Cooperative Learning by Digital Jigsaw to Improve Learning Outcomes for Eight-Grade-Students

Imanti Galih Ayu P.P.[1], Ilaha Mammadova[2], Edi Sunjayanto Masykuri[3]

{gambatte05@gmail.com[1], ilaheayansayad7@gmail.com[2], esunjayanto@gmail.com3}

SMPN 1 Kesesi Kabupaten Pekalongan, Indonesia[1],
Azizbayov Secondary School, Azerbaijan[2],
English Education Program, Universitas Muhammadiyah Purworejo, Indonesia[3]

Abstract. This Guidance and counseling action research is motivated by the low average value of the student report cards of class VIII SMP Negeri 1 Kesesi, Kabupaten Pekalongan, Indonesia. This study aims to improve the achievement of learning outcomes through the classical service of recognizing learning style using the Jigsaw Cooperative method which was carried out in two cycles, each cycle carried out in two meetings. This research was conducted from August to September 2019, located in class VIII H odd semester of SMP Negeri 1 Kesesi, Kabupaten Pekalongan, Indonesia for the 2019/2020 school year. The type of research is Guidance and Counseling action research with two cycles consisting of two meetings in one cycle, each cycle consisting of planning, implementation, observation, and reflection. Based on the results of the study, the application of the Jigsaw Cooperative learning model in the classical service of Recognize Your Learning Style material can improve learning outcomes for subjects in class VIII H odd semester of SMP Negeri 1 Kesesi, Kabupaten Pekalongan, Indonesia for the 2019/2020 school year. It can be seen from the initial condition to the final condition that there is an increase in average learning outcomes. In the initial conditions, it only showed an average result of 68.67. In the first cycle it rose to 77.75, and in the second cycle it rose to 84.69. This shows an increase from the initial condition to the first cycle of 9.08 points, while from the initial condition to the second cycle there is an increase of 16.02 points. The results showed that the Jigsaw Cooperative learning model could create a fun and effective learning atmosphere so that student learning outcomes increased from the results of the first cycle to the second cycle. In the first cycle the number of students who got a complete score in learning was only 10 students, while there were 23 students who did not complete. In the second cycle, there was an increase in the score, which was 33 students who were complete in learning. It was concluded that the Jigsaw Cooperative method could improve the ability to identify students' learning styles.

Keywords: Learning outcomes; Learning style; Classical service; Jigsaw; Cooperative learning

1. Introduction

Successful education is the result of education that students can use in their lives. Therefore, at least education must empower all the abilities of students [1]–[3]. The ideal educational process is an educational process that is packaged by taking into account various aspects, both cognitive, affective, and psychomotor aspects. If the educational process can be carried out by taking into account the balance of these three aspects, the output of education will be able to translate and anticipate the progress and development of society that is running so fast [4].

Education must be able to provide a sense of comfort to students so that students do not feel pressured [5], [6]. Therefore, learning variations are needed so that the learning environment is always conducive, without limiting activities. The development of activities for students starting from the beginning will be able to form thinking habits that are very useful for students in the future [6]–[8] . This is where the professionalism of Guidance and Counseling Teachers is needed in carrying out their duties and functions to provide comprehensive services and according to the needs of students. Therefore, the government is always making improvements to the curriculum for the realization of quality students.

The revised 2013 curriculum for junior high schools has undergone changes and developments in accordance with the competencies needed by 21st century education which is increasingly advancing into the industrial era 4.0. Services in Guidance and Counseling lessons in junior high schools are also experiencing development, one of which is classical services in the field of tutoring. Classical service

materials in the field of learning Recognize Your Learning Style are very suitable to be applied in class VIII odd semesters, SKKPD Intellectual Development. This research was conducted in class VIII odd semester of SMP Negeri 1 Kesesi, Kabupaten Pekalongan, Indonesia, for the 2019/2020 school year.

When participating in teaching and learning activities, students tend to be passive, silent, and lack initiative. If this happens to students continuously, it will have bad consequences. Therefore, it must be addressed immediately. Based on the observations of researchers in the learning process, especially in certain subjects, students tend to be passive which results in the ability of students in these materials is still low. This can be seen from the results of the assessment through the Data Set obtained through the list of student scores on the subject teacher. Especially in the daily test scores, it turns out that students who have completed or fulfilled the KKM are 78, there are only 4 students (9.38%), while those who have not completed reached 29 students (90.63%) out of 33 students.

The low achievement of student learning outcomes is allegedly due to textual learning that places the teacher as the "center" in PBM and the inability of students to identify the right learning style for themselves. In addition, the development of "activity" for students is lacking because PBM is dominated by teachers. Teachers do not provide opportunities for activities to students.

In connection with the above background, the author tries to conduct guidance and counseling action research to try to overcome some of the obstacles that arise to grow student learning activities, so as to be able to shape students to master cognitive learning materials, affective, and psychomotor by developing all the abilities of students and providing learning experiences to students so that each learning is more meaningful for themselves through the application of the Jigsaw technique cooperative learning model in classical services.

According to Bloom, learning outcomes include cognitive, affective and psychomotor abilities. Cognitive domains are knowledge (knowledge, memory), comprehension (understanding, explaining, summarizing, examples), application (applying), analysis (descripting, determining relationships), synthesis (organizing, planning, forming new buildings) and evaluation (assessing) [9]. The affective domain is receiving (accepting attitude), responding (giving a response), valuing (value), organization (organization), characterization (characterization). The psychomotor domain includes initiatory, pre-routine and routinized. Psychomotor also includes productive, technical, physical, social, managerial, and intellectual skills [10].

The previous study was about the communicative learning [11]–[13], the various of cooperative learning [14], [15], and learning by digital platform [16]–[22] This study discusses efforts to improve student learning outcomes through classical services for Recognize Your Learning Style. Willing defines, "Learning style is a learning habit that is favored by learners" while Keefe views "learning style as the way a person accepts, interacts, and views his environment.". According to Bobby DePorter, a person's learning style is the key to developing performance at work, at school, and in interpersonal situations [23]. All definitions of learning styles above do not appear to be contradictory, but rather have similarities between one and another. The definitions of these learning styles seem to be substantially complementary. Based on the information above, the writer concludes that learning style Learning style is a person's way/habits in learning [24]. This learning includes absorbing knowledge and how to organize and process the information or knowledge obtained [21].

To improve student learning outcomes in subjects, students need to identify their learning style through classical service materials. Recognize Your Learning Style, the author uses the Jigsaw teaching technique. According to Lie Jigsaw teaching technique was developed as a cooperative learning method (Cooperative Learning) [25], [18], [26]. This technique can be used in teaching reading, writing, listening, or speaking. In this technique, the teacher pays attention to the schemata or background experience of students and helps students activate these schemata so that the lesson material becomes more meaningful. In addition, students work together with fellow students in a mutual cooperation atmosphere and have many opportunities to process information and improve communication skills [27].

Cooperative learning Jigsaw technique is a cooperative learning technique consisting of several members in one group who are responsible for mastering the learning material section and are able to teach the material to other members in the group [28]. The Jigsaw technique cooperative learning model is a cooperative learning model where students learn in small groups consisting of 4-6 people heterogeneously and work together with positive interdependence and are responsible for the completeness of the part of the subject matter that must be studied and convey the material to group members others [28].

Jigsaw is designed to increase students' sense of responsibility towards their own learning and the learning of others [29]. Students not only learn the material provided, but they must also be ready to

provide and teach the material to other group members. Thus, "learners are interdependent with one another and must work together cooperatively to learn the assigned material" [25]

2. Method

Cycle

This study uses classroom action research procedures by using two actions, namely cycle I and cycle II.

1. Cycle I

In the first cycle, the action taken was to apply the learning model with the Digital jigsaw technique with limited guidance by the teacher. Cycle I consists of 4 stages, namely:

1. Planning (planning)

At the planning stage, a service implementation plan (RPL) is prepared. The preparation of the RPL is also accompanied by the preparation of research instruments in the form of observation sheets (for teachers and students), LKPD (Student Activity Sheets), grids, questions and answer keys.

2. Acting (implementation)

At the implementation stage, the researchers carried out learning by applying the Digital jigsaw technique cooperative learning model as planned in the RPL.

3. Observing (observation)

The observing stage includes observing teaching and learning activities, both teacher activities and student responses during learning.

4. Reflecting

The reflecting stage includes reflecting on the learning outcomes of Guidance and Counseling subjects during the first cycle. In addition, the researchers also discussed the observations for improvement in the second cycle.

2. Cycle II

In cycle II, the action taken was to apply the Digital jigsaw technique learning model with directed guidance from the teacher. Cycle II consists of 4 stages, namely:

1. Planning (planning)

At the planning stage, a learning implementation plan (RPL) is drawn up. The preparation of the RPL is also accompanied by the preparation of research instruments in the form of observation sheets (for teachers and students), LKPD (Student Activity Sheets), grids, questions and answer keys.

2. Acting (implementation)

At the implementation stage, the researchers carried out learning by applying the Digital jigsaw technique learning model as planned in the RPL.

3. Observing (observation)

The observing stage includes observing teaching and learning activities, both teacher activities and student responses during learning.

4. Reflecting

The reflecting stage includes reflecting on the learning outcomes of students during the second cycle. For more details, can be seen in Figure 2 below.
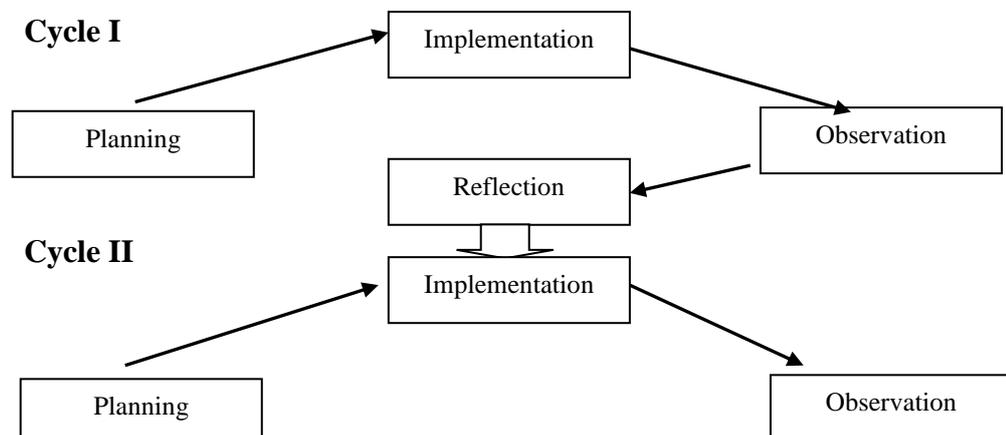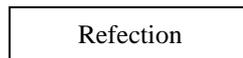
Figure 1. Action Research in two cycles

Sources

To obtain data, researchers used 3 techniques, namely:

1. Documentation Techniques
   Documentation technique is done to obtain data on initial conditions.
2. Observation Techniques
   In this study, the observation technique was carried out to obtain data about student activities in both cycle I and cycle II.
3. Test Techniques
   In this study, the test technique was in the form of a written test to obtain data about the learning outcomes of Guidance and Counseling subjects.

Data collection

The data collection tools/instruments used in this study are as follows.

1. Students' personal record documents are used to collect data on the learning process, namely student activities.
   To find out the achievement of learning outcomes in subjects, the data collection tool is in the form of a daily test score list.
2. Observation/observation sheet.
   Observation sheets were made for cycle I and cycle II.
3. Question points.
   Items are used for research techniques with test data.
   For data analysis, researchers used two ways, namely:
1. The value of learning outcomes for Guidance and Counseling subjects, the data were analyzed by comparative descriptive followed by reflection. Comparative descriptive that is comparing the value of learning outcomes from the initial conditions compared to the value of learning outcomes in cycle I and cycle II. Reflection is making conclusions based on comparative descriptive then giving a review and determining an action plan/follow-up.
2. The activities of students, the data were analyzed by qualitative descriptive then followed by reflection. Qualitative descriptive is to compare qualitative data on the ability to do activities in learning of students from the initial conditions, cycle I, and cycle II.

3. Findings

Cycle I

Cycle I was held in August 2019 in two meetings. Each meeting was held on a different day, namely for two days. The first meeting of cycle I was held on Saturday, August 10, 2019 for 1 x 45 minutes at the 3rd hour. The second meeting of cycle I was held on Saturday, September 14, 2019 for 1 x 45 minutes at the 3rd hour. While the evaluation of the first cycle was carried out on Saturday, August 10, 2019 for 1 x 45 minutes at the last hour (8th hour).

1. Apperception
   Cycle I was carried out in two meetings. As an apperception at meeting 1, the teacher asked students to reflect on their experiences in learning and participating in learning. At meeting 2, as apperception the teacher asks students to mention important things that must be in the job application letter.

2. Core activities
   According to the plan, cycle I was carried out in two meetings. At the first meeting, it is planned that the core activity begins with the teacher distributing student worksheets (LKPD) which contain classical service materials. Find Your Learning Style. The teacher explains the types of learning styles with the necessary explanations. The teacher forms a working group, by distributing expert code papers, the teacher also forms an expert group. The teacher makes a scenario of group formation. The material that students do is how to identify their learning style. The expert group in question is an expert in the field of context who has achieved complete subject

values. The end of the lesson is the presentation of one of the groups about the results of their work in identifying their learning style.

Cycle II

In Cycle I meeting 2, the core activities are planned to begin with the teacher distributing student worksheets (LKPD) containing teaching materials about Find Your Learning Style. The teacher explains the types of learning styles, the characteristics of people who have certain learning styles, successful learning strategies according to the learning styles of students with necessary explanations. The teacher forms a working group, by distributing expert code papers, the teacher also forms an expert group. The teacher makes a scenario of group formation. The expert group in question is from a group of students who have completed their KKM achievements, so that after students return to their original groups, they understand very well how the learning styles are in accordance with the characteristics of students. There was a sample group that gave presentations on learning strategies according to their respective learning styles.

Closing

The teacher asks the students their understanding of the learning style that suits them. The teacher gives emphasis by giving the necessary keywords to remember the types of learning styles, characteristics of learning styles, identification of learning styles and learning strategies according to their learning styles. After the second cycle of the first meeting, an evaluation of the first cycle was carried out, namely Saturday, September 14, 2019. A grid of questions, items, a list of student scores, and examples of student test results are attached.

After the implementation of the actions in cycle 1, the classical Guidance and Counseling service in class VIII H odd semester of SMP Negeri 1 Session for the 2019/2020 school year underwent changes. Based on the assessment through the data set of the daily test scores for the first cycle, the class average was 78.78 with the highest score of 90 and the lowest score of 70. From the evaluation results, there were 17 students (53.13%) whose scores had met the KKM. Meanwhile, 15 students (46.88%) whose scores have not reached the minimum completeness criteria (KKM) are 78.

Table 1. Cycle 1 Evaluation Result

No	Description	Score
1	The lowest	68
2	The highest	90
3	Average	77,78

Based on the table 1, it shows score of the daily test of the first cycle, if you look at the block diagram, it can be described as follows.
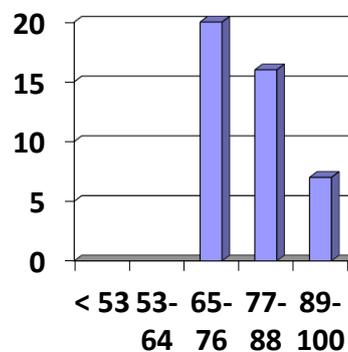
Figure 2. Diagram of Cycle I Evaluasi Evaluation Results

The table 4 is the daily test value data for cycle I if it is presented in a table interval.

Table 4 Cycle I Evaluation Value Interval

No	Interval	Frequency	Procentage
1	77 – 88	7	21,88
2	65 – 76	11	31,25
3	53 – 64	15	46,88
4	< 53	-	-
5	89 – 100	-	-
	Total students	33	100

Reflection

In the condition before applying the Digital jigsaw Cooperative learning model after being evaluated through evaluation, it turned out that it was only able to obtain a class average of 77.78 with details of students who completed only 18 students (53.13%) while those who had not completed reached 15 students from 33 students. students (46.88%). After taking action on the students, namely the application of the Digital jigsaw learning model, there was a change in the class average score of 77.78 with the highest score of 90 and the lowest score of 68. It turned out that there was an increase of 9.08 points.

Table 5 Reflection of learning outcomes Cycle I

No	Treatment in Cycle 1 After digital jigsaw	Assessment
2	The lowest	80
3	The highest	93
4	Average	78,78

The ability of students to identify their learning styles encourages the achievement of learning outcomes so that they increase. Students can learn effectively and fun according to their learning styles, although there are still some students who have not reached the KKM, from increasing the ability to identify these learning styles, an average score of 78.78 can be obtained with complete details of 18 students (53.13%) while 15 students have not completed (46,88%). From the results obtained by students in the first cycle, not all have reached the KKM, it is necessary to continue the discussion in the first cycle

Cycle II

Cycle II was held in September 2019. The implementation and time allocation in Cycle II was also the same as Cycle I, which was carried out for two meetings. Each meeting was held in two days. The first meeting of the second cycle was held on Saturday, September 17, 2019 for 1 x 45 minutes at the 3rd hour. The second meeting of the second cycle was held on Tuesday, September 14, 2019 for 1 x 45 minutes at the 3rd hour. While the evaluation of the second cycle was carried out on Saturday, September 14, 2019 during the last 1 x 45 minutes (8th).

Apperception

Cycle II is planned to be carried out in two meetings. As an apperception at meeting 1, the teacher asks students to mention what is meant by learning styles. At meeting 2, as apperception the teacher asked students to classify the types of learning styles.

Core activities

According to the plan, cycle II was carried out in two meetings. At the first meeting, it is planned that the core activity begins with the teacher distributing the student worksheets (LKPD) containing the material for Find Your Learning Style. The teacher explains the types of learning styles, characteristics of learning styles, and learning strategies according to learning styles with necessary explanations. The teacher forms a working group, by distributing expert code papers, the teacher also forms an expert group. The teacher makes a scenario of group formation. The materials that the students worked on were children's learning strategies with Auditory learning style for group A, children's learning strategies with Kinesthetic learning style for group B, children's learning strategies with Visual learning style for group C, and learning strategies for Linguistics children. The expert group in question is an expert in the context of achieving the Complete KKM score. The end of the service is a presentation of one of the groups on the results of their work in identifying learning strategies for certain learning styles.

In Cycle II meeting 2, the core activities are planned to begin with the teacher distributing student worksheets (LKPD) containing teaching materials about Learning Styles. The teacher explains the types of learning styles with the necessary explanations. The teacher forms a working group, by distributing expert code papers, the teacher also forms an expert group. The teacher makes a scenario of group formation. The expert group in question is from the field of KKM scores above the average, so that after students return to their home groups, they understand very well how to learn strategies with learning styles. A sample group gave presentations on strategies in learning using appropriate learning styles.

Closing

The teacher asks students again about their understanding in identifying learning styles. The teacher emphasizes by providing the necessary keywords to remember the characteristics of students with certain learning styles and strategies so that they can learn according to their learning styles. After the second meeting of cycle II, an evaluation of cycle II was carried out, namely Saturday, September 14, 2019. The grid of questions, items, student attendance lists, list of student scores, and examples of student test results are attached.

Observation Results

After the implementation of the actions in cycle II, the classical Guidance and Counseling service in class VII Odd semester of SMP Negeri 1 Kesesi, Kabupaten Pekalongan, Indonesia for the 2019/2020 school year underwent changes. Based on the data on the evaluation value of the second cycle, the class average was 84.69 with the highest score of 90 and the lowest score of 78. Of the 33 students, all of them had completed the minimum completeness criteria (KKM) of 78.

Tabel 6 Evaluation result in cycle II

No	Description	Score
1	The highest	78
2	The lowest	94
3	Average	85,69

Based on the table 6 the score of the second cycle of daily tests, if you look at the block diagram, it can be described as follows:
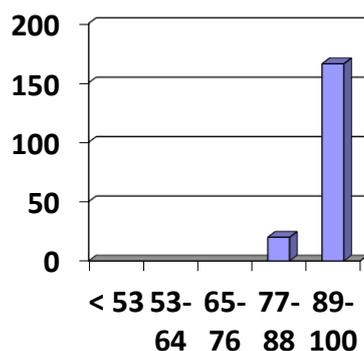
Figure 3 Diagram of Cycle II Evaluation Results

The following is the daily test value data for cycle II if it is presented in an interval table 7

Table 7 Interval of Evaluation result in cycle II

No	Interval	Frequency	Procentage
1	89 – 100	6	15,63
2	77 – 88	27	84,38
3	65 – 76	-	-
4	53 – 64	-	-
5	< 53	-	-
	Total Students	33	100

In the first cycle, applying the Digital jigsaw learning model after being evaluated through evaluation, it turned out that it was only able to obtain a class average of 77.75 with details of students who had completed 19 students (53.13%) while those who had not completed reached 14 students from 33 students. (46.88%). After the second cycle of action was carried out on the students, namely the application of the Digital jigsaw learning model, all students met the KKM. The evaluation results also showed a change in the class average score of 85.69 with the highest score of 94 and the lowest score of 78. It turned out that there was an increase from the first cycle of 6.91 points.

Table 8 the reflection in cycle II

No.	Treatment in cycle II After digital jigsaw	score
1	The lowest	78
2	The highest	94
3	Average	85,69

4. Discussion

There was two cycles, Cycle completed in two meetings. The core activity will begin by handing student worksheets including classical service elements at the first meeting, finding out how you learn best, providing the essential explanations for the different sorts of learning styles, establishing a working group and an expert group by distributing expert code sheets.
` The good teacher creates a group formation scenario. Students identify their learning style through the material. When they return to their original groups, they would have a clear understanding of how learning styles are related to student characteristics.There was a sample group that gave presentations on learning strategies according to their respective learning styles.
second meeting by two key activities. By explanations, the different types of learning styles, the characteristics of people and successful learning strategies based on the learning styles of pupils.
Cycle II completed in two meetings. The key activity for the first meeting is for the teacher to distribute the student worksheets containing the content for finding your own learning style. The teacher presents the different types of learning styles, their characteristics, and learning strategies based on learning styles. The teacher establishes a working group and establishes an expert group by distributing expert code sheets. The teacher creates a group formation scenario.

Children's learning strategies with Auditory learning style for group A, children's learning strategies with Kinesthetic learning style for group B, children's learning strategies with Visual learning style for group C, and learning strategies for Linguistics children were among the materials on which the students worked. The expert group in question is an expert in the context of achieving the Complete KKM score. The end of the service is a presentation of one of the groups on the results of their work in identifying learning strategies learning styles.

5. Conclusion

Based on the results of the study, it was concluded that through the application of the Digital jigsaw Cooperative model, it could increase the achievement of subject scores through classical guidance and counseling services in class VIII in the odd semester of SMP Negeri 1 Kesesi, Kabupaten Pekalongan, Indonesia for the 2019/2020 school year. From the initial condition to the final condition, there was an increase in learning outcomes from an average of 68.67 in the first cycle to 77.75 and in the second cycle it rose to 84.69, an increase of 16.02 points. There are some questions in the various communication and digital interaction section, with the highest mean of 30,6 percent. When it came to communication and interaction with the lecturer or student, the majority of them chose to disagree. That is to say, they do not enjoy conversing in an online classroom setting such as Zoom Meeting. In strongly agreed, the lowest mean is 2,3 percent.

6. Suggestion

Based on the results of research and discussion, the following suggestions can be put forward:
1. Students should be more active in teaching and learning activities by issuing opinions and asking questions. Group discussions also need to be carried out to increase the activity and achievement of student learning outcomes.
2. Teachers are expected not to be monotonous in delivering subject matter. The delivery of varied subject matter will attract students to be active in the learning process.
3. To increase the activeness of students and the achievement of learning outcomes in subject values, teachers should use the Digital jigsaw Cooperative learning model

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