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THE EFFECT OF THE JIGSAW COOPERATIVE LEARNING MODEL ASSISTED BY WORDWALL MEDIA ON MOTIVATION AND SCIENCE LEARNING OUTCOMES IN FOURTH-GRADE

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ABSTRAK

Low motivation and learning outcomes of students in Natural and Social Sciences (IPAS) remain a major problem in elementary school learning. The learning process, which tends to be one-way and does not actively involve students, causes a decline in participation and enthusiasm for learning. Based on this, this study aims to determine the effect of applying the Jigsaw cooperative learning model assisted by Wordwall media on the motivation and learning outcomes of fourth-grade students. This study used a one-group pretest-posttest design with 26 students as subjects. The research instruments included observation sheets of teacher and student activities, learning motivation questionnaires, and learning outcome tests. The data were analyzed using validity, reliability, normality, and paired sample t-test. The results showed that the application of the Jigsaw cooperative learning model assisted by Wordwall media could significantly improve student motivation and learning outcomes. Students showed higher motivation categories and increased average learning outcome scores after the application of this model. Thus, the Jigsaw learning model assisted by Wordwall proved to be effective in improving student motivation and learning outcomes in IPAS subjects.

1. INTRODUCTION

Education plays a strategic role in optimizing individual potential so that individuals can make a significant contribution to society and build a brighter future. Education is a process designed to develop knowledge, skills, and moral values that are beneficial to individuals, society, the nation, the state, and religion.

This is in accordance with the principles of education in Law No. 20 of 2003 concerning the National Education System. Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and the skills needed by themselves, society, the

nation, and the state. The importance of education for society cannot be ignored because it plays a role in social change (UUD No. 20, 2003).

Education plays a very important role in human life and progress. Education will produce quality human resources. Through education, a nation can stand alone, be resilient and highly competitive so that a young generation will be formed who are devoted to God Almighty, noble, intelligent and skilled. In addition, education also equips humans both physically and spiritually so that they are able to face all forms of challenges in their life journey (Hastati et al., 2024).

Based on findings from observations conducted at SDN Daya II in Makassar, it was found that a large number of students still had difficulty understanding the learning material and lacked motivation to learn. The researchers observed several factors related to teachers that caused low motivation and learning outcomes among students, namely 1) the dominant teaching method was lecturing, making it difficult for students to concentrate, 2) the use of learning media was ineffective, relying only on YouTube videos and books as the main sources, 3) teachers made little effort to motivate students, and 4) teachers had difficulty finding appropriate learning media, given the different learning styles of each student. Meanwhile, in terms of students, 1) students have difficulty understanding the material presented by teachers, 2) students are less active in the learning process, both in asking questions, discussing, and doing independent or group assignments, 3) students feel bored because the learning models and media used are not interesting, 4) students lack focus and are easily distracted, so they do not pay full attention when teachers explain the material.

Learning in schools has several factors that can influence the success or failure of learning activities, as seen from students' learning outcomes. One factor that can influence this is student motivation and the learning methods used in schools (Sogunro, 2014).

Motivation is very important because with high motivation, students will find it easier to achieve learning objectives with better learning outcomes. Motivation is the overall driving force within students that triggers learning activities, ensures the continuity of learning activities, and provides direction for learning activities, so that the goals desired by students are achieved (Nugraheni, 2019).Motivation is an effort made under certain conditions so that a person wants to do something (Alannasir & Selvi, 2018).

Two terms often used to describe learning motivation are learning process and enthusiasm. Motivation is understood as a psychological drive that influences how a person thinks and acts to achieve certain goals (Nurhidayati et al, 2022). In the context of learning, low motivation is reflected in students' lack of willingness to complete tasks even though they have adequate abilities. Conversely, students with good motivation show interest in learning activities, are more persistent in facing difficulties, and have the will to develop.

Motivation does not arise automatically, but is influenced by internal factors, such as personal interests and goals, as well as external factors such as teacher support and the learning environment. Learning that is comfortable and enjoyable tends to be more readily accepted by students. This condition is in line with the theory of Hedonism, which comes from the Greek word hedone, meaning pleasure or enjoyment. This theory explains that individuals are naturally driven to choose activities that give them pleasure and avoid things that they find boring or burdensome. In the world of education, the theory of Hedonism is reflected in the tendency of students to be more interested in interactive and enjoyable learning activities, and to tend to ignore monotonous and uninteresting learning (Muliyah et., 2020).

Based on this perspective, learning strategies that can provide enjoyable learning experiences have the potential to increase student motivation. Game-based media such as Wordwall and the Jigsaw cooperative learning model can be alternatives because both create a more dynamic and participatory learning atmosphere that is in line with students' natural tendency to seek enjoyable learning experiences. Thus, the selection of interesting methods and media is not only complementary but also an important part of stimulating student motivation in accordance with the principles of Hedonism theory.

Conventional learning methods that rely solely on lectures and textbooks are no longer relevant (Mulyadi et al., 2021). One of the models used in the Merdeka curriculum is the jigsaw cooperative

learning model. Through this learning model, students are encouraged to think critically. The jigsaw cooperative learning model is a flexible type of cooperative learning method (Maryani & Suparno, 2018).

Students' difficulties in understanding lessons do not always indicate that they are incapable, but are more often caused by a lack of motivation to learn. When motivation is lacking, students are only physically present in class without engaging their minds and feelings in the learning process. They listen to the teacher, but do not really process the information because from the outset they have no curiosity or reason to feel that the material is important to understand. This situation makes learning merely a routine, rather than a meaningful process. As a result, the material presented is not properly absorbed and is quickly forgotten because it is never processed in depth by the students. This situation directly impacts learning outcomes. Many students actually attend classes and complete assignments, but their grades do not reflect their true understanding. This happens because the information they receive does not enter their long-term memory due to suboptimal absorption. Without a complete understanding, students' answers in evaluations are only temporary and do not demonstrate a deep mastery of the concepts. Thus, low learning outcomes are not solely due to a lack of tests or exercises, but because from the beginning, students are not truly engaged in understanding the material. When motivation to learn is low, difficulties in absorbing learning arise, and this continues to result in low learning outcomes.

The jigsaw learning model is a variation of the Collaborative Learning model, which is a group learning process where each member contributes their information, experiences, ideas, attitudes, opinions, abilities, and skills to collectively improve the understanding of all members so that learning outcomes can be improved (Harefa et al., 2022).Jigsaw cooperative learning is a type of cooperative learning that encourages students to be active and help each other in mastering the subject matter to achieve maximum performance (Sulastri & Rochintaniawati, 2009).

The application of interactive learning models is designed so that students ask questions and find their own answers. The advantages of the interactive learning model are that it builds positive behavior among group members, smart students will tend to help their friends who are having difficulties, the learning process becomes more dynamic, and students are able to solve problems both in groups and independently (Fitriah & Putri, 2024). In addition, the use of technology can improve the quality of student learning in the digital age. Technology plays a very important role because it facilitates access to information, strengthens interaction and collaboration, adapts methods and materials to student needs, and provides objective evaluation of learning outcomes (Mutakim, 2023).

Media Wordwall is a web-based platform that provides various types of educational games designed to support the student learning evaluation process. Wordwall is a fun quiz-based educational tool that presents a number of questions in an interesting and varied format, which students answer together, resulting in meaningful learning (Nisa & Susanto, 2022).

Wordwall is an effective tool for creating learning evaluations in the form of educational games and can be used for both online and offline learning (Lestari & Baalwi, 2025). Previous research has shown that the application of the jigsaw model can improve student learning outcomes. However, the use of the jigsaw model has not been integrated with digital learning media that can increase student activity and motivation (Awalina et al., 2024).

Meanwhile, research by (Fadilah & Kuswandi, 2025)shows that the use of Wordwall interactive learning media affects student learning outcomes in IPAS subjects in elementary schools. However, the combination of the jigsaw model and Wordwall media in IPAS learning in elementary schools has not been widely studied.

As an effort to overcome this condition, the use of the Jigsaw cooperative learning model combined with Wordwall interactive media is considered relevant. The Jigsaw model encourages collaboration and learning responsibility among students, while Wordwall provides a more engaging learning experience through interactive activities. The combination of the two is believed to increase student engagement, curiosity, and understanding of the material. Therefore, it is important to further examine whether the application of the Jigsaw cooperative learning model assisted by Wordwall media affects

student motivation and learning outcomes.

2. METHODS

This study used a quantitative approach with a one-group pretest-posttest pre-experimental design. The study population consisted of all 26 fourth-grade students at SDN Daya II Makassar, who also served as the study sample through saturated sampling or total sampling, so that all members of the population became research subjects in order to obtain results that reflected the actual conditions in the classroom. Data collection was carried out using a learning motivation questionnaire, pretest and posttest learning achievement tests, observation sheets of student activities and teaching implementation by teachers, as well as documentation as supporting data. The learning motivation questionnaire was first tested for validity and reliability to ensure the instrument's suitability in measuring student motivation.

The initial stage of the research began with the distribution of a learning motivation questionnaire to determine the students' initial motivation levels, followed by a pretest to measure their initial understanding of the material on changes in the form of objects. During the learning process, the Jigsaw cooperative learning model was applied by dividing students into expert groups and home groups to exchange information and build a sense of responsibility in learning. To make learning activities more interesting, the interactive media Wordwall was used as a means of practice and evaluation in the form of educational games. After the treatment was completed, a posttest was conducted as a final evaluation to see the improvement in student learning outcomes after the learning model was applied.

The data obtained from the learning motivation questionnaire was analyzed using validity and reliability tests to examine the suitability of the instrument, while the student learning outcome data was analyzed using normality tests to determine the data distribution. Next, a paired sample t-test was conducted to compare the pretest and posttest results to see the effect of applying the Jigsaw cooperative learning model assisted by Wordwall media on student motivation and learning outcomes.

3. RESULTS AND DISCUSSION

Research Results

1. The Learning Process Using the Jigsaw Cooperative Learning Model Based on Wordwall Media for Students

In general, the results reveal a steady increase in student activeness and interest in learning during the application of the Jigsaw cooperative learning model integrated with Wordwall media. The data obtained reflect that this learning strategy does not only make students more involved, but also helps them understand the material more meaningfully and enjoy the learning process. Thus, the combination of Jigsaw and Wordwall can be considered a relevant and effective alternative to be implemented consistently in order to support better learning achievement.

The results of teacher activity observations using the jigsaw cooperative model assisted by Wordwall media are presented:

Table 3.1 Results of Teacher Activity Observations

	Meeting I	Meeting II	Meeting III	Meeting IV	Meeting V
Score obtained/ maximum score	*Pretest*	20 / 44	28 / 44	39 / 44	*Posttest*
Percentage (%)		45%	63%	88%	
Category		Poor	Fair	Verry Good	

Based on the observation results, the teacher's activity in applying the jigsaw cooperative learning

model assisted by Wordwall media showed an increase in each meeting. The observation was conducted to assess the teacher's ability to manage learning and to see the effect of applying the model and media on student engagement.

In the second meeting, the teacher scored 20/44 (45%) in the poor category, indicating that the teacher was still adjusting to the jigsaw syntax flow and the use of Wordwall. In the third meeting, the score increased to 28/44 (63%) in the fair category, with the teacher beginning to be more focused in dividing student roles and managing Wordwall activities interactively. In the fourth meeting, the score reached 39/44 (88%) with a very good category, indicating that teachers were able to manage learning systematically, create an active classroom atmosphere, and utilize Wordwall to strengthen material comprehension.

Overall, the application of the Wordwall-assisted jigsaw model had a positive impact on teachers' ability to manage learning and increase student activity, making it a viable alternative learning strategy for IPAS in elementary schools.

The results of student activity observations using the jigsaw cooperative model assisted by Wordwall are presented:

Table 3.2 Results of Student Activity Observations

	Meeting I	Meeting II	Meeting III	Meeting IV	Meeting V
Score obtained/ maximum score	*Pretest*	13 / 32	17 / 32	28 / 32	*Posttest*
Percentage (%) (%)		40%	53%	87%	
Category		Poor	Fair	Verry good	

Based on observations of student activity during the implementation of the jigsaw cooperative learning model assisted by Wordwall media, there was a significant increase in student engagement and understanding from one meeting to the next. This observation aimed to assess whether the jigsaw cooperative learning model encouraged active student participation and helped students understand the material more deeply.

In the second meeting, when the teacher began to apply the jigsaw learning model assisted by Wordwall media, students scored 13 out of a total score of 32, with a percentage of 40%, which is classified as poor. These results indicate that some students still have difficulty understanding the material and are not yet confident enough to actively ask questions or discuss in groups. In the third meeting, the score increased to 17 out of 32 with a percentage of 53%, which is classified as quite good. This result shows that students are beginning to get used to the group learning process through the jigsaw cooperative learning model and are more active in using Wordwall as an interactive tool. Students appear to be more confident in answering questions and demonstrate a better understanding of the learning material compared to the previous meeting.

In the fourth meeting, the score reached 28 out of 23 with a percentage of 87%, which is in the very good category. This shows that students have understood the material very well, are able to work independently in groups, and show high enthusiasm during learning activities. In addition, students actively expressed their opinions, completed group assignments, and were more responsive to questions asked through Wordwall.

Overall, the observation results showed a positive increase in student activity in the learning process after the implementation of the jigsaw cooperative learning model assisted by Wordwall. This shows

that this learning model not only improves student understanding but also encourages student involvement and activity during the learning process. Therefore, it is recommended that this jigsaw cooperative learning model continue to be implemented to achieve learning outcomes.

Results of Student Learning Motivation Questionnaire

The results of the student learning motivation questionnaire obtained after participating in learning activities are presented :

Table 3.3 Result of Student Learning Motivation Questionnaire

Motivation Category	**Score Range**	**Number of Student**	**Percentage**
Highly Motivated	49–60	12 student	46%
Motivated	38–48	10 student	38 %
Less Motivated	<38	4 student	15%
Not Motivated (–)	–	0 student	0%
Total	–	**26 student**	**100%**

Based on the results of the learning motivation questionnaire distributed to fourth-grade students, an overview of the students' motivation levels during the learning process was obtained. This questionnaire consisted of 15 statements with a rating scale of 1 to 4 that reflected several aspects of learning motivation, such as interest, attention, activity, and responsibility in learning.

Of the 26 students who were the subjects of this study, the data showed that 12 students, or about 46%, were in the highly motivated category. Most of the students, namely 10 students or 38%, were in the motivated category, while only 4 students or 15% were classified as less motivated. These findings indicate that, in general, the level of student learning motivation was high, reflecting a positive response to the application of the jigsaw cooperative learning model assisted by wordwall media.

Validity Test

Table 3.4 Validity Test Results

No.	**Item Pernyataan**	**R tabel**	**R hitung**	**Sig. (2-tailed)**	**Keterangan**
1	P01	0.388	0,649	< 0,001	Valid
2	P02	0.388	0,693	< 0,001	Valid
3	P03	0.388	0,717	< 0,001	Valid
4	P04	0.388	0,613	< 0,001	Valid
5	P05	0.388	0,655	< 0,001	Valid
6	P06	0.388	0,861	< 0,001	Valid
7	P07	0.388	0,689	< 0,001	Valid
8	P08	0.388	0,753	< 0,001	Valid
9	P09	0.388	0,829	< 0,001	Valid
10	P10	0.388	0,843	< 0,001	Valid
11	P11	0.388	0,791	< 0,001	Valid
12	P12	0.388	0,760	< 0,001	Valid
13	P13	0.388	0,844	< 0,001	Valid
14	P14	0.388	0,825	< 0,001	Valid
15	P15	0.388	0,567	0,003	Valid

Based on the validity test results (Table 3.4), correlation values ranged from 0.567 to 0.861 were obtained. All significance values (Sig. 2-tailed) were below 0.05, with most even below 0.001.When compared to the table r value at a significance level of 5% with 26 respondents, which is 0.388, all items

had an r count value greater than the table r.

This indicates that all items in the questionnaire are valid and can be used to measure the learning motivation of fourth-grade students in this study. This high validity shows that each statement is able to represent aspects of learning motivation well, so that the data generated from this questionnaire can be trusted and scientifically accountable.

Realibility Test

Reliability Statistics

Cronbach's Alpha	N of Items
,938	15

IBM SPSS Statistics Version 30

After conducting a reliability test on the student learning motivation questionnaire consisting of 15 statements, a Cronbach's Alpha value of 0.938 was obtained. This value indicates that the level of consistency between the statements in the questionnaire is very high.

In reliability analysis, an instrument is said to be very reliable if the Cronbach's Alpha value exceeds 0.90. Therefore, the figure of 0.938 indicates that all items in the questionnaire have a very good level of reliability and consistency in measuring student learning motivation. With these results, it can be concluded that the questionnaire used in this study meets the requirements as a reliable instrument. This means that this questionnaire can be relied upon to collect data accurately and is suitable for use in further research.

2. The Effect of the Jigsaw Cooperative Learning Model Assisted by Wordwall Media on the Motivation and Learning Outcomes of Fourth Grade Students at SDN Daya II Makassar

Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Nilai Pretest Siswa Kelas IV	26	20,00	85,00	52,5000	17,39253
Nilai Posttest Siswa Kelas IV	26	45,00	90,00	71,9231	9,38903
Valid N (listwise)	26				

IBM SPSS Statistics Version 30

Table 3.5 Categorization of Material Mastery in the Pretest

No	Interval (Scale 100)	Frequency	Percentage (%)	Learning Outcome Category
1	0 – 34	4	15,4%	Very Low
2	35 – 54	10	38,5%	Low
3	55 – 64	7	26,9%	Moderate
4	65 – 84	5	19,2%	High
5	85 – 100	0	0%	Very High
	Jumlah	**26**	**100%**	-

Based on the frequency distribution of pretest scores (Table 3.5), most of the 26 students were in the low category, with 10 students (38.5%). This shows that the students' motivation and initial mastery

of the material were not yet optimal.

In addition, there were 7 students (26.9%) who fell into the medium category, which means that their understanding was sufficient but still needed to be improved in order to reach a higher category. A total of 5 students (19.2%) were already in the high category, indicating that a small number of students had a good understanding from the start. However, there are still 4 students (15.4%) in the very low category, indicating that some students really struggle to understand the basic material. No students were able to reach the very high category in the pretest stage. Overall, these results show that the majority of students are still in the low and moderate categories, so more effective learning strategies are needed to help improve students' motivation and understanding of IPAS material.

Pre-test of Learning Outcomes of Fourth Grade Students at SDN Daya II Makassar, Before Implementing the Jigsaw Cooperative Learning Model Assisted by Wordwall Media

Statistics

N	Valid	26
	Missing	0
Mean		10,5000
Median		10,0000
Mode		8,00
Std. Deviation		3,47851
Range		13,00
Minimum		4,00
Maximum		17,00
Sum		273,00

IBM SPSS Statistics Version 30

Based on the pretest data obtained from 26 students, the average score achieved was 10.50. This figure indicates that, in general, the students' initial ability to understand the material was moderate. The median score of 10.00 shows that half of the students scored below or equal to 10, while the other half scored above or equal to that score.

Then, the mode value is 10, indicating that this value appears most frequently among all students. This shows a tendency for most students to obtain similar scores, so that the values tend to be centered. The recorded standard deviation value of 3.48 shows that there is a fairly varied distribution of values. This indicates that some students obtained scores that were far from the average, but still within acceptable limits.

The lowest score obtained by students was 4, and the highest score was 17, resulting in a score range of 13 points. The total overall pretest score of students reached 273, which is the accumulation of all individual scores.Overall, these pretest results show that the students' initial abilities varied considerably. Students scored around 10, but there were still some students who scored lower or higher. These results provide an important initial overview for evaluating the impact of the treatment to be provided through the learning model.

In clarifying the presentation of data, the posttest results are visualized in Figure 3.1:

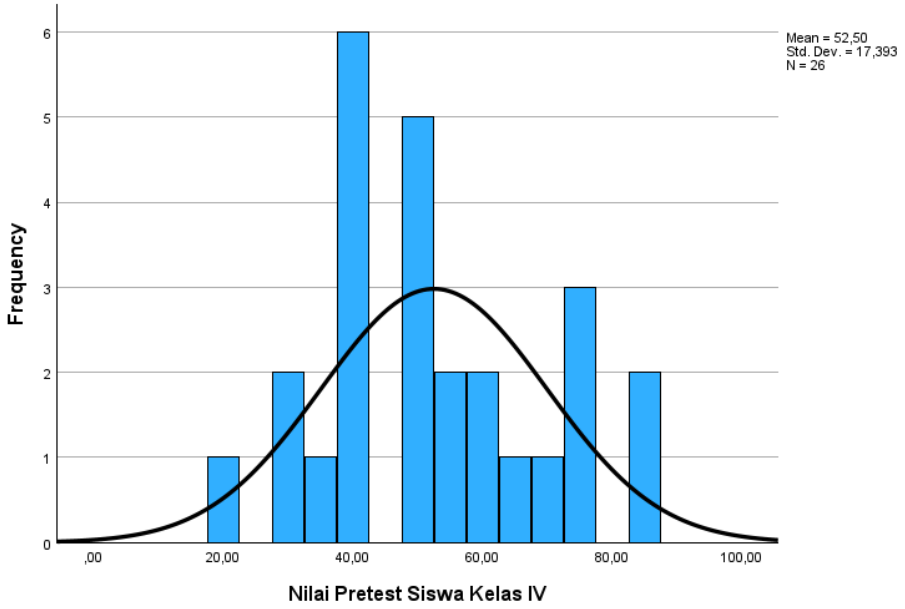

Figure 3.1 Pretest Bar Chart

The bar chart above illustrates the results of the students' pretest, which were grouped into five categories of comprehension levels: very low, low, moderate, high, and very high. Based on the distribution of data in the chart, it can be seen that the students' initial comprehension of IPAS material is still generally low.

This is indicated by the fact that 18 students (69.23%) were in the low category (score range 35–54), and 4 students (15.38%) were in the moderate category (range 55–64). Thus, there were 22 students, or about 84.61%, who had not yet reached an optimal level of understanding.

In addition, there were 4 students (15.38%) who fell into the very low category (range 0–34), indicating that their understanding of the material was still very limited. Meanwhile, only 3 students (11.53%) managed to reach the high category (range 65–84), and no students reached the very high category.

This condition shows that the conventional learning methods used previously have not been able to accommodate students' learning needs comprehensively. Therefore, it is necessary to apply more interactive and collaborative learning strategies, such as the Jigsaw cooperative learning model assisted by Wordwall media, to help students understand the material more deeply and enjoyably.

Table 3.6 Categorization of Material Mastery in the Posttest

No	Interval (Scale 100)	Frequency	Percentage (%)	Learning Outcome Category
1	0 – 34	0	0%	Very Low
2	35 – 54	2	7,7%	Low
3	55 – 64	4	15,4%	Moderate
4	65 – 84	15	57,7%	High
5	85 – 100	5	19,2%	Very High
	Jumlah	**26**	**100%**	-

The distribution of post-test scores is presented in Table 3.6. The majority of the 26 students were

in the high category, with 15 students (57.7%). This shows that most students understood the material well after the implementation of the jigsaw cooperative learning model assisted by Wordwall.

In addition, there were 5 students (19.2%) who achieved the very high category, indicating that there were students who had excellent mastery of the material. Meanwhile, 4 students (15.4%) were still in the medium category, and 2 students (7.7%) were in the low category. In the posttest results, there were no longer any students in the very low category.

In general, these results prove that the application of the jigsaw cooperative learning model assisted by Wordwall media has a positive impact on improving student learning outcomes. A comparison between the pretest and posttest shows a shift in the number of students from the low category to the high and very high categories, which means that the learning process is effective in improving student understanding.

The posttest data on the results of the science learning of Class IV students at SDN Daya II Makassar can be seen as follows:

Statistics

Skor Posttest Siswa

N	Valid	26
	Missing	0
Mean		14,3846
Median		15,0000
Mode		15,00
Std. Deviation		1,87781
Range		9,00
Minimum		9,00
Maximum		18,00
Sum		374,00

IBM SPSS Statistics Version 30

After implementing cooperative learning using the jigsaw model assisted by Wordwall, students' post-test scores showed a significant increase compared to their pre-test scores. The mean post-test score was 14.38, which means that most students scored within that range after the learning process. The median score of 15.00 indicates that half of the students scored 15 or above, while the other half scored below that.

The mode score of 14.00 shows that this was the score most frequently obtained by students in the posttest. This indicates consistency in student scores after participating in the learning process. In terms of data distribution, the standard deviation of 2.89 shows that the students' scores did not vary greatly from the average. The minimum score is 8 and the maximum is 19, with a range of 11, reflecting differences in achievement between individuals, although within reasonable limits.

Based on these results, it can be concluded that the learning model applied was able to improve students' overall learning outcomes, with the distribution of scores tending to be concentrated above the pretest average.

In clarifying the presentation of data, the posttest results are visualized in Figure 3.2 :

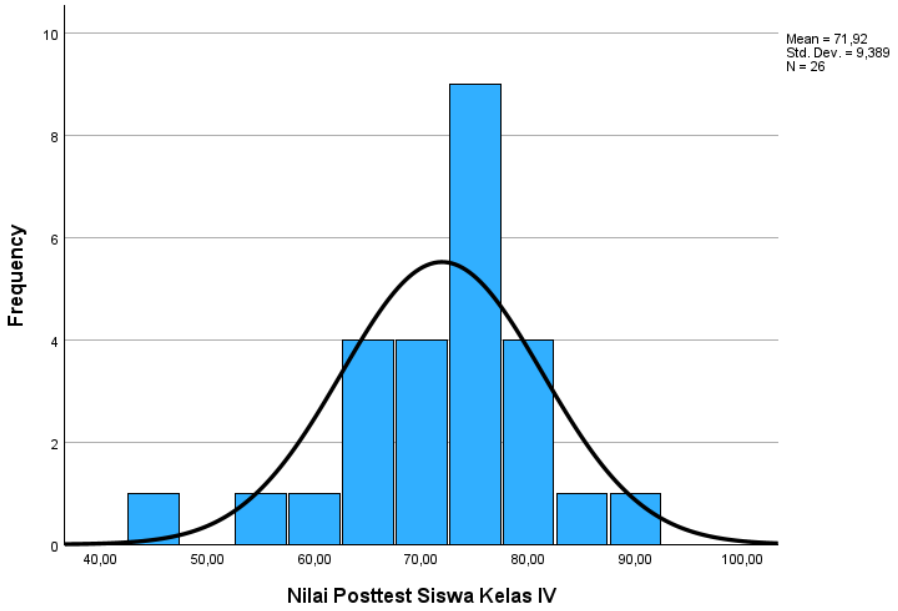

Figure 3.2 Posttest Bar Chart

The bar chart above shows the distribution of students' post-test results after participating in learning using the jigsaw cooperative model assisted by Wordwall media. Based on the chart, it can be seen that students' understanding has improved compared to the pre-test.

Most students were in the moderate (55–64 points) and high (65–84 points) categories, with a significant increase in numbers. This shows that many students successfully achieved a better level of understanding after learning. Meanwhile, the number of students in the low and very low categories decreased quite drastically.

This shift indicates that the learning model applied was effective in helping students understand the material better. Collaboration in small groups and the use of Wordwall interactive media made the learning process more interesting and encouraged active student participation. This also contributed to an overall improvement in learning outcomes.

This, the posttest diagram clearly shows that the application of the Jigsaw cooperative learning model assisted by Wordwall media has a positive contribution to improving students' understanding of IPAS subjects.

Normality Test

a. Pretest

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Skor *Pretest* Siswa	,148	26	,145	,956	26	,323
Source: *IBM SPSS Statistics Version 30*						

Based on the results of normality tests conducted using two methods, namely Kolmogorov–Smirnov and Shapiro–Wilk, significant values (Sig.) of 0.145 for Kolmogorov–Smirnov and 0.323 for Shapiro–Wilk were obtained. Since both significance values are greater than 0.05, it can be concluded

that the students' pretest learning data are normally distributed.

b. Posttest

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Skor *Posttest* Siswa	,205	26	,006	,927	26	,067
Source: *IBM SPSS Statistics Version 30*						

Based on the results of normality tests conducted using two methods, namely Kolmogorov–Smirnov and Shapiro–Wilk, a significance value (Sig.) of 0.006 was obtained for Kolmogorov–Smirnov and 0.067 for Shapiro–Wilk. Although the Kolmogorov–Smirnov significance value was below 0.05, because the Shapiro–Wilk significance value was greater than 0.05, it can be concluded that the students' posttest learning data were normally distributed.

c. Uji Paired Sample Test

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Nilai *Pretest* Siswa Kelas IV	52,5000	26	17,39253	3,41096
	Nilai *Posttest* Siswa Kelas IV	71,9231	26	9,38903	1,84134

Source: *IBM SPSS Statistics Version 30*

Based on the results of the paired sample statistics test, it is known that the average pretest score of students is 52.50 with a standard deviation of 17.39. After the learning process, the average posttest score increased to 71.92 with a standard deviation of 9.38. This increase in the average score indicates that there was an improvement in student learning outcomes after they participated in learning using the jigsaw cooperative model assisted by Wordwall media. The significant difference between the pretest and posttest scores illustrates that the learning model used had a positive effect on students' understanding of IPAS subjects.

Discussion

This study examines the effect of the Wordwall-assisted jigsaw cooperative learning model on the motivation and learning outcomes of fourth-grade students at SDN Daya II Makassar. This study was conducted from May 16, 2025, to June 28, 2025. This study used a One Group Pretest-Posttest Design, which involved only one group as the research sample. This group was given a pretest at the beginning and a posttest at the end of the study period. This research design was chosen because this study provided treatment in the form of applying the jigsaw cooperative learning model assisted by Wordwall media on the motivation and learning outcomes of fourth-grade students at SDN Daya II Makassar in science.

The application of the Jigsaw cooperative learning model assisted by Wordwall media in science learning for fourth-grade students at SDN Daya II Makassar showed positive results based on a series of statistical tests that had been conducted.

First, the validity test results for the learning motivation questionnaire showed that all of the statements used were valid, as each had a significance value (Sig. 2-tailed) of less than 0.05. This indicates that the instrument used was able to accurately measure aspects of student learning motivation.

Furthermore, the reliability test produced a Cronbach's Alpha value of 0.938, which means that the questionnaire instrument has very high consistency and is suitable for use as a data collection tool.

Then, a normality test was conducted on the pretest and posttest data to determine whether the data was normally distributed. The Shapiro-Wilk test results showed a pretest significance value of 0.323 and a posttest significance value of 0.067, both of which were greater than 0.05. Thus, the pretest and posttest data met the normality assumption and could be analyzed using parametric statistical methods.

To determine the effect of the learning model on student learning outcomes, a paired sample t-test was conducted. The analysis results showed that there was a significant difference between the pretest and posttest scores, with a significance value (Sig. 2-tailed) of < 0.001. The average pretest score of the students was 52.50, while the average posttest score was 71,92, which shows an increase in learning outcomes after the implementation of the learning model. Overall, these findings indicate that the use of the jigsaw model combined with Wordwall interactive media can increase student motivation and learning outcomes. Active student involvement in group discussions and the use of engaging media make learning more meaningful and enjoyable. Therefore, this learning model can be an effective alternative to improve the quality of IPAS learning in elementary schools.

Picture 3.1 Distribution of motivation cooperative learning

Picture 3.2 Application of the jigsaw model assisted by Wordwall media questionnaires and pretest sheets.

Picture 3.3 Quiz administration.

Picture 3.4 Distribution of posttest sheets.

4. CONCLUSIONS AND SUGGESTIONS

The application of the Jigsaw cooperative learning model assisted by Wordwall media has been proven to increase the motivation and learning outcomes of fourth-grade students in IPAS subjects. This can be seen from the increase in the number of students in the high motivation category and the decrease

in the number of inactive students. The learning atmosphere that combines group work and interactive media makes students more focused, interested, and encouraged to participate actively.

This increase in motivation also had an impact on learning outcomes. Based on the pretest and posttest results, there was an increase in the number of students in the high category from 19.2% to 57.7%, as well as an increase in the very high category from 0% to 19.2%. Conversely, the number of students in the low category decreased from 38.5% to 7.7%, and the very low category decreased from 15.4% to 0%. These data show a significant improvement in student learning outcomes after the implementation of the Jigsaw learning model assisted by Wordwall media. Collaboration within expert groups and home groups encourages information exchange, while the use of Wordwall provides a varied learning experience through educational games that stimulate memory and understanding.

Based on these findings, teachers can consider using the Jigsaw model combined with Wordwall media as an alternative learning strategy that is more interesting and relevant to the characteristics of today's elementary school students. Schools are expected to support the implementation of digital media-based learning by providing adequate facilities such as devices and internet networks. For further research, it is recommended that the application of this model be tested on a larger sample size or in different subjects so that the results can be compared and analyzed more comprehensively.

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