



E-ISSN 2338-6770

Submitted date : -

Revised date : -

Accepted date : -

Correspondence Address:

Dance, drama and music arts education
Faculty language and arts, University of
Surabaya, E-
mail: yolanda.20074@mhs.ac.id

Implementation of Jigsaw Learning Method in Improving Students' Skills in Band Extracurricular Activities at SMPN 34 Surabaya

Yolanda Oktavia Nurrahmah1,
State University of Surabaya, Surabaya, Indonesia

E-mail: yolanda.20074@mhs.unesa.ac.id

Abstract: Band extracurricular is a learning activity carried out outside school hours or intracurricular activities to hone students' interests and talents in the field of music. The extracurricular aims to train students who have a desire to be artistic in the world of music. So it is necessary to choose the right learning model, learning method and learning material to support extracurricular activities at SMPN 34 Surabaya. To determine the improvement in skills and the effectiveness of implementing the Jigsaw learning model in improving students' skills in band extracurricular activities at SMPN 34 Surabaya, this study uses a mixed descriptive method of qualitative and quantitative with an approach Classroom Action Research (CAR) or Classroom Action Research.

Classroom Action Research (CAR) focuses on efforts to change current conditions to better conditions. This model is in the form of a continuous cycle, consisting of stages of planning, action, observation, and reflection.

The results of this study indicate that the application of the Jigsaw learning model can be the right solution to improve students' skills in band extracurricular activities. The implementation of the Jigsaw learning model in the Band extracurricular at SMPN 34 Surabaya has been proven to improve students' skills. The observation results showed an increase in the average value of students' skills from 54.12 in the pre-cycle, to 71.96 in the first cycle, and 76.94 in the second cycle. This shows that the Jigsaw model is able to provide a positive impact in improving students' music playing skills gradually through effective collaboration.

Keywords: Learning, Extracurricular, Band, Jigsaw Model

1. INTRODUCTION

Extracurricular activities are activities carried out outside of school hours with the aim of developing students' abilities and interests. Based on the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 62 of 2014 Article 1 Paragraph 1, these activities are carried out by students outside of intracurricular and co-curricular learning hours, and remain under the supervision or guidance of the school. There are two types of extracurricular activities, namely mandatory and optional.

One of the extracurricular activities that is engaged in the arts and has quite a lot of enthusiasts is Band. This is proven by the existence of competitions, festivals and even performances that are held in Indonesia and even abroad. In addition to producing professional and accomplished musicians, many students also excel in the world of Band music art.

The material taught by Mr. Rumpoko in the Band extracurricular is the song by Sam Smith "Stay With Me" and the song by Sheila On 7 "Anugerah Terindah" because according to him, both songs have simple and few chords so they are easy for students to learn, especially students who are new to and learning musical instruments.



From the observation results, a number of problems were identified that caused low student skills in extracurricular band activities at SMPN 34 Surabaya, especially for students in grades VII to IX. One of the main causes is the lack of diverse learning methods, which makes students less active in participating in the learning process, especially when playing musical instruments such as drums, guitar, bass, keyboard, and vocals. The lack of active student participation has a direct impact on their low abilities.

The application of monotonous learning methods and used repeatedly over a long period of time can cause boredom among students. This condition affects the decline in learning effectiveness and failure to achieve the expected goals.

The extracurricular band activity at SMPN 34 Surabaya has been held for approximately 10 years. The extracurricular band trainer at SMPN 34 Surabaya is Mr. Rumpoko (38).

The solution to overcome the problem of student skills in extracurricular band activities including drums, guitar, bass, keyboard, and vocals at SMPN 34 Surabaya is to apply a cooperative learning model. The cooperative learning model was chosen because it encourages students to not only actively communicate, but also to be actively involved in the learning process, so that the skills learned can develop in line with the learning objectives that have been set. (Rostika & Junita, 2017).

Jigsaw cooperative learning is one of the effective methods to improve student learning outcomes through collaboration between group members who exchange information and help each other. In previous studies, the Jigsaw method has been shown to improve student learning outcomes, especially in science subjects. For example, research by Astiti & Widiyana (2017) showed a significant increase in student learning activities, from 13.04% in the first cycle with fairly active criteria to 63.82% with active criteria. The increase in student learning outcomes reached 50.78%.

However, most of these studies focus on the application of the Jigsaw method in regular classroom learning and science subjects. The research gap that emerged was the lack of studies on the application of this method in extracurricular contexts, especially those related to the development of non-academic skills such as musical skills.

2. METHOD

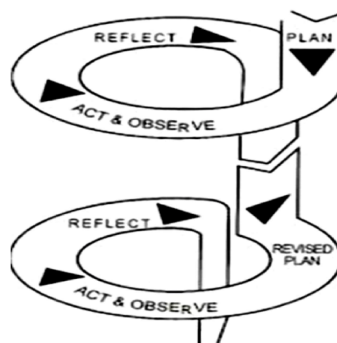
This study applies a mixed methods research approach, a strategy that integrates elements of quantitative and qualitative research in one study. This approach aims to gain a more comprehensive understanding of a phenomenon by utilizing the advantages of each type of method. This approach was chosen to obtain a comprehensive picture of the application of the Jigsaw learning model in improving students' skills in band extracurricular activities at SMPN 34 Surabaya.

This study uses a mixed method with the PTK (Classroom Action Assessment) model. This type of research model is very suitable as a qualitative and quantitative study to measure how far the development of extracurricular Band learning at SMPN 34 Surabaya.

This study uses the Classroom Action Research (CAR) model developed by Kemmis and McTaggart (1990:14), as explained by

Kusumah and Dwitagama (2020:20–21). This model is in the form of a continuous cycle that includes four main stages, namely planning, action, observation, and reflection.

Figure .1PTK Cycle According to Kemmis & McTaggar



The Kemmis and MC Taggart models consist of four steps, namely:

- a. Planning Stage
In the planning stage, researchers compile and prepare various teaching materials that will be used in implementing classroom action research. The teaching materials prepared include learning modules, learning models, and observation sheets.
- b. Action Stage
After carrying out the planning stage, the next stage is action, the researcher carries out what was previously planned with the teacher.
- c. Observation Stage (Observation)
After the action implementation stage, the next step is the observation stage. At this stage, data is collected regarding the learning process carried out by the teacher. Researchers noted various advantages and disadvantages in implementing this action.
- d. Reflection Stage
This stage is the process of discussing and analyzing research results after the action has been implemented, which aims to determine improvement steps in the next stage.

Data source

The data sources in this study are data obtained by researchers to then be processed in the form of scientific work. According to Sugiyono (2019:194) data sources are divided into two parts, namely:

1. "Primary data is data obtained directly by researchers through the interview process or filling out questionnaires, meaning that the data source provides information directly to researchers."From this statement, primary data sources are data sources obtained directly from sources.
2. "Secondary data is data that researchers do not directly receive from data sources". From this statement, it can be interpreted that secondary data sources are data sources that are not obtained from a person or source, but are obtained from documents collected by researchers such as documentation, book notes, and activity reports.

Data collection technique

divided into three. Sugiyono (2019: 194) said that "In qualitative research, three data collection techniques are used, namely interviews, observation and documentation". The three data collection techniques are described as follows:

1. Observation

Observation is an observation activity carried out in a structured manner on various symptoms, both physical and

psychological. In its implementation, observation is divided into two types, namely participatory observation and non-participatory observation. In this case, the researcher used non-participant observation, because the researcher only observed the extracurricular band activities at SMPN 34 Surabaya.

2. Interview

Interview is one of the data collection methods conducted by asking questions directly to the informant. According to Haris Herdiansyah (2013:31). In this study, interviews are divided into two types, namely structured and unstructured interviews. Structured interviews are conducted by researchers preparing a list of questions in advance before conducting interviews with informants. Meanwhile, unstructured is by asking questions spontaneously.

3. Documentation

Documentation is a data collection technique by taking notes, taking photos and recording audio or video of learning activities at SMPN 34 Surabaya. Taking notes can be done through a notebook to collect the data that has been obtained. While taking photos and recording audio or video using a cellphone. In this study, researchers used a cellphone as a video and sound recording tool.

Data Triangulation

In this study, the researcher applied triangulation as a method to ensure the validity of the data. According to Sugiyono (2012:327), triangulation technique is a way of collecting data using various different sources. Triangulation can be done in three ways, namely:

1. Source Triangulation

Source triangulation was conducted by reviewing data that had been obtained from other sources. In searching for data sources, the researcher dug up information about the Band extracurricular at SMPN 34 Surabaya Rumpoko (38) as the Band extracurricular trainer and students who participated in the Band extracurricular.

2. Triangulation Technique

Technical triangulation is carried out by reviewing data from the same source using different techniques, namely observation, interviews and documentation.

3. Time Triangulation

Time triangulation in this study was conducted by observing the learning process in extracurricular activities at SMPN 34 Surabaya at different times. This was done to test the credibility of the data including models, methods and learning materials. So that the data obtained is valid and can be continued in the data analysis technique process.

Data Analysis Techniques

This data analysis is used to answer a problem being studied. The test results are analyzed quantitatively. Descriptive quantitative analysis is used to describe the learning achievements of students seen from the results of the evaluation scores. The student's score is said to be complete if it reaches a score of 75 according to the KKM score in the band extracurricular which is 75, so it can be assumed that using the Jigsaw learning model can improve band skills at SMPN 34 Surabaya.

1) Observation Data Analysis

Analysis of observation data using descriptive statistics, the formula for determining students' grades is as follows:

$$\text{Nilai} = \frac{\text{Jumlah Perolehan Skor Peserta Didik}}{\text{Jumlah Skor Maksimal}} \times 100$$

Data from observations of the learning activity process using teacher activity observation sheets in implementing learning using the Jigsaw model were analyzed qualitatively.

2) Test Data Analysis

The analysis of the test result data uses quantitative descriptive data analysis. To find out the average class value and KKM achievement, it is formulated as follows:

$$X = \frac{\sum X}{N}$$

Information:

X : average value

$\sum X$: total number of student scores

N : number of students

(Source: Sudjana et al., 2021)

After the class average score is obtained, qualitative data analysis also includes calculating the number of students who successfully achieve the KKM score.

3) To determine the percentage of students who have achieved the KKM, the relative frequency formula (percentage number) according to Arikunto (Mokalu et al., 2022) can be used, namely as follows:

$$P = \frac{F}{N} \times 100\%$$

Information:

P : percentage number

F: number of students who achieved KKM

N : number of students

4) Furthermore, to show the level of student success, the values obtained are categorized into a single grade. The following is a table showing the qualification of the band skill test results from 17 students. According to Suharsimi Arikunto (2017:245), these criteria are used as a reference in assessing the improvement of student test results.

Table 1. Band Skills Value Criteria

Number	Information
80 – 100	Very good
66 – 79	Good
56 – 65	Enough
40 – 55	Not enough
30 – 39	Fail

3. RESULTS AND DISCUSSION

3.1 Results

1. Description of Initial Conditions (Pre Cycle)

This study was conducted on students in grades VII to IX who participated in the band extracurricular at SMPN 34 Surabaya, with a total of 17 participants. Initial research activities included

observations to observe students' skills in playing musical instruments, such as drums, guitar, bass, keyboard, and vocals during extracurricular activities. In this research process, interviews were also conducted with Mr. Rumpoko, the band extracurricular mentor teacher. Based on the interviews, it was found that students' involvement in extracurricular activities was still less active, and their enthusiasm varied. Mr. Rumpoko explained that he had tried other learning methods, such as question and answer, as a variation of the lecture and drill methods, but the results were still less than optimal. Based on observation data obtained in the early stages, most students tended to be passive during the band extracurricular activities. Students did not take many notes on the material given, and their involvement in practice was less than optimal.

2 Cycle 1 Description

1. Action Planning

The planning stage in Cycle I includes a number of administrative preparations related to teaching modules and the preparation of instruments, including:

- a. Compiling a syllabus for extracurricular band activities with core material related to musical instrument playing skills.
- b. Preparation of Teaching Modules for each cycle, with each cycle consisting of 2 meetings.
- c. Preparation of observation sheets to measure students' skills in extracurricular activities.

2. Implementation of Action

In the first meeting, the teacher started with apperception to stimulate students' interest and focus in the musical skills material to be learned. The teacher then introduced the jigsaw learning model and provided directions regarding its implementation, ensuring that students understood the steps. After that, students were divided into four groups, each tasked with playing a different musical instrument, namely drums, guitar, bass, keyboard, and accompanied by vocals.

In the second meeting, the teacher again conducted apperception to remind the material that had been taught in the first meeting. Students then continued with the presentation of the results of the discussion and exercises that they had prepared, where each group played their musical instruments to form a unity in a complete band game.

3. Observation

Observations were conducted at each meeting session, namely the first and second meetings. In addition to observations, students were also asked to fill out a questionnaire to determine their responses to the use of the jigsaw learning model. The questionnaire was filled out at the end of Cycle I, precisely after the second meeting. To strengthen the findings of the questionnaire, the researcher also conducted free or unstructured interviews with the band extracurricular instructor and several students who were randomly selected and considered representative. This interview was conducted at the end of Cycle I, after the learning process at the second meeting was completed.

Overall, the average score obtained by students in this skill is 66.08%, which indicates that students' skills at this stage are in the good category and need to be improved. There is variation between students in the observation results, with the highest score reaching 90.00% and the lowest score 53.33%.

4. Analysis and Reflection

Based on the calculations, the students' skills in Cycle I showed an increase compared to the pre-cycle stage. The average percentage of achievement of each skill indicator in the observation of Band extracurricular activities in the pre-cycle was 54.12%, while in Cycle I it increased to 71.96%. This increase indicates that the implementation of a more effective learning model in Cycle I was able to improve students' skills in Band extracurricular activities.

3 Cycle 2 Description

1. Action Planning

Planning Cycle II for extracurricular band activities at SMPN 34 Surabaya was carried out by providing several corrective actions to overcome the shortcomings that occurred in Cycle I. The purpose of this improvement is to improve extracurricular band skills in students, so that learning outcomes can be maximized.

In the planning stage of Cycle II, similar to Cycle I, several administrative preparations and research instruments need to be carried out, including:

- a. Extracurricular Band Skills lesson syllabus with main material related to playing musical instruments (such as drums, guitar, bass, keyboard) and vocals.
- b. The teaching module consists of two meetings in each cycle.
- c. Observation sheet to assess students' skills during practice activities.

In addition to preparing administrative equipment and research instruments, researchers and teachers made improvements to the learning plan to improve the teaching and learning process in Cycle II. One of the shortcomings found in Cycle I was the lack of opportunities for students to review the material that had been learned at the end of the lesson. Therefore, the researcher suggested to teachers that in Cycle II, at the end of the lesson, a joint review session be held with students to ensure their deeper understanding and reduce the possibility of them forgetting the material that had been learned.

2. Implementation of Action

The jigsaw type cooperative learning model is still used, but several improvements have been made to improve the quality of the learning process.

Similar to Cycle I, the research in Cycle II involved observation of students' extracurricular band skills during the learning process using the jigsaw cooperative model. In addition, a questionnaire was filled out by students to obtain their responses to the implementation of the model, which was carried out at meeting 2 at the end of Cycle I.

Technically, the steps for implementing learning with the jigsaw cooperative model at the first and second meetings in Cycle II are similar to Cycle I, but several improvements have been made to optimize the success of the learning process. Some of the improvements implemented in Cycle II include:

- a. Delivering apperception and holding a short discussion or question and answer session to help students understand how the jigsaw cooperative learning model works.
- b. Teachers and researchers provide encouragement to students to participate more actively during learning, with the hope of improving students' extracurricular skills in the classroom.

c. Students who tend to waste time in discussions and collecting discussion results need to be given firmness by the teacher to ensure the smooth running of the learning process.

d. Teachers try to build students' self-confidence so that they are not afraid or embarrassed when expressing their opinions during presentations in front of the class.

3. Observation

In cycle II, observations were conducted by monitoring students' skills during extracurricular band activities that implemented the jigsaw cooperative learning model. This observation was conducted at each meeting, namely at the first and second meetings. In addition, students were also asked to fill out a questionnaire to assess their responses to the implementation of the jigsaw learning model, which was conducted at the end of Cycle II after the second meeting.

The observation results obtained are as follows:

Table 2. Percentage of Activity Achievement in the Observation of Students' Extracurricular Band Skills, Cycle 2, Meeting 1

No	Name	Remembering Music Melodies		Playing Musical Instruments				Total Score	Mark
		1	2	3	4	5	6		
1	AK	3	4	4	3	3	4	21	70.00
2	ANL	3	5	2	3	5	4	22	73.33
3	JM	3	4	4	4	4	4	23	76.67
4	A.F.	2	3	3	4	2	4	18	60.00
5	TA	4	2	4	4	4	4	22	73.33
6	LL	4	3	4	3	2	3	19	63.33
7	ZB	1	2	4	4	4	4	19	63.33
8	KPC.	4	4	4	4	1	4	21	70.00
9	AN	2	3	4	3	3	4	19	63.33
10	SF	3	3	2	3	2	2	15	50.00
11	CNP.	3	3	4	3	5	4	22	73.33
12	CPN	2	2	4	4	3	4	19	63.33
13	OF	3	4	4	3	3	3	20	66.67
14	JY	3	3	5	4	5	4	24	80.00
15	GL	3	2	4	3	5	2	19	63.33
16	SR	1	4	4	4	3	2	18	60.00

Based on the data in Table 2, which shows the percentage of achievement of activities in the observation of students' extracurricular band skills in Cycle 2, Meeting 1, it can be concluded that the average score obtained by students was 67.84, which is in the Good category.

[illegible]

The implementation of the Jigsaw Learning Model in improving students' skills in the band extracurricular at SMPN 34 Surabaya showed significant results, both in terms of student activity and the achievement of higher skills in playing musical instruments and remembering musical melodies. This cooperative learning model emphasizes the importance of collaboration between students in small groups, where each student is responsible for a certain part of the material, which they then teach to other group members.

In Cycle 2, Meeting 1, observation showed that the average student score was 67.84, which is categorized as good. Although this result already reflects a fairly good improvement compared to the previous cycle, there is room to improve several aspects that need to be strengthened.

Table 3. Percentage of Activity Achievement in the Observation of Students' Extracurricular Band Skills in Cycle 2, Meeting 1 and Meeting 2

No.	Student Name	Meeting 1	Meeting 2	Average
1	AK	70.00	73.33	71.67
2	ANL	73.33	66.67	70.00
3	JM	76.67	83.33	80.00
4	A.F.	60.00	76.67	68.33
5	TA	73.33	70.00	71.67
6	LL	63.33	100.00	81.67
7	ZB	63.33	96.67	80.00
8	KPC.	70.00	90.00	81.00
9	AN	63.33	90.00	76.67
10	SF	50.00	66.67	58.33
11	CNP.	73.33	96.67	85.00
12	CPN	63.33	83.33	73.33
13	OF	66.67	63.33	65.00
14	JY	80.00	70.00	75.00
15	GL	63.33	93.33	78.33
16	SR	60.00	90.00	75.00
17	AK	83.33	93.33	88.33
Average				76.94

Based on Table 3., the average results of students' extracurricular band skills achievement at the first and second meetings show that overall, the average student score is 76.94, which is included in the Good category. This shows that the majority of students have succeeded in achieving a fairly good level of skill, although there are variations between one student and another.

4. Inter Cycle Description

The results of the description of the pre-cycle, Cycle I, and Cycle II showed a significant increase in student skills, although there were several aspects of skills that experienced a slight decline. However, these results still met the learning success targets that had been set. This can be seen from the results of observations carried out during the learning process, which aims to determine students' skills in band extracurricular activities, including playing drums, guitar, bass, keyboard, and vocals at SMPN 34 Surabaya. A description of the

increase in students' skills in this band extracurricular activity can be seen in Table 4.

Table 4. Improvement of Students' Extracurricular Band Skills Between Cycles Based on Observation Sheets

No.	Student Name	Pre Cycle	Cycle 1	Cycle 2
1	AK	63.33	66.67	71.67
2	ANL	70.00	68.34	70.00
3	JM	70.00	66.67	80.00
4	A.F.	80.00	80.00	68.33
5	TA	0.00	76.67	71.67
6	LL	70.00	76.67	81.67
7	ZB	86.67	78.34	80.00
8	KPC.	0.00	88.34	81.00
9	AN	60.00	70.00	76.67
10	SF	0.00	71.67	58.83
11	CNP.	70.00	68.34	85.00
12	CPN	60.00	50.00	73.33
13	OF	63.33	73.34	65.00
14	JY	80.00	71.67	75.00
15	GL	63.33	65.00	78.33
16	SR	0.00	71.67	75.00
17	AK	83.33	80.00	88.33
Average		54.12	71.96	76.94

Table 4. shows a significant increase in students' skills in the Band extracurricular at SMPN 34 Surabaya after the implementation of the Jigsaw learning model. Before the implementation (pre-cycle), the average student skills were at 54.12, indicating a level of skills that still needed to be improved. After the implementation of cycle I, the average student skills increased to 71.96, indicating quite significant progress. Then, in cycle II, the average skills increased again to 76.94.

The effectiveness of implementing the Jigsaw learning model in improving students' skills in the Band extracurricular at SMPN 34 Surabaya can be seen from the improvement of students' skills in playing music, interaction between group members, and better understanding of the material. The Jigsaw model which is based on group cooperation allows students to share knowledge and skills in an interactive learning atmosphere.

3.2 Discussion

1. Improving Students' Skills in Band Extracurricular Activities at SMPN 34 Surabaya

In the pre-cycle stage in extracurricular band activities at SMPN 34 Surabaya, students' skills in playing musical instruments were still in the low category with an average score of 54.12.

These results indicate that most students still have difficulty in remembering melodies, holding musical instruments, and playing instruments according to tone and rhythm. This condition can be

caused by less interactive teaching methods. Based on an interview with Mr. Rumpoko, the extracurricular supervising teacher, some students tend to be less focused and enthusiastic when participating in band activities.

In addition, research by Putri and Suryani & Hardiyantari (2023) found that less interactive methods tend to make students feel bored, thereby reducing the effectiveness of learning, especially in extracurricular contexts that require direct practice.

However, after the Jigsaw model was applied in the first cycle, the average value of students' skills increased quite significantly to 71.96. This increase continued in the second cycle, with an average value reaching 76.94. These results indicate that the application of the Jigsaw learning model can have a positive impact on the development of students' skills in playing musical instruments such as drums, guitar, bass, keyboard, and vocals.

2. The Effectiveness of Applying the Jigsaw Learning Model in Improving Students' Skills in Band Extracurricular Activities at SMPN 34 Surabaya

The application of the Jigsaw learning model in the Band extracurricular at SMPN 34 Surabaya has proven effective in improving students' skills, both technically in playing musical instruments and in social skills such as cooperation and communication. The results of the study recorded in Table 4.8 show a significant increase in students' skills between the pre-cycle, cycle I, and cycle II. In the pre-cycle stage, the average student skills were at 54.12, which is relatively low. However, after the application of the Jigsaw model in cycle I, the average student skills increased to 71.96, with a difference of 17.84. In cycle II, although there was a slight decrease in the rate of increase (a difference of 4.98), the average student skills still showed a higher number, namely 76.94. This increase illustrates the effectiveness of the Jigsaw model in providing a sustainable positive impact on students' skills in the Band extracurricular.

The implementation of the Jigsaw learning model in the Band extracurricular of SMPN 34 Surabaya is effective in improving students' skills both technically and socially. This model allows students to learn through collaboration, build understanding actively, and develop social skills that are important for working in a team.

4. CONCLUSION

The conclusion of the study on the application of the Jigsaw learning model in band extracurricular activities at SMPN 34 Surabaya shows that:

1. The implementation of the Jigsaw learning model in the Band extracurricular at SMPN 34 Surabaya has been proven to improve students' skills. The observation results showed an increase in the average value of students' skills from 54.12 in the pre-cycle, to 71.96 in the first cycle, and 76.94 in the second cycle. This shows that the Jigsaw model is able to provide a positive impact in improving students' music playing skills gradually.

2. The implementation of the Jigsaw model is effective in helping students understand the material and improve their skills in playing music. Although there are some students who experience

obstacles or decline in skills in certain cycles, overall, the trend of improvement is still visible.

5. THANK-YOU NOTE

Thanks are addressed to all who support and support the author in the implementation and work of this research, starting from parents, family, friends and companions. So that this research can be carried out smoothly and the author becomes more enthusiastic.

6. REFERENCE

- Astiti, DKS, & Widiyana, IW (2017). Application of jigsaw learning method as an effort to improve science learning outcomes in grade IV elementary school students. *Elementary School Scientific Journal*, 1(1), 30-41.
- Firmansyah, H. (2024). Implementation of Cooperative Learning Model to Improve Critical Thinking Skills in Students in History Learning. *JIM: Scientific Journal of History Education Students*, 9(2), 524-532.
- Hasanah, Z., & Himami, AS (2021). Cooperative learning model in fostering student learning activeness. *Irsyaduna: Journal of Student Studies*, 1(1), 1-13.
- Hertiavi, MD, Langlang, H., & Khanafiyah, S. (2020). Application of jigsaw cooperative learning model to improve problem solving skills of junior high school students. *Indonesian Journal of Physics Education*, 6(1).
- Jusriani, D., & Muchlis, I. (2023). The Influence of the Jigsaw Type Cooperative Learning Model on the Subject of Aqidah Akhlak in Increasing Students' Interest in Learning at MTs Al Mustaqim Parepare. *Al-Ibrah: Journal of Islamic Education and Science*, 8(2), 1-29
- Respati, R., & Fuadah, U. S. (2018). Music Ensemble Learning for Upper Elementary School Students. *Indonesian Journal of Primary Education*, 2(1), 30-37.
- Rostika, D., & Junita, H. (2017). Improving problem-solving abilities of elementary school students in mathematics learning with the multi-representation (DMR) discourse model. *EduHumaniora | Journal of Elementary Education, Cibiru Campus*, 9(1), 35-46.
- Suryani, SM, & Hardiyantari, O. (2023). Development of Android-Based Interactive Learning Multimedia in Basic Subjects of Class X TKJ Expertise Program. *Indonesian Journal of Education and Technology*, 3(5), 223-232.