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Improving Students' Problem-Solving Ability in the Concept of Tolerance through Problem-Based and Cooperative Learning in Islamic Education

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Abstract: *Problem-Based Learning (PBL) and Cooperative Learning (CL) methods have an important role in improving problem-solving abilities. In the PBL method, students are invited to face real problems with problem-solving skills in finding solutions. Meanwhile, in CL, students work in small groups and share knowledge to achieve deeper understanding. The aim of this research is for students to improve their problem-solving abilities through PBL and CL learning methods. This research is an experimental type with data collection techniques in the form of pretest and posttest in experimental classes 8A and 8B. Normality test data analysis uses Shapiro Wilk, while hypothesis testing uses independent and paired sample t-tests and N-gain tests. The results of this study show that the PBL and CL methods can improve students' problem-solving abilities with experimental class 8A (PBL) learning outcomes of 77.125%; while for experimental class 8B (CL) 71.490%. Meanwhile, the independent sample t-test showed that there were no significant differences in the pre-test and post-test learning results with ρ-value = 0.758 and 0.347 (>0.05). The conclusion in this research is that there is no significant difference in problem-solving abilities in the concept of tolerance through PBL and CL. Furthermore, the implications of this research emphasize real problems that require a tolerant approach. This research recommends teachers in implementing an important learning model by using case studies about interreligious conflicts in society and how to apply the principles of tolerance in resolving these conflicts.*
Keywords: *Problem Based Learning (PBL); Cooperative Learning; problem solving abilities*.

Meningkatkan Kemampuan Pemecahan Masalah Siswa pada Konsep Toleransi melalui Pembelajaran Berbasis Masalah dan Kooperatif dalam Pendidikan Agama Islam

Abstrak: Metode Problem Based Learning (PBL) dan Cooperative Learning (CL) memiliki peran penting dalam meningkatkan kemampuan pemecahan masalah. Dalam metode PBL, siswa diajak untuk menghadapi masalah nyata dengan kemampuan pemecahan masalah dalam mencari solusi. Sementara itu, dalam CL, siswa bekerja dalam kelompok kecil dan saling berbagi pengetahuan untuk mencapai pemahaman yang lebih dalam. Tujuan dari penelitian ini adalah agar para siswa dapat meningkatkan kemampuan pemecahan masalah melalui metode pembelajaran PBL dan CL. Penelitian ini berjenis eksperiment dengan teknik pengumpulan data berupa pretes serta postest pada kelas eksperiment 8A dan 8B. Analisis data uji Normalitas menggunakan Shapiro Wilk, sedangkan uji hipotesis menggunakan uji independent dan paired sample t-test, dan uji N-gain. Hasil pada penelitian ini menunjukkan bahwa metode PBL dan CL dapat meningkatkan kemampuan pemecahan masalah peserta didik dengan perolehan hasil belajar kelas eksperiment 8A (PBL) 77,125%; sedangkan untuk kelas eksperiment 8B (CL) 71,490%. Sedangkan uji independent sample t-test menunjukkan hasil belajar pre-test dan post-tetst tidak terdapatnya perbedaan yang signifikan dengan ρ-value = 0.758 dan 0,347 (>0,05). Kesimpulan dalam penelitian ini adalah tidak terdapat perbedaan yang signifikan pada kemampuan pemecahan masalah dalam konsep toleransi melalui PBL dan CL. Selain itu implikasi penelitian ini menekankan pada masalah-masalah nyata yang memerlukan pendekatan toleransi. Rekomendasi penelitian ini guru dalam mengimplementasikan model pembelajaran penting dalam penggunaan kasus studi tentang konflik antaragama di masyarakat dan bagaimana menerapkan prinsip-prinsip toleransi dalam menyelesaikan konflik tersebut.
Kata Kunci: Problem Based Learning (PBL); Cooperative Learning; kemampuan pemecahan masalah.

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1. Introduction

Religious moderation is an attitude that exists as a form of living side by side with viewpoints and practices in daily life. According to UNESCO, tolerance is an attitude of mutual respect, appreciation, acceptance of differences, and freedom of expression. Meanwhile, Lukman, chose the word "balanced" as a basic principle of moderation, with the meaning of always siding with justice, humanity, and equality, then also "wasathiyah" is taking the middle path as a characteristic of religious teachings (Pajarianto et al., 2022). So religious moderation can also be said to be a way of forming a person into a moderate religion, meaning understanding and practicing religious teachings without going to extremes (radicalism or liberalism). So this can be interpreted as a balanced action for the sake of creating peace. By implementing religious moderation in daily life, one will be able to improve one's religious quality through mutual respect for differences. Therefore, it is important to apply a moderate attitude in responding to increasingly complex differences (Nasir & Rijal, 2021).

So what will happen if moderation is not implemented? In several cases, such as in Papua, there was an incident called Tolikara, namely an incident of destruction of a Muslim place of worship while it was being used for Eid prayers in 2015. A similar case also occurred in Aceh Singkil where the church was burned because there was a group of people who refused to build the church. as a place of worship for Christians (Naim et al., 2022). Apart from these incidents, there are still incidents that do not symbolize Islamic moderation and morality, such as brawls between students, immoral behavior, and lack of harmonization between adherents of schools of Islamic jurisprudence and political thought (Subchi et al., 2022).

In terms of teaching moderation in the community environment, it is greatly influenced by educational factors, including the Islamic Religious Education (PAI) subject. This is because PAI is a form of religious education and there is material that specifically discusses moderation, this could be one of the reasons why religious education is crucial to implement (Ropi, 2019). However, despite this, PAI education is also experiencing several problems that can affect the quality and results of education, such as weak student motivation for PAI education. So this will have an impact on the low achievement of PAI's KKM (Minimum Completeness Criteria). According to Maulidina and Al-Fathi, one of the causes of the low quality of education is the use of monotonous learning methods, making students less active and creative. The learning method itself is a way of learning with a plan prepared and implemented in the learning process to achieve the desired goals. Based on 2015 data, the average ability of teachers in pedagogical skills based on competency tests is 56.69% (Syahnan & Ja'far, 2021).

Therefore, to increase literacy in learning methods, we will research two different learning methods, including the PBL (problem-based learning) method and the cooperative learning method. By using class 8 (eight), there are 2 (two) classes at SMPN 2 NGARIBOYO, with the division of class 8A using the PBL method while 8B uses the Cooperative Learning (CL) method. By finding or researching which of the two methods is most effective. The PBL learning method is a problem-based method, with students developing problem-solving abilities from real-world problems. The PBL learning process will encourage students to think critically to solve problems based on authentic problems, and also provide an interesting atmosphere for students so that the atmosphere in the class will not seem monotonous (van der Vleuten & Schuwirth, 2019). In this PBL method, there are five elements in the learning process, including student-oriented problems, designing the learning process for students, conducting learning in groups or individually, criticizing and developing students' work to be better, and assessing students in solving a problem. According to Ngalimun, problem-based learning provides students with the opportunity to solve problems using scientific steps, this will provide a way for them to develop real problem-solving abilities. According to Moffit, PBL or problem-based learning must use real-world problems as problems for which answers or solutions are sought, with students thinking critically and developing their understanding of the problems and basic ideas of a subject (Hu et al., 2019). It is hoped that this PBL-based learning method will increase students' scientific literacy by using authentic investigations to increase students' understanding and motivation in learning.

Apart from the PBL method, there is also the Cooperative Learning (CL) method. The CL method is a learning approach that involves collaboration between students in achieving learning goals. In CL, students work in small groups consisting of members with different abilities and backgrounds. Each group member has complementary roles and responsibilities to achieve the desired results (Setiana et al., 2020). CL implementation can provide many benefits for

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students. First, CL can increase student motivation and participation in learning. In groups, students feel more motivated to learn because they feel they have a responsibility to their group. They also participate more actively in discussions and group activities. Second, CL can improve students' understanding of lesson material. In groups, students can help each other understand difficult concepts. They can share knowledge, provide explanations, and correct each other if there are errors in understanding. Third, CL can develop students' social skills. In groups, students learn to work together, listen to other people's opinions, and appreciate differences. They also learn to deal with conflict constructively and build harmonious relationships with other group members. Fourth, CL can improve students' problem-solving abilities. In groups, students are invited to think critically, argue, and find the best solution. They learn how to integrate ideas from other group members to achieve optimal results (Namaziandost et al., 2019).

This research aims to improve students' problem-solving abilities through the application of Problem-Based Learning (PBL) and Cooperative Learning (CL) learning methods in Islamic Religious Education (PAI). Hopefully, this research can show the effectiveness of these two methods in helping students understand the concept of tolerance and apply it in everyday life. The benefits of this research include contributing to the development of more effective learning methods, increasing students' understanding of religious tolerance to support inter-religious harmonization, providing empirical data for educators in selecting appropriate learning methods in the context of Islamic Religious Education, as well as developing social and work skills, with students through group-based learning.

2. Research Methods

This research uses the concept of experimentation as the research process. The sampling was carried out at SMPN 2 Ngariboyo using classes 8A and 8B as experimental objects. In this research plan, there are two classes, namely class 8A which uses the PBL method, and class 8B uses the CL method. Next, to obtain data related to this research, the researcher carried out a pre-test and post-test on the research objects (students 8A and 8B). The pretest is used to assess students' initial abilities before being given learning process treatment, while the posttest is used to assess students' problem-solving abilities after being given learning process treatment (Heru et al., 2021). The research design are shown in Table 1.

Table 1. Research Design

Group	Pretest	Treatment	Posttest
Experiment 8A	O1	X1	O2
Experiment 8B	3	X2	O4

Description:
O1 : Pretest given to experimental class 8A
O2 : Posttest given to experimental class 8A
O3 : Pretest given to experimental class 8B
O4 : Posttest given to experimental class 8B
X1 : The treatment given in experimental class 8A uses PBL
X2 : The treatment given to experimental class 8B uses Cooperative Learning

Testing the validity of the pretest and posttest instruments is the first step in this research. In calculating validity, the product moment method is used to compare the r-table and r-calculated values. The results of the validity test using 20 questions for the pretest and posttest showed that all 20 questions were declared valid. The decision was taken based on the calculated r value obtained between 0.560-0.783, so that the calculated r was more than the r table (>0.361; N=31). The reliability test uses the Cronbach alpha method with CA results of 0.870 to 0.887, so the CA is greater than 0.70. Thus, the pretest and posttest question instruments are considered reliable. Researchers carried out a normality test using the Shapiro-Wilk test. This was done because the respondents in this study had less than 50 respondents from each experimental class (Arga et al., 2022). The pre-test and post-test instrument are shown in Table 2.

In this experimental research, researchers used measurement instruments using a pretest and posttest. The pretest and posttest measurement instruments carry out various tests such as validity tests and reliability tests (Novita et al., 2022), (Supriyanto et al., 2022). Then the next step is to carry out normality tests and hypothesis testing. The formulation of the independent sample T-Test hypothesis (H1 & H2) is that there is a significant difference in problem-solving abilities between the comparison of Problem-Based Learning (PBL) and Cooperative Learning (CL) learning methods. Meanwhile, the formulation of the paired sample T-Test hypothesis (H3 & H4) means that there are significant differences in problem-solving abilities in the Problem-Based Learning (PBL) and

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Cooperative Learning (CL) learning methods. The N-gain score analysis is interpreted based on 4 categorizations, namely <40 = not effective, 40-55 = less effective, 56-75 = quite effective, and ≥76 = effective (Nuraini et al., 2022), (Daryono et al., 2024).

Table 2. Pre-Test and Post-Test Instrument Grid

Basic competencies	Indicator	Pre-test	Post-test
Understand and understand the concept of religious tolerance and social life	Know the meaning of tolerance and related things	1, 2, 3, 10, 11, 15, 18	4, 8, 13, 14
	Know the Procedures for Exercising Tolerance	4, 12, 17	2, 11
	Knowing the Wisdom in Implementing Tolerance	9, 14, 16	1, 9, 18, 20
	Understanding Tolerance Behavior in Everyday Life	13, 19	3, 15
	Know the application of tolerance	5, 8, 20	5, 6, 12, 16, 17, 19
	Able to assess problems while also applying tolerance in the solution	6,7	7, 10

3. Results and Discussion

The problem-solving abilities of classes 8A and 8B were obtained by pretesting (before experimenting), after which the researcher gave treatment to experimental classes 8A and 8B in the learning process. With 8A using the PBL method and 8B using the Cooperative Learning method, learning activities are carried out as usual starting with opening activities, core activities, and final activities. Posttests are given on the last day of the learning process, to determine student progress after being given treatment. The following is a table of pre-test and post-test learning results for class 8A and 8B students. Table 3 shows experimental results for classes 8A and 8B (pretest and posttest).

Table 3. Experimental Results for Classes 8A and 8B (Pretest and Posttest)

Student Code	Learning outcomes		Student Code	Learning outcomes	
	Pretes	Posttes		Pretes	Posttes
EA-01	35	45	EB-01	50	85
EA-02	25	50	EB-02	55	70
EA-03	15	35	EB-03	55	70
EA-04	25	60	EB-04	30	40
EA-05	50	60	EB-05	15	25
EA-06	35	50	EB-06	25	35
EA-07	30	50	EB-07	10	60
EA-08	40	75	EB-08	25	35
EA-09	20	65	EB-09	50	60
EA-10	35	75	EB-10	35	75
EA-11	55	65	EB-11	40	60
EA-12	20	50	EB-12	25	40
EA-13	40	70	EB-13	45	65
EA-14	45	55	EB-14	25	35
EA-15	45	75	EB-15	30	60
EA-16	10	55	EB-16	40	45
EA-17	45	80	EB-17	55	65
EA-18	50	85	EB-18	35	80
EA-19	40	60	EB-19	40	75
EA-20	45	65	EB-20	25	75
EA-21	25	55	EB-21	40	50
EA-22	35	50	EB-22	35	80
EA-23	35	45	EB-23	40	75
EA-24	50	75	EB-24	35	40
EA-25	30	40	EB-25	25	40
EA-26	40	75	EB-26	45	70
EA-27	70	85	EB-27	50	60
EA-28	20	35	EB-28	50	70
EA-29	50	65	EB-29	20	35
EA-30	45	75	EB-30	15	25
			EB-31	45	65

The information in Table 3 (three) explains that experimental class 8A students experienced increased learning outcomes, with tolerance material in Islamic Religious Education. Experimental class 8A uses the PBL method in the learning process and its progress is assessed using Pretest and Posttest by comparing the results to obtain the development of learning outcomes. Meanwhile, problem-solving abilities in experimental class 8B showed an increase in problem-solving abilities, with the posttest results being greater than the pretest results.

The normality test is a statistical procedure used to test whether data taken from a population or sample comes from a normal distribution or not. In experimental research, normality tests are often important to ensure that the data analyzed meets the basic assumptions of some statistical methods. The method commonly used to test normality is the Shapiro-Wilk Test statistical test which tests the null hypothesis that the sample comes from a normal distribution. It is often used for small samples (less than 50 samples). The Shapiro-Wilk test is a statistical method used to test the distribution of data. This test is used to test whether the data sample comes from a normally distributed population. In experimental class 8B, the

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Cooperative Learning method is used as the learning method. Then, based on the number of respondents from the two experimental classes, namely 8A (31 respondents) and 8B (30 respondents), it was found that each class had less than 50 respondents. Table 4 shows the shapiro-wilk normality test.

Table 4. Shapiro-Wilk Normality Test

Treatment	Class	Shapiro-Wilk		
		Statistic	df	Sig.
Pre-test	class 8A	,974	30	,652
	class 8B	,954	31	,204
Post-test	class 8A	,958	30	,270
	class 8B	,924	31	,051

The information in Table 4 (four) shows that the significance of the experimental results for the class 8A Pretest, 8B Pretest, 8A Posttest, and 8B Posttest is greater than >0.05 so that the data is normally distributed. With the achievement of class 8A Pretest significance of 0.652; 8B Pretest 0.204; 8A Posttest 0.270; 8B Posttest 0.051. Based on the results of the normality test analysis using the Shapiro-Wilk test, it can be concluded that the data used in this research has a normal distribution. Next, the next step is to carry out an Independent Sample t-test to evaluate whether there are significant differences in learning outcomes between students who use the Problem-Based Learning learning model and students who use the Cooperative Learning learning model.

The Independent Sample T-Test is a statistical tool commonly used in experimental research to compare the means of two statistically different groups. This test is suitable for use when you want to find out whether there are significant differences between two groups in terms of a certain dependent variable. This test aims to understand that the results of the Independent Sample T-Test can only provide information about the difference in averages between two groups, but do not provide information about cause-and-effect relationships or clinical effects. The results of the independent sample t-test are shown in Table 5. Based on Table 5 (five), shows that there is no significant difference in learning outcomes between experimental classes 8A and 8B, with Sig. (2-tailed) greater than >0.05. The score obtained for the PRE_PBL_CL class was 0.758; while the score for the Post_PBL_CL class was 0.347. Table 5 shows the independent sample t-test.

Paired Samples T-Test is a statistical tool used in experimental research to compare the means of two groups. This test is used when you want to find out whether there are significant differences between two conditions or different times in the same group. Review the output of the T-Test to determine if there are significant differences between two conditions or times. Focus on the resulting p-value values, if the p-value is smaller than a predetermined significance level (usually $\alpha = 0.05$), then you can reject the null hypothesis and conclude that there is a significant difference between the two conditions or time. This test is intended only to provide information about the differences between two conditions or times within the same group. The information in Table 6 (six) shows that there are differences in the learning outcomes of pre-test and post-test Islamic Religious Education with the known sig value. (2-tailed) of 0.000<0.05. With pair 1 and pair 2 having the same sig. (2-tailed) 0.000. Table 6 shows the paired sample t-test.

Table 5. Independent Sample T-Test

Class	t-value	Sig. (2-tailed)	Decision
Pre_PBL_CL	0,31	0,758	Rejected
Post_PBL_CL	0,95	0,347	Rejected

Table 6. Paired Sample T-Test

Class		t	df	Decision
Pair 1	pretes 8A postes 8A	-11,848	29	Accepted
Pair 2	pretes 8B postes 8B	-8,471	30	Accepted

It is important to note that the N-gain test has certain advantages and disadvantages. An advantage is the ability to assess changes in comprehension, but it should be noted that the results may be influenced by external factors and individual variability in the sample. Based on the information in Table 7 (seven), the average N-gain score test value for experimental class 8A (PBL method) is 77.125%. Where this value is included in the effective category with results of more than >76. Meanwhile, the average N-gain score for experimental class 8B (cooperative learning method) obtained a value of 71.490%. This falls into the quite effective category, with results between 56-75%. So, it can be concluded that the PBL method is more effective than the Cooperative Learning method in improving student learning outcomes in Islamic Religious Education subjects with moderated material in grade 8 at SMPN 2 Ngariboyo in 2023. Table 7 shows the N-gain test.

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Table 7. N-gain test

Experiment	Class	Gain Percent	Category
8A	PBL	77,125%	Effective
8B	Cooperative Learning	71,490%	Effective enough

This research was conducted at SMPN 2 Ngariboyo where researchers used PBL and CL methods, as learning methods in grade 8 (eight). It was found that the experimental class 8A (PBL) learning results were effective, with a gain percentage of 77.125%. Meanwhile, for experimental class 8B (CL), the results were quite effective, with a gain percentage of 71.490%. This shows that the pretest and posttest comparison is significant or that effective learning results are obtained. PBL and CL learning methods have several advantages that can increase the effectiveness of the learning process. The PBL method provides an active and student-centered learning experience. In this method, students are given a problem or challenge that they must solve through discussion, research, and group work. This allows students to develop critical thinking, creativity, and problem-solving skills (Saqr & Alamro, 2019). Apart from that, the PBL method also teaches students to work in teams, communicate well, and respect other people's opinions. Thus, the PBL method helps students to develop social skills that are important in real life (Trullàs et al., 2022).

In implementing the PBL method to improve students' problem-solving abilities in Islamic Religious Education (PAI) subjects. From the teacher's perception, the implementation of the PBL method can provide several expected results in improving students' problem-solving abilities in Islamic Religious Education (PAI) subjects. In PBL, students will be involved in solving problems that are relevant to the context of everyday life. This will help them understand PAI concepts better and be able to apply them in solving real problems (Zhao et al., 2020). Through PBL, students will be trained in identifying problems, analyzing situations, and finding appropriate solutions. They will learn how to gather information, analyze data, and make decisions based on religious values. This will improve students' problem-solving skills in the PAI context (Ali, 2019).

With the PBL method, students will be encouraged to think creatively and innovatively in finding solutions to the problems they face. They will learn how to think outside the box, look for alternative solutions, and develop new ideas that can address problems in more effective ways (Servant-Miklos, 2019). This will increase students' creativity and innovation in solving PAI problems. In PBL, students will be the main actors in the learning process. They will have an active role in determining the problem to be solved, seeking information, and developing solutions. This will increase student involvement in PAI learning and make them more responsible for problem-solving. Through PBL, students will be trained in critical thinking in analyzing problems, evaluating existing solutions, and making decisions based on careful consideration (Sari et al., 2021). This will improve students' critical thinking skills in the PAI context.

Through the implementation of the PBL model, it is hoped that students can develop better problem-solving abilities in PAI subjects. These results will help them in facing daily life challenges and situations related to religious values and religious life (Malmia et al., 2019). So by implementing the PBL model, students will be actively involved in the learning process, improve problem-solving abilities, and gain a deeper understanding of PAI subjects. Teachers' perceptions about the effectiveness of the PBL model in improving students' problem-solving abilities can also be a guide in developing and improving learning methods in the future (Khasanova, 2023).

The CL method provides opportunities for every student to be actively involved in learning. They have roles and responsibilities in the group, so they feel more involved and responsible for their learning. This can increase students' motivation and interest in learning PAI. By presenting solutions in mixed groups, students will have the opportunity to practice public speaking and convey their ideas. This will improve students' presentation and communication skills (Ridwan et al., 2022). Through the implementation of the CL method, it is hoped that students can develop better problem-solving abilities in PAI subjects. These results will help them in facing daily life challenges and situations related to religious values and religious life (Alwi et al., 2021).

These two methods have different but complementary advantages. The PBL method allows students to develop critical thinking and problem-solving skills (Seibert, 2021). Meanwhile, the CL method teaches students to work in teams and teach each other (Nurhasanah et al., 2020). These two methods can also increase students' motivation and interest in learning because students are actively involved in the learning process and feel responsible for their learning. So, it can be concluded that the PBL and CL methods have advantages that can increase learning effectiveness. The PBL method develops critical thinking and problem-solving skills, while the CL method teaches

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students to work in teams and teach each other. These two methods provide an active learning experience and fully involve students in the learning process. By applying these two methods, it is hoped that students can achieve better understanding, develop social skills, and become independent learners.

Supporting factors in the learning process in experimental classes 8A and 8B have various similarities. Where students have a supportive learning environment, and learning resources, and are emotionally prepared. The learning environment at SMPN 2 Ngariboyo is very adequate in the learning process, because the school and classes always maintain the cleanliness and comfort of the students, especially in carrying out the learning process. Then for learning resources, students have a variety of adequate learning resources such as textbooks, teaching modules, libraries, and even in terms of technology such as cell phones. So, finding information related to learning is very easy and adequate. In terms of emotions, the students were quite ready to receive learning material related to moderation, even in the previous semester before conducting research the students had been given this moderation material.

There are several inhibiting factors in implementing the learning process in experimental classes 8A and 8B. The inhibiting factor in implementing the learning process in experimental class 8A using the PBL method is the lack of order and student norms or etiquette in the learning process. Where in class 8A, in terms of lack of student orderliness, students are still often late in entering class when they have entered the learning hour with approximately 5-15 minutes of delay and there are 2 (two) students at the third meeting who do not attend the lesson for no reason. clear. Meanwhile, in terms of student norms or etiquette in the learning process, it was still found that some students were playing with cellphones which had nothing to do with the learning process. Apart from this, there was also 1 (one) student at the second meeting who was not allowed to enter the class because there was an event representing the school. Meanwhile, for experimental class 8B with the CL method, the inhibiting factors are almost the same as experimental class 8A, but there are several differences in terms of order. In terms of order in class 8B, 2 (two) students did not attend the lesson at the second meeting for no clear reason.

4. Conclusions and Suggestions

From the research results obtained, it can be concluded that the students' problem-solving abilities experienced a significant increase. This can be seen in the results of teaching and learning using the PBL method and Jigsaw type Cooperative Learning. With the increase in learning outcomes for experimental class 8A (PBL method), it reached 77.125% (effective). Meanwhile, the increase in learning outcomes for experimental class 8B (CL method) reached 71.490% (quite effective). These results were obtained using sample data collection techniques in the form of pretest and posttest. Based on the research data above, it can be concluded that the PBL method and CL method are equally effective in the learning process, depending on how educators can put advantages and disadvantages into positive potential. This learning method can be further developed into learning themes and at the class level of the students. So that interesting and fun learning can be formed in the learning process.

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