Correlation Between Bound Variables

Table 4.9
Analysis of Collinearity Test of Motivation and Student Learning Outcomes in Experimental Classes

Correlations

		Motivation to Study Experimental Classes	Experimental Class Learning Outcomes
Motivation to Study Experimental Classes	Pearson Correlation	1	.082
	Sig. (2-Tailed)		.635
	N	36	36
Experimental Class Learning Outcomes	Pearson Correlation	.082	1
	Sig. (2-Tailed)	.635	
	N	36	36

4. Uji Hipotesis

Table 8. Results of Analysis Using the Manova Test

Multivariate Tests

Effect		Value	F	Hypothesis Df	Error Df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.997	11444.051[b]	2.000	69.000	.000	.997
	Wilks' Lambda	.003	11444.051[b]	2.000	69.000	.000	.997
	Hotelling's Trace	331.712	11444.051[b]	2.000	69.000	.000	.997
	Roy's Largest Root	331.712	11444.051[b]	2.000	69.000	.000	.997
Modelbelajar	Pillai's Trace	.605	52.745[b]	2.000	69.000	.000	.605
	Wilks' Lambda	.395	52.745[b]	2.000	69.000	.000	.605
	Hotelling's Trace	1.529	52.745[b]	2.000	69.000	.000	.605
	Roy's Largest Root	1.529	52.745[b]	2.000	69.000	.000	.605

Discussion

Learning to write characters in schools until today continues to face various challenges in improving the quality of the process and learning outcomes. Every Balinese language teacher must be aware that students' competence in writing the Balinese script is still low. In addition, Balinese language teachers have a duty to help or guide students to be able to improve their competence in writing Balinese script. This is because there are many difficulties experienced by students that must be understood by teachers so that they are able to provide solutions in the form of learning motivation to students so that the learning results obtained show good results.

The learning outcomes obtained are closely related to how the learning process is carried out. Student learning motivation is an internal factor that is very important to optimize their learning outcomes because motivation consists of the desire to activate, move, channel, and direct students' learning attitudes and behaviors (Viirman, 2015; Tee et al., 2018; Shanmugam et al., 2019). Motivation in the learning process is a strength that arises from within students because there is a desire or enthusiasm to learn with strong effort. Low motivation of students will cause them to be less enthusiastic about learning and less interested in learning so that it will affect their learning outcomes. But on the contrary, with high motivation to learn, it refers to good learning outcomes.

Students' motivation to learn in writing Balinese script has a great influence on their learning outcomes in relation to the student learning process. This is due to the fact that if students have the motivation to learn attentively and focus on achieving learning goals, that will be demonstrated by the acquisition of good learning outcomes. Student learning motivation has a great influence on student learning outcomes. Students' success in learning is based on motivation that arises from within them (Bazelais et al., 2018; Demirel & Coşkun, 2010; Promraksa et al., 2014; Qian & Lehman, 2018). This means that high or low student learning outcomes in writing Balinese script depend on the level of motivation in the student himself in the learning process.

Based on the results of the analysis, it can be seen that the mean or average learning motivation score of students in the control class applied to the conventional learning model is 61.25 with a standard deviation of 3.597. Judging from the average student's learning motivation score So it can be stated to be included in the category of very sufficient. This shows that in general, students in the control class have sufficient learning motivation in learning to write Balinese script. Meanwhile, the *mean* score of student learning motivation in the experimental class applied to the stad-type cooperative learning model based on the Patik Bali application was 72.78 with a standard deviation of 6.564". Referring to the average learning motivation score of the student, it is in the high category. This shows that in general, students in the experimental class have a high level of learning motivation in learning to write Balinese script.

Based on the results of the analysis, it can be seen that the mean score of student learning outcomes in the control class applied by the conventional learning model is 75.25 with a standard deviation of 6.171. Referring to the average score of the student's learning outcomes, it falls into the good category. This shows that in general, students in the control class have good learning outcomes in learning to write Balinese scripts. Meanwhile, the *mean* score of student learning outcomes in the experimental class applied to the stad-type cooperative learning model based on the Patik Bali application was 81.86 with a standard deviation of 6.442. The average score of the student's learning outcomes is in the very good category. This shows that in general, students in the control class have very good learning outcomes in learning to write Balinese scripts.

The results of the analysis obtained showed that the significance value was 0.000. From the values listed in the significance obtained, it shows a number greater than 0.05. Thus, it can be concluded that there is a positive influence on the application of the stad-type cooperative learning model based on the Patik Bali application on the motivation and learning outcomes of writing Balinese script students in class X of SMA Negeri 10 Denpasar or h0 are rejected. This is in line with the Baafi & Atieno (2020) and Slavin (1983) showing positive results shown by an increase in learning achievement that exceeds

the set target, namely the average grade of 78.35 and learning completeness reaching a percentage of 79.4%.

This study is supported by showing a significant influence on experimental classes that apply a stad-type cooperative learning model with conventional learning in a control class about learning outcomes, social attitudes, and learning motivation. Other studies by (Yulandra & Pujiastuti, 2019) and (Pettersson et al., 2013) showed that there was a significant influence on the use of the Stad learning model assisted by plotagon media on the activeness and learning outcomes of class V students.

The results of this study show that the application of the STAD-type cooperative learning model based on the Patik Bali application significantly improves students' motivation and learning outcomes in writing Balinese script compared to the conventional model. These findings are in line with motivation theory which emphasizes that intrinsic motivation plays an important role in increasing learning participation and achievement (Deci & Ryan, 2008), and cooperative pedagogical theory which states that social interaction in small groups can improve understanding through the division of learning responsibilities (Kington et al., 2013). Nevertheless, critically it is worth noting that despite the positive results, some technical limitations still need to be noted. First, the relatively short duration of the intervention can limit students' long-term understanding of the material. Second, the use of the Patik Bali application may provide technological advantages that the control group does not have, so that the effect that appears is not only the result of cooperative methods, but also technological bias. In addition, a comparison with research that found that cooperative models without the help of technology did not consistently result in significant improvements showed that technology integration has an important mediating role in learning effectiveness (Liu, 2016).

4. CONCLUSION

Based on the results of this analysis, it shows that in general students in the control class have sufficient learning motivation in learning to write Balinese script. While students in the experimental class have high learning motivation in learning to write Balinese script. Based on the results of this analysis, it shows that in general students in the control class have learning outcomes that are categorized as good in learning to write Balinese script. While students in the control class have learning outcomes that are categorized as very good in learning to write Balinese script. The results of the analysis obtained show that the significance value is 0.000. Thus, it can be concluded that there is a positive influence on the application of the cooperative learning model type stad based on the patik bali application on the motivation and learning outcomes of writing Balinese script of class X students of SMA Negeri 10 Denpasar.

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