International Journal of Science and Applied Science: Conference Series P-ISSN: 2549-4635
Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) E-ISSN: 2549-4627
https://jurnal.uns.ac.id/ijsascs/ doi: 10.20961/ijsascs.v9i1.113276

The student teams achievement divisions (STAD) learning model and the role of digital media in the opinion-forming ability of students at SMAN 1 Negerikaton

Dwi Ratna Sari[1], Susanto[2], Widiyanto[3]

[1,2]Buddhist Education Department, Jinarakkhita Buddhist College of Lampung, Indonesia

[3]Buddhist Communication Science Department, Jinarakkhita Buddhist College of Lampung, Indonesia

Email: dwi.ratna.sari@sekha.kemenag.go.id

Abstract: Education today requires students to not only be proficient in academic knowledge, but also to have the ability to think critically and dare to express their opinions clearly, logically, systematically, rationally, and responsibly. Unfortunately, in learning practices, many students are still passive and less involved in classroom discussions. The ability to express opinions is an important aspect that can reflect the character of students who are active, confident, and communicative. This article presents the results of research on the influence of the Student Teams Achievement Divisions (STAD) learning model and the use of digital media (Quizizz) on improving students' ability to express their opinions. The study was conducted at SMAN 1 Negerikaton, involving 141 tenth-grade students out of a total population of 216 students, selected using the Proportionate Stratified Random Sampling technique. The instrument used was a closed-ended Likert scale questionnaire, and the data was analyzed using multiple linear regression. The results of this study indicate that the STAD model has a significant effect of 68.2%, and digital media such as Quizizz has an effect of 56.6% on students' opinion-forming abilities. Together, these two approaches contributed 73.9% to increasing student participation in expressing opinions. The combination of cooperative learning strategies and digital media not only encourages students to speak more actively but also increases social interaction, conceptual understanding, and student confidence. This proves that collaboratively designed technology-based learning can be an effective solution to overcome one-way and boring learning. Therefore, teachers and education practitioners are advised to make optimal use of this strategy in an effort to develop students who are critical thinkers, communicative, and ready to face the challenges of the 21st century.

Keywords: STAD, digital media, opinion-forming skills, collaborative learning

1. Introduction

Education plays an important role as a fundamental means of shaping the character, mindset, and life skills of students so that they are able to adapt to the dynamics of modern life. In the 21st century, one of the important competencies that students must have is the ability to think critically and communicate effectively. One indicator of the success of

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

these skills is the ability of students to express their opinions logically, structurally, and argumentatively [1]. The ability to express opinions not only reflects students' understanding of the material but also demonstrates independent thinking, confidence, and active participation in the learning process. According to [2], the ability to express opinions is an activity carried out by expressing ideas or conveying thoughts verbally. In addition, expressing opinions is a form of self-expression based on one's own knowledge and thoughts, which trains students to think critically and speak skillfully. Expressing opinions clearly can build rational arguments and respect for other people's views [3]. This skill is not only important in classroom discussions but also in everyday life, both in social and professional contexts.

One way to develop students' ability to express opinions is by using a variety of learning models. One of the learning models used to improve social skills and the ability to express opinions is the Student Teams Achievement Divisions (STAD) learning model [4]. Research related to the STAD model has shown positive results. According to Amelia, STAD is a cooperative learning model for heterogeneous grouping that involves team recognition and group responsibility for individual or member learning so that it can increase student learning activity [5]. Meanwhile, Sartika also argues that learning activities that apply STAD can increase learning activities and outcomes [6]. In addition, the use of the STAD method has been proven effective in improving students' reading skills [7]. A learning method is indicated to help the effectiveness of the teaching and learning process. In this case, media helps to maximize the learning methods used by teachers in explaining the material.

With the development of technology, learning media has experienced rapid growth, as evidenced by a survey conducted by the Indonesian Education and Teachers Association (P2GI) in November 2020, which revealed that 70% of teachers in Indonesia have used digital platforms to support teaching and learning activities. These technology-based learning media include various tools and digital platforms, which have brought about major changes in the way learning is conducted [8]. According to Setyawan, the use of digital media in education allows students to learn flexibly and more deeply. The use of Quizizz has also been proven to make learning activities more enjoyable, thereby improving student learning outcomes, as shown in research conducted by [9]. In this case, the STAD method and digital media are considered highly relevant, as digital media can be a tool that facilitates and enriches the collaborative process in the STAD model itself [10]. In Buddhism, this improvement in ability is in line with the Buddha's teachings in the Sikkhā Sutta (A.I.101), which states that every individual can develop their abilities through consistent practice and learning.

Based on national findings and data, Indonesian students' communication and opinion-forming skills are still relatively low. The 2018 Programme for International Student Assessment (PISA) report shows that Indonesian students' reading literacy skills, which form the basis of critical thinking and opinion-forming skills, are still below the OECD average.

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

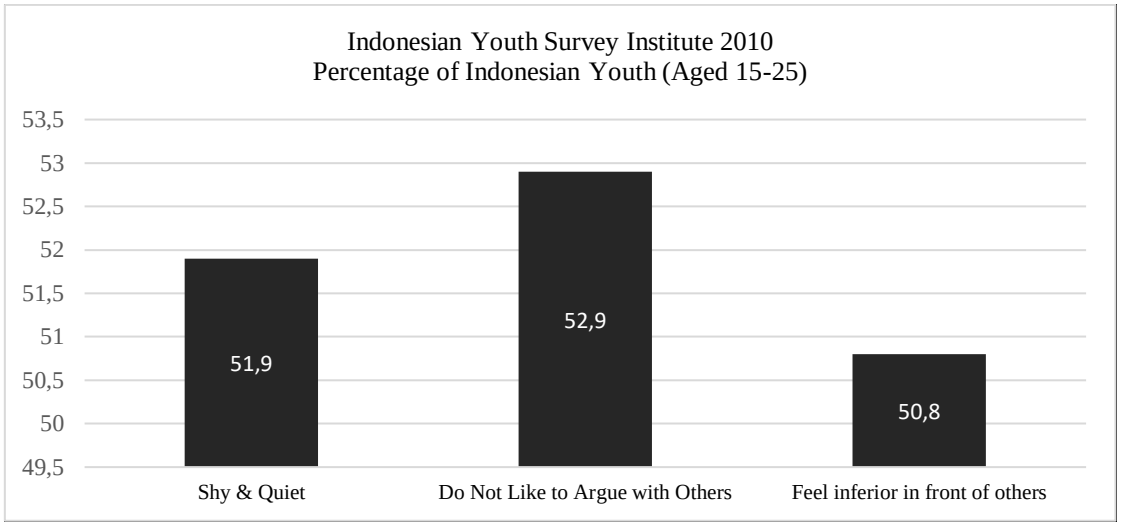

Figure 1.1 Results of the 2010 Indonesian Youth Survey Source: Goethe.de & ppig.org (Tirto.id)

The results of a survey conducted by the Indonesian Survey Institute in 2010 on Indonesian youth with 1,496 respondents, 95% significance, and a margin of error (± 2.6%) show that most Indonesian youth in this age range face challenges in terms of confidence in arguing and social interaction. The survey results noted that: 52.5% of young people did not like to argue with others, while 51.9% admitted to being shy and quiet, indicating a limitation in expressing themselves in social settings. Meanwhile, 50.8% of young people felt inferior in front of others, describing a lack of confidence when interacting. These findings illustrate the psychosocial condition of young people who tend to be passive in social interactions. This indicates challenges in developing effective communication skills in the classroom. One of the causes is the dominance of conventional teacher-centered learning, as well as the lack of open and collaborative discussion spaces among students.

Based on the results of observations and interviews conducted by researchers at SMAN 1 Negerikaton on March 10, 2025, it was found that in learning activities, teachers still actively use the STAD learning model by utilizing digital media (Quizizz). During these learning activities, the researcher directly observed the learning process and noted several things, namely that student participation was quite active in terms of interaction, but most students still tended to be passive in the learning process, especially when asked to express their opinions orally or in writing. Another problem identified was that students were not accustomed to expressing their opinions due to a lack of confidence, embarrassment about their abilities, fear of making mistakes, avoidance of eye contact with the teacher, and being accustomed to only receiving information without being encouraged to think reflectively. The teacher also did not fully implement a learning model that encouraged optimal interaction and collaboration among students.

In order to overcome these problems, a learning approach is needed that can create an interactive and enjoyable classroom atmosphere and encourage active student participation. One solution offered is the application of the Student Teams Achievement Divisions (STAD) learning model, which is a cooperative learning model that provides

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

opportunities for students to discuss in small groups, help each other, and be responsible for mutual understanding. In addition, the use of digital media such as Quizizz, Google Forms, or other digital platforms is considered capable of increasing student motivation and engagement in learning. The combination of STAD and digital media is believed to strengthen the learning process and improve students' ability to express their opinions. The focus of this research is to discuss in more depth the implementation of the STAD learning model and the use of Quizizz-based digital technology on students' ability to express their opinions, so that the scope of the discussion will be clearer and more specific. In this case, Buddha explains in the Vāca Sutta that:

"Bhikkhus, with these five factors, a speech is well-spoken, not ill-spoken; it is not blameworthy and beyond reproach by the wise. What are these five? The speech is spoken at the right time; what is said is true; the speech is spoken gently; what is said is beneficial; the speech is spoken with a loving mind., with these five factors, a speech is spoken well, not badly; it is not blameworthy and beyond reproach by the wise" [11]

From the above quotation, it can be concluded that the ability to express opinions well does not only depend on the content of what is conveyed, but also on the manner, timing, and intention in conveying it. The five factors mentioned, namely speaking at the right time, conveying the truth, using gentle words, conveying useful things, and being accompanied by thoughts of love, reflect the principles of wise and ethical communication.

Research conducted by Arifin states that the application of the Student Team Achievement Division (STAD) cooperative learning model provides slightly higher average learning outcomes compared to conventional methods [12]. Meanwhile, Wardani found that the use of the Team Games Tournament method and Quizizz media showed an increase from initially only 46% of students who had language comprehension and skills to an increase to 87% [13]. This is certainly in line with the research to be conducted. Considering the gaps in previous research and the findings from initial observations and the above review, the researcher is interested in examining more deeply how the Student Teams Achievement Divisions STAD learning model and the role of digital media can improve the opinion forming abilities of students at SMAN 1 Negerikaton. Although the STAD method has been quite effective in helping to create good interactions between students, the researcher feels that there is greater potential if, in the learning process, students are provided with more supportive tools to express their opinions with more confidence. Digital media such as Quizizz can be used as a fun learning tool that allows students to learn and express their opinions more openly [14]. Therefore, the STAD learning model with the help of Quizizz digital media is expected to be able to improve students' ability to express their opinions as it should be. Therefore, the purpose of this study is to determine whether there is an effect of the application of the STAD learning model and the role of digital media on students' ability to express their opinions.

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

2. Research Method

This study used a quantitative approach with a survey method to obtain information from a number of respondents through questionnaires or structured interviews, with the aim of measuring certain variables statistically. This study is based on a positivistic paradigm, which focuses on testing theories through empirical data. Through this design, it is hoped that clearer insights can be obtained regarding the relationship between variables and their impact in the context of research [15]. The purpose of quantitative research is to test theories, show the influence between variables, and make predictions. This study uses a quantitative approach design with a survey method to test the relationship between independent variables (X1: STAD Learning Model, X2: Role of Digital Media) and dependent variables (Y: Ability to Express Opinions). This design aims to determine the extent of the influence of variables X1 and X2 on Y through statistical analysis techniques [16].

The steps in this research design include gathering preliminary information related to the research topic, conducting a preliminary study or background analysis of the problem, identifying and formulating the problem based on the problem constraints that have been identified, conducting a relevant theoretical review, designing the methodology, and making decisions. This is followed by identifying variables, compiling instrument grids, collecting data through questionnaires or instrument trials, and analyzing data by testing the instruments using statistical methods. After obtaining valid and reliable instruments, the next stage is to distribute the instruments to the sample for analysis. The final stage is to present the analysis results for discussion and to draw conclusions and recommendations. These are the series of steps or stages used in research design to ensure the accuracy and relevance of the research.

The population in this study consisted of 216 tenth-grade students with a sample size of 141 students obtained through the Slovin formula using the Proportionate Stratified Random Sampling technique, which allowed researchers to divide the population into heterogeneous levels based on certain characteristics and take samples proportionally from each class to ensure that all subgroups were represented. Data were collected through interviews with teachers and students, documentation in the form of pictures of teaching and learning activities, and instruments in the form of closed questionnaires with a Likert scale, which had been validated by subject matter experts and language experts before being distributed. This instrument consisted of three main parts, namely: statements measuring students' perceptions of the application of the STAD learning model, statements regarding the use of digital media in learning, and statements related to students' ability to express their opinions. Next is the data analysis method applied in this study, namely multiple linear regression analysis. To obtain more accurate and reliable analysis results, this study used data analysis assisted by statistical software, namely Statistical Product and Service Solution (SPSS) version 27.0. The use of SPSS aims to provide an in-depth understanding of the relationship between the variables observed in the study.

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

3. Results

After going through the data collection and analysis process, the results of this study provide a clear picture of the effect of the Student Teams Achievement Divisions (STAD) learning model and the use of digital media on students' ability to express their opinions. The findings not only reinforce the initial hypothesis but also provide new insights into the importance of a collaborative learning approach integrated with technology. This section will present the research results in detail, followed by a discussion linking these findings to previous theories and research results. Thus, it is hoped that readers can comprehensively understand how these two variables play a role in creating a more active, participatory, and effective learning atmosphere in developing students' communication skills. The results are as follows:

Table 3.1 Instrument Reliability Test Results

Reliability Statistics	
Cronbach's Alpha X1, X2, Y	Number of Items
876	82

Source: Data analysis in 2025 using SPSS 27

Based on the reliability test results presented in Table 3.1, Cronbach's alpha value was obtained at 0.876 for 82 items tested on variables X1 (STAD Learning Model), X2 (Role of Digital Media), and Y (Ability to Express Opinions). This value indicates that the research instrument used has good reliability, because the significance value is > 0.70. Thus, it can be concluded that this instrument is consistent in measuring the variables in question and can be trusted for use in further research.

The next stage is the normality test. In this study, IBM SPSS 27 software was used with the One Sample Kolmogrov Smirnov test, with a significance level of Alpha 5% or 0.05. $H_0$is rejected if Asymp. Sig ≤ 5%. A significance level of Alpha 5% or 0.05 means that the research decision takes a 5% risk of rejecting the correct hypothesis and is at least 95% correct in making the decision. The smaller the error rate, the better the research. The normality assumption check below shows that the data distribution is suitable for parametric analysis (p > 0.05), so that the linear regression test can be continued without transformation. This ensures the validity of the statistical inferences produced.

Table 3.2 Instrument Reliability Test Results

One-Sample Kolmogorov-Smirnov Test				
		STAD Learning Model	Role of Digital Media	Opinion-forming Ability
N		141	141	141
Normal Parameters[a,b]	Mean	106.67	98.91	106.69
	Standard Deviation	7.103	7.011	7.102
Most Extreme Differences	Absolute	.063	.068	.064
	Positive	.063	.068	.064

One-Sample Kolmogorov-Smirnov Test			
Negative	-.053	-.068	-.051
Test Statistic	.063	.068	.064
Asymp. Sig. (2-tailed)[c]	.200[d]	.200[d]	.200[d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Source: Data processing in 2025 using SPSS 27

Before entering regression analysis, a prerequisite test was first conducted to ensure that the data used met the basic statistical assumptions. One of the prerequisite tests conducted was a homogeneity of variance test, which aimed to determine whether the data from the variables studied had uniform variance. The homogeneity test was performed as a requirement in the independent sample test analysis using the Compare Means One Way ANOVA method. The underlying assumption in the analysis (ANOVA) is that the variances of the population are the same. The test criterion is that if it is greater than 0.05 or 5%, then it can be said that the variances of the three data groups are the same.

Table 3.3 Results of Data Variation Level Test

Tests of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Variables X1, X2, Y	Based on Mean	.037	2	420	.964
	Based on Median	.042	2	420	.959
	Based on Median and with adjusted df	.042	2	418.020	.959
	Based on trimmed mean	.036	2	420	.964

Source: Data analysis in 2025 using SPSS 27

The homogeneity test results show that the significance value of the STAD Learning Model (X1), Role of Digital Media (X2), and Opinion-Making Ability (Y) variables is 0.964. Since this significance value is greater than the alpha limit (0.05), it can be concluded that the three data groups have homogeneous variance. Thus, the data meets the homogeneity requirement and can proceed to the next stage of analysis.

Next, a linearity test was conducted to ensure that the relationship between the independent and dependent variables was linear, in accordance with the basic assumptions in linear regression analysis. This test was performed using the ANOVA table, and to interpret it, the following hypothesis formulation was required: H_0 states that there is a linear regression relationship, while H_1 states that the relationship is nonlinear. The basis for decision making is the significance value in the Deviation from Linearity section. If the significance value is greater than 0.05, then H_0 is accepted, which means that the relationship between the variables is linear. The results obtained show that the

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

Deviation from Linearity significance value meets these criteria, so it can be concluded that the regression model in this study has a linear relationship pattern. This finding strengthens the validity of the model used to measure the influence of STAD and digital media on students' ability to express their opinions. The results can be seen in the table below:

Table 3.4 Results of the Linearity Test of Opinion Expression Ability and the STAD Model

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Opinion-forming Ability * STAD Learning Model	Between Groups	(Combined)	7057.781	32	220,556	5,306,438	.000
		Linearity	7,057.335	1	7,057.335	169,795.278	.000
		Deviation from Linearity	.446	31	.014	.346	.999
	Within Groups		4,489	108	.042		
	Total		7,062,270	140			

Source: Data analysis for 2025 using SPSS 27

Table 3.5 Results of Linearity Test of Opinion-Making Ability and the Role of Digital Media

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Opinion-forming Ability * STAD Learning Model	Between Groups	(Combined)	4906.163	34	144,299	7,094	.000
		Linearity	3998.431	1	3998.431	196,574	.000
		Deviation from Linearity	907,732	33	27,507	1,352	.127
	Within Groups		2,156.106	106	20,341		
	Total		7,062.270	140			

Source: Data analysis for 2025 using SPSS 27

Based on the analysis results in the table above, the regression model between the STAD learning model variable and the role of digital media on opinion-forming ability can be said to be linear. This is indicated by the significance value in Deviation from Linearity being greater than 0.05, namely 0.999 for the STAD learning model and 0.127 for the role of digital media. This means that the relationship between the two independent variables and opinion-forming ability is linear, so the regression model used in this study can be considered valid for measuring the influence of each variable.

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

Table 3. 6 Multicollinearity Test Results

Coefficients[a]							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	-5.548	2.677		-2.072	.040		
STAD Learning Model	.982	.037	.914	26,250	.000	.433	2,311
The Role of Digital Media	.060	.032	.064	1,844	.047	.433	2,311
a. Dependent Variable: Ability to Express Opinions							

Source: Data analysis for 2025 using SPSS 27

Based on the results of the multicollinearity test shown in Table 3.6, it is known that the Tolerance value for both independent variables, namely the STAD Learning Model and the Role of Digital Media, is 0.433, while the VIF value is 2.311. Referring to the general criteria in multicollinearity testing, a model is said to be free of multicollinearity if the Tolerance value is greater than 0.10 and the VIF value is less than 10. With both criteria met, it can be concluded that there is no indication of multicollinearity in this model. This means that the STAD Learning Model and the Role of Digital Media are independent variables and do not have a strong linear relationship with each other. This condition shows that both variables can be analyzed simultaneously in a regression model without disturbing the validity of the analysis results, so that the interpretation of the influence of each variable on the ability to express opinions can be done more accurately.

This study tested for heteroscedasticity to determine whether there was variance (variation) in the residual values from one observation to another in the regression model. The basis for decision making in the heteroscedasticity test is that if the significance value is > 0.05, it can be concluded that there is no heteroscedasticity problem. Conversely, if the significance value is < 0.05, it can be concluded that there is a heteroscedasticity problem.

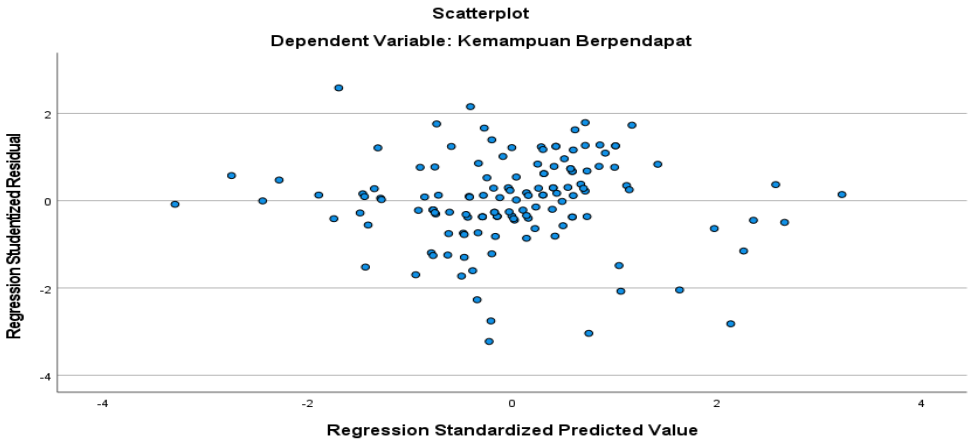

Figure 3.1 Scatterplot Source: Data processing in 2025 using SPSS 27

Based on the results of the heteroscedasticity test conducted using SPSS 27, it was found that there were no signs of heteroscedasticity in the regression model used. This is indicated by the pattern of the points on the scatterplot graph, which are scattered randomly and do not form a specific pattern. This pattern of distribution indicates that the residual variance is constant or homoscedastic. Thus, the classical assumption regarding the existence of constant residual variance has been fulfilled. This condition strengthens the validity and reliability of the regression model, because the analysis results are not biased due to uneven error variance. Therefore, the regression model used in this study is declared feasible for use in testing the relationship between the variables studied.

Furthermore, hypothesis testing was conducted to determine whether the hypotheses stated in this study could be accepted or rejected. The influence of the independent variables STAD Learning Model (X1) and the Role of Digital Media (X2) on Opinion-Making Ability (Y), both individually and collectively, was the hypothesis tested in this study. To determine whether there is an effect of the STAD learning model on students' opinion-forming ability, multiple linear regression analysis was performed. This analysis aims to test the effect of the independent variable (X1) on the dependent variable (Y) partially. The following presents the regression test results based on the Coefficients table, which shows the coefficient values, t values, and significance of each variable:

Table 3.7 Coefficients of the STAD Learning Model and Opinion-Making Ability

Coefficients[a]					
		Unstandardized Coefficients	Standardized Coefficients		
Model		B	Standard Error	Beta	t	Sig.
1	(Constant)	-5.548	2.677		-2.072	.040
	STAD Learning Model	.982	.037	.914	26,250	.000
	The Role of Digital Media	.060	.032	.064	1,844	.047

a. Dependent Variable: Ability to Express Opinions

Source: Data processing in 2025 using SPSS 27

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

Table 3. 8 Correlation Analysis of X1 and X2 on Y

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6551.059	2	3,275.529	884,220	.000[b]
	Residual	511,211	138	3,704		
	Total	7,062,270	140			

a. Dependent Variable: Ability to Express Opinions

b. Predictors: (Constant), Role of Digital Media, STAD Learning Model

Source: Data processing in 2025 using SPSS 27

Based on the results of the statistical analysis conducted, it is known that both the STAD learning model and the role of digital media have a positive and significant effect on the opinion-forming ability of students at SMAN 1 Negerikaton. This can be seen from the t-count value of each variable, which is greater than the t-table (STAD: 26.250 > 0.197 and digital media: 1.844 > 0.197) and the significance level that meets the requirements (< 0.05), which means that the null hypothesis is rejected and the alternative hypothesis is accepted. In addition, simultaneous testing using F analysis also showed very significant results, where Fcount was 884.220, far exceeding Ftable of 3.06. These findings reinforce the conclusion that, together, the STAD learning model and the role of digital media contribute significantly to improving students' ability to express their opinions. Thus, it can be concluded that a collaborative learning approach and the use of digital media can create a more effective learning environment for developing students' communication and critical thinking skills.

To understand the extent of the influence of independent variables on dependent variables in this study, a coefficient of determination (R^2) analysis was conducted. This analysis aimed to determine the contribution of the Student Teams Achievement Divisions (STAD) learning model and the use of digital media in explaining variations in students' ability to express their opinions. The coefficient of determination value provides an overview of the extent to which the model used is able to predict or explain the phenomenon being studied. The results of this analysis are presented in tabular form to facilitate data reading and interpretation. The coefficient of determination (R^2) values can be seen in detail in the following table:

Table 3. 9 Results of the Determination Test of the STAD Learning Model and Opinion-Making Ability (R2)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.827[a]	.682	.672	9.462

a. Predictors: (Constant), STAD Learning Model

b. Dependent Variable: Ability to Express Opinions

Source: Data processing in 2025 using SPSS 27

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

Table 3.10 Results of the Determination Test on the Role of Digital Media and Opinion-Forming Ability (R^2)

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.752[a]	.566	.563	4.695

a. Predictors: (Constant), Role of Digital Media
b. Dependent Variable: Ability to Express Opinions

Source: Data analysis in 2025 using SPSS 27

Table 3.11 Results of the Determination Test for the STAD Learning Model, the Role of Digital Media, and Opinion-Forming Ability (R^2)

Model Summary[b]				
Model	R	R Square	Adjusted R-Squared	Standard Error of the Estimate
1	.863[a]	.739	.733	8.425

a. Predictors: (Constant), Role of Digital Media, STAD Learning Model
b. Dependent Variable: Ability to Express Opinions

Source: Data analysis in 2025 using SPSS 27

Based on the results of the analysis of the coefficient of determination (R Square), it can be seen that both the STAD learning model and the role of digital media contribute significantly to students' opinion-forming ability. In detail, the STAD learning model is able to explain 68.2% of the opinion-forming ability variable, while the role of digital media contributes 56.6%. When these two variables are combined in one model, the effect increases to 73.9%. This means that the combination of the STAD learning model and the role of digital media has a stronger effect in explaining the variation in students' opinion-forming ability than if each stood alone. The remaining 26.1% is the contribution of other factors outside this study that also influence students' opinion-forming ability. These findings emphasize that collaborative learning strategies such as STAD and digital media support can significantly increase student participation and critical thinking skills in expressing their opinions in the learning environment.

4. Discussion

Based on the findings and analysis above, the STAD learning model and the role of digital media generally have a positive impact on the opinion-forming abilities of students at SMAN 1 Negerikaton. The results of the study show a positive relationship between the STAD learning model and the ability to express opinions. This means that someone who is able to take responsibility and work well in a team will certainly have good interpersonal communication skills and the courage to convey their ideas or opinions in public. The STAD learning model contributes significantly to improving students' ability to express their opinions or arguments. The STAD model focuses on group work, individual responsibility, and discussion among team members, which can effectively encourage students to participate more actively, express their opinions, and develop

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

critical thinking and interpersonal communication skills. This model is also in line with Buddhist teachings, which reflect the concepts taught by Buddha in the Mahāparinibbāna Sutta, where Buddha said:

"Perhaps, monks, you do not ask out of respect for the Teacher. If so, monks, please let one person convey it to another..." [17]

The above quote shows that the Buddha encouraged open communication and discussion within the monastic community *(sangha*) to achieve a deeper understanding. Discussion and mutual clarification are considered important in learning and problem solving in the Buddhist community, so this is in line with the STAD learning model which focuses on cooperation and discussion.

The relationship between the STAD learning model and the ability to express opinions can be seen from the correlation test results, which show that the Student Team Achievement Division (STAD) cooperative learning model has a strong relationship with students' ability to express opinions, with a determination value of 0.682. This figure shows that 68.2% of the variation in students' ability to express opinions can be explained by the application of the STAD learning model, while the remaining 31.8% is influenced by other factors outside the learning model. This indicates that STAD as a cooperative learning approach is capable of creating a learning atmosphere that supports the development of students' critical thinking and communication skills, especially through group discussion activities and individual responsibility in conveying the results of their thoughts.

[18] proved that the application of the STAD learning model is effective in improving student learning outcomes, especially in the thematic lesson on Human Growth and Development. Meanwhile, [19] showed that the application of the STAD model combined with digital learning media significantly improved the critical thinking skills of high school students, demonstrating the synergy between cooperative methods and learning technology. In Buddhism, the Majjhima Nikaya[20] emphasizes the importance of thinking and speaking correctly in developing wisdom. This is in line with the objectives of the STAD model, which focuses not only on academic achievement but also on strengthening communication skills and deep understanding. Thus, learning that involves cooperation, discussion, and sharing ideas can be part of a more meaningful educational process that is in line with Buddhist values.

In this era of rapid digital transformation, digital media has become an integral part of the learning process in schools. The presence of Quizizz as an online learning platform not only facilitates student access to material, but also creates a new space for interaction, discussion, and expression of opinions. At SMAN 1 Negerikaton, the use of Quizizz has been proven to have a positive influence on students' ability to express their opinions. Through Quizizz*,* students have the opportunity to express their ideas more freely, both in writing and orally, in a supportive environment. This has resulted in increased courage, confidence, and ability among students to compose and convey arguments logically and structurally. Therefore, the role of digital media is one of the important factors that contribute to the development of students' communication skills in a modern and inclusive learning environment.

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276

The relationship between the role of Quizizz digital media and students' ability to express their opinions can be seen from the correlation test results, which show a determination value of 0.566. These results indicate that the use *of* Quizizz contributes 56.6% to the improvement of students' ability to express their opinions, while the other 43.4% is influenced by factors other than the use *of* Quizizz. This determination test indicates that more than half of the variation in students' opinion-forming abilities can be explained by the use of this digital media. This finding is in line with research conducted by Wardana et al. (2022), which states that the use of the Team Games Tournament (TGT) method combined with Quizizz media can improve students' language comprehension and proficiency from 46% to 87%. This confirms that interactive digital media such as Quizizz can create a fun and competitive learning atmosphere, encouraging students to participate more actively, be more confident, and express their opinions better. By providing immediate feedback and encouraging dynamic interaction, Quizizz plays an important role in building a learning environment that supports the effective development of students' communication skills.

This is also in line with the teachings of Buddhism as outlined in the Tevijja Sutta [17], which discusses how openness in thoughtful discussion can lead to deeper understanding and emphasizes the importance of openness in listening and speaking wisely in a discussion, which in turn can lead to deeper understanding and wisdom. In the context of learning, especially through digital media, this teaching reminds us that to truly understand the material or topic being discussed, students need to participate actively and openly in discussions, while controlling themselves with attentiveness and ethics. Thus, digital learning media that facilitate interaction and collaboration among students provide opportunities to develop self-control, critical thinking skills, and greater wisdom.

The results of this study indicate that the application of the Student Teams Achievement Divisions (STAD) learning model combined with the use of digital media (Quizizz) has a significant effect on improving students' argumentation skills at SMAN 1 Negerikaton. The magnitude of the influence of these two variables was recorded at 73.9%, indicating that technology-based collaborative learning strategies have a dominant contribution in shaping students' critical and argumentative thinking skills. The remaining 26.1% is estimated to come from other factors outside the scope of this study, such as student background, individual learning motivation, family role, or social environment, which can be the direction for further study in subsequent research. Previous studies have shown that the STAD learning model assisted by digital media, particularly Quizizz, significantly improves student learning outcomes, motivation, and engagement in learning. Research conducted by Mapala and Firdaus states that STAD can increase student activity and concept understanding [21], [22], while research by Khoirul and Fadilah focuses on how the integration of Quizizz in STAD can improve academic outcomes and a more interactive learning experience [23], [24].

These findings are also in line with Buddhist teachings, namely in the Kālāma Sutta, which provides the basic principles of scientific thinking, namely: not accepting an opinion simply because it comes from a certain tradition or authority, not swallowing

information whole simply because many people believe it, using common sense, direct experience, and consideration of benefits before concluding something.

"Mā anussavena, mā paramparāya, mā itikirāya, mā piṭakasampadānena, mā takkahetu, mā nayahetu, mā ākāraparivitakkena, mā diṭṭhinijjhānakkhantiyā, mā bhabbarūpatāya, mā samaṇo no garūti " [25].

This means: Do not believe simply because you have heard it, do not believe because of tradition, do not believe because of rumors, do not believe because of the contents of sacred texts, do not believe because of logic alone, do not believe because of deduction, do not believe because of speculative reasoning, do not believe because it seems reasonable, do not believe because it agrees with your personal views, and do not believe because he is a teacher or respected figure. Thus, the integration of technology-based collaborative learning strategies in education is not only pedagogically effective, but also supports Buddhist values of freedom of thought, wisdom based on experience, and the courage to express opinions correctly and responsibly.

5. Conclusion

Based on the results of data analysis and discussion, it can be concluded that all the objectives of this study were well achieved. First, the Student Teams Achievement Divisions (STAD) learning model was proven to have a positive and significant effect on improving students' ability to express their opinions. The collaborative approach in STAD encourages students to be more actively involved in the learning process, fosters courage in expressing ideas, and shapes critical thinking and responsibility in presenting arguments logically. Second, the use of digital media such as Quizizz also shows a significant influence in supporting an interactive, enjoyable, and motivating learning process. This media helps create a dynamic learning atmosphere, which in turn encourages students to be more confident in expressing their opinions. Third, when the STAD model and digital media are used together, they show strong synergy, creating a more effective, collaborative, and participatory learning process. The integration of the two not only improves individual opinion-forming skills but also strengthens social engagement and communication among students in learning activities. These findings are in line with the Buddhist teachings that emphasize the importance of sammā vāca (right speech), yoniso manasikāra (wise contemplation), and kalyānamitta (good association) as the foundation for thinking, speaking, and interacting with full awareness. In the context of education, these values teach the importance of expressing opinions wisely, without causing harm, and in a way that builds mutual understanding.

Thus, the three research objectives were not only comprehensively answered, but also showed that the application of technology-based collaborative learning strategies, such as STAD and digital media, is in line with Buddhist educational values that emphasize the development of wisdom (paññā), ethical communication, and harmonious togetherness in the learning process. This reinforces the relevance of modern learning approaches that remain grounded in spiritual and ethical values, in order to shape students who are intellectually capable and emotionally and morally mature.

6. Recommendations

The results of this study indicate that the STAD learning model and the use of the Quizizz platform are effective in improving students' ability to express their opinions. Therefore, it is recommended that further research explore the effectiveness of both in other levels or subjects, as well as consider psychosocial variables such as self-confidence and anxiety when speaking. The use of mixed methods (qualitative and quantitative) can also provide more comprehensive results. In addition, it is important to develop more interactive and adaptive digital media to accommodate the diverse characteristics of students. With these steps, further research is expected to provide more in-depth and relevant contributions to the development of argumentation skills and learning strategies in the digital age.

References

[1] Abidin, G. K. (2021). Penerapan Pembelajaran Daring Dengan Menggunakan Model STAD Berbantuan Media Quizizz.

[2] Al Firdaus, M. R. F., Sukidin, S., & Hartanto, W. (2022). Student Team Achievement Division (STAD) Cooperative Type Model Supported by Quizizz on Learning Outcomes. JINOTEP, 9(3). https://doi.org/10.17977/um031v9i32022p262

[3] Amelia, E., Attalina, S. N. C., & Widiyono, A. (2022). Pengaruh Model Kooperatif Tipe Stad Berbantuan Media Manipulatif Terhadap Hasil Belajar Siswa di Sekolah Dasar. Jurnal Pendidikan Dan Konseling, 4(3).

[4] Arifin, N. R. (2018). Pengaruh Model Pembelajaran Kooperatif Tipe STAD Terhadap Kemampuan Berpikir Kritis Siswa. Jurnal Edukasi (Ekonomi, Pendidikan Dan Akuntansi), 6(1). https://doi.org/10.25157/je.v6i1.1701

[5] Arsyad, A. (2007). Media Pembelajaran. RajaGrafindo.

[6] Bodhi, B. (Trans.). (2025a). The Numerical Discourses of the Buddha (Aṅguttara Nikāya) Vol. I. Wisdom Publications / DhammaCitta Press. http://dhammacitta.org

[7] Bodhi, B. (Trans.). (2025b). The Numerical Discourses of the Buddha (Aṅguttara Nikāya).Vol.III. Wisdom Publications / DhammaCitta Press. http://dhammacitta.org

[8] Fadilah, I. (2024). Pengaruh Model Pembelajar Kooperatif Tipe STAD (Student Teams Achievement Division).

[9] Karmila, R. D., Prabawa, A. H., & Susiati, S. (2023). Implementasi Metode STAD dalam Meningkatkan Kemampuan Membaca Siswa Sekolah Dasar. Buletin Pengembangan Perangkat Pembelajaran, 5(1). https://doi.org/10.23917/bppp.v5i1.22935

[10] Kasuma, Y. (2023). Upaya Meningkatkan Hasil Belajar Siswa SD... Jurnal Basicedu, 7(5). https://doi.org/10.31004/basicedu.v7i5.6123

[11] Laksana, S. D. (2021). Pentingnya Pendidikan Karakter Dalam Menghadapi Teknologi Pendidikan Abad 21. Jurnal Teknologi Pembelajaran, 1(01).

https://doi.org/10.25217/jtep.v1i01.1289

[12] Majjhima Nikāya. (n.d.). DhammaCitta Press. http://dhammacitta.org

[13] Mallappa, M., Rangappa, P., Jacob, I., Thimmegowda, L., & Rao, K. (2023). Quad Fever after Acute Traumatic Spinal Cord Injury. Journal of Clinical And Diagnostic Research. https://doi.org/10.7860/jcdr/2023/59699.17539

[14] Muhson, A. (2010). Pengembangan Media Pembelajaran Berbasis Teknologi Informasi. Jurnal Pendidikan Akuntansi Indonesia, 8(2). https://doi.org/10.21831/jpai.v8i2.949

[15] Nanda, S. (2022). Metode Penelitian Kuantitatif. http://n/A

[16] Nikmah, E. H., Fatchan, A., & Wirahayu, Y. A. (2015). Model Pembelajaran STAD, Keaktifan dan Hasil Belajar Siswa. Jurnal Pendidikan Geografi, 5(3).

[17] Pramesthi, H. K., & Prasetyo, B. D. (2023). Pengaruh Terpaan Iklan Televisi terhadap Brand Awareness. Jurnal Ilmu Komunikasi UHO, 8(1). https://doi.org/10.52423/jikuho.v8i1.16

[18] Prameswari, S. W., Suharno, S., & Sarwanto, S. (2018). Inculcate Critical Thinking Skills in Primary Schools. SHEs Conference Series, 1(1). https://doi.org/10.20961/shes.v1i1.23648

[19] Pratama, W., & Jufri, W. N. (2023). Penerapan Model Pebelajaran Tipe STAD (Student Teams Achievement Division) Untuk Meningkatkan Hasil Belajar pada Mata Pelajaran Estimasi Biaya Konstruksi (EBK). Jurnal Applied Science in Civil Engineering, 4(3), 287–293. https://doi.org/10.24036/asce.v4i3.68383

[20] Sartika, T. (2023). Penerapan Model Pembelajaran Stad Melalui Media Pembelajaran Komik pada Pembelajaran Bahasa Inggris untuk Meningkatkan Keterampilan Menulis Peserta Didik. Intelektium, 4(1). https://doi.org/10.37010/int.v4i1.1207

[21] Sitorus, D. S., & Santoso, T. N. B. (2022). Pemanfaatan Quizizz Sebagai Media Pembelajaran Berbasis Game Pada Masa Pandemi Covid-19. Scholaria: Jurnal Pendidikan Dan Kebudayaan, 12(2). https://doi.org/10.24246/j.js.2022.v12.i2.p81-88

[22] Vitasari, D. A. (2012). Pengaruh Pola Asuh Demokratis Orang Tua terhadap Kemampuan Mengemukakan Pendapat Anak di Dusun Losari Randusari Argomulyo Cangkringan Sleman.

[23] Walshe, M. (Trans.). (1995). The Long Discourses of the Buddha (Dīgha Nikāya) Vol. II. DhammaCitta Press.

[24] Wardana, M. A. W., Saddhono, K., & Rakhmawati, A. (2022). Peningkatan Pemerolehan dan Pembelajaran Bahasa pada Siswa Disleksia... JDMP (Jurnal Dinamika Manajemen Pendidikan), 7(1). https://doi.org/10.26740/jdmp.v7n1.p71-82

[25] Zahwa, F. A., & Syafi'i, I. (2022). Pemilihan Pengembangan Media Pembelajaran Berbasis Teknologi Informasi. Equilibrium, 19(01). https://doi.org/10.25134/equi.v19i01.3963

Int. J. Sci. Appl. Sci.: Conf. Ser., Vol. 9 No. 1 (2025) doi: 10.20961/ijsascs.v9i1.113276