

# The comparison of homogenous and heterogenous group in applying jigsaw method

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Received: March 28, 2020; Revised: April 28, 2020; Accepted: April 29, 2020

## Abstract

Jigsaw is a kind of cooperative learning methods. This method has been known as an effective method in schools either for junior or college students. This study aims to describe the differences between two groups, that are one group formed based on gender, ability, ethnic and another group formed as a homogenous. Both of groups were applying jigsaw method in educational psychology course. The research method was comparative design. The subject of this study are all students who enrolled in educational psychology course. The result of this study is the effectivity of both groups formed in the jigsaw method has no significant difference. So, to conclude this research, teachers in schools should more concern in group dynamic than the component of groups

**Keywords:** *jigsaw, heterogenous and homogenous group*



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## Introduction

Jigsaw is one of the cooperative learning methods (Johnson & Johnson, 2011; Slavin, 1988). This method emphasizes on student activities in the group setting. Jigsaw is facilitating students to learn from each other and learn together from the teacher. This method encourages students actively involved in the learning activity, so the students gain an insightful understanding (Baharun, 2015; Kumara, 2004). The role of the teacher in this learning method not as learning resources but as a facilitator (Gillies & Ashman, 2003).

By encouraging the student to learn from each other, this method pushes the student to interact in the social environment. They will discuss, question, confronting that will help them gain communication skills. So, by implementing the Jigsaw method in class it not only helped a student gain insightful understanding but also train them social skills (Pateşan, Balagiu, & Zechia, 2016).

The procedure of the Jigsaw method is first by dividing students into 4-5 groups. The important step in this procedure is to divide students heterogeneously. Generally based on gender, ability, and ethnicity (Johnson & Johnson, 2011; Macpherson, 2015; Slavin, 1988). Secondly, the teacher share material for each group, then the group will discuss the materials. When the member of groups understood about the subject that had to discuss then they will go

to the other groups and share the knowledge that they gain from their own group. Lastly, after the groups share information about their topics, the teacher will give a review of the topics.

Jigsaw method has been famous because it is effective so that teachers at school suggested to implement it. But sometimes they have difficulties how to create a group based on heterogeneity. They create a discussion group without considering the composition of the group. The members of the group did not divided based on ability, gender, and ethic.

I conducted a simple survey of the 10 teachers in University about how my colleague divided discussion groups in their class with the Jigsaw method is applied. The result is they divided the class into a small circle by offering the student to be in a group with their mate. It means the member of the discussion group did not heterogeneous.

Many studies found that the jigsaw method is effective to help the student learning and practicing social skills, even though the members of the group are homogeneous (Neno & Erfiani, 2018; Nurbianta & Dahlia, 2019; Oakes, Hegedus, Ollerenshaw, Drury, & Ritchie, 2019). The studies confirm that the composition of the group did not influence learning outcomes.

The goal of this study is to comparing two group in applying jigsaw method. The heterogeneous group is the group that divided by making a composition within members based on their ability, gender, and ethnicity. The result of this study can be used as a consideration in applying jigsaw method in schools.

## Method

The research method in this study was a comparative quantitative method with an independent subject (Creswell, 2002). The subject of this study are all students from different two classes. One class consist of a group of students with different abilities, different academic background All students were participating in discussion class with jigsaw method.

In the experiment group, the jigsaw method was implemented by divided the groups based on ability, gender, and ethnicity. One group, the members of the discussion group are a student with good ability, a student from different academic backgrounds and different gender. The other group, the jigsaw method was applied but the group was not divided based on their ability, gender, and ethnicity. The location of the study was at Universitas Negeri Yogyakarta. The population of the study was a student in the third semester who attended the Educational Psychology course. They are from the natural science department, primary school department and biological. The learning procedure in the jigsaw method described in Table 1.

Tabel 1. Jigsaw Learning Method Procedure

No.	Homogeneous Group	Heterogeneous Group
1.	-	Data collection, comprise gender, ethnicity, grade-point index
2.	Discussion group making by ask the student to volunteer join to a group.	Discussion group making by dividing student based on the ability, gender, and ethnicity. Each group has members with good ability, lack ability, men, women, and from different ethnicity.
3.	The teacher shares a different topic for each discussion group and giving some materials about the topic.	The teacher shares a different topic for each discussion group and giving some materials about the topic.
4.	The students discuss the topic in the group and seek more information about the topic.	The students discuss the topic in the group and seek more information about the topic.
5.	The members in the group equalize what they had learned then they have the same perception about the topic.	The members in the group equalize what they had learned then they have the same perception about the topic
6.	The members of the first group be an expert. They have to share their knowledge from their group to the other group. Example The first group has a topic about cognitive-developmental. In their group, they discuss and seek more information about cognitive-developmental so that they become an expert in the cognitive-developmental topic. Then each member from group 1 comes to the other group, explaining cognitive-developmental until other groups understand cognitive development.	The members of the first group be an expert. They have to share their knowledge from their group to the other group. Example The first group has a topic about cognitive-developmental. In their group, they discuss and seek more information about cognitive-developmental so that they become an expert in the cognitive-developmental topic. Then each member from group 1 comes to the other group, explaining cognitive-developmental until other groups understand cognitive development.
7.	Teacher gives feedback about the topic	Teacher gives feedback about the topic
8.	Evaluation	Evaluation

The data in this study was obtained from the post-test evaluation. The researcher was using a questionnaire which consists of 40 item multiple-choice questions of Educational Psychology materials. This evaluation was conducted by the end of the semester.

Another data was collected from assessing student group tasks such as paper and quiz. the final score of the student is the average score of the quiz, paper and end semester evaluation.

The final score from the experiment group and the control group was compared. The comparison of the score is the final data of this research. the final data was analyzed statistically using an independent sample T-test. From this analysis, we obtain the average score and the sig. 2 tailed scores. The average score and sig. 2 tailed scores decide the result of this study.

### Findings and Discussion

Form this study, we got the average score and sig. 2 tailed scores in Psychological Education course educational natural science departments and educational biological science departments. Average score and sig. 2 tailed scores are in table 2.

Tabel 2. Average score and sig. 2 tailed scores

Kelas	Rerata (mean)	Sig. 2-tailed
heterogeneous	80.1	0.466
homogenous	78.3	0.452

The average score heterogeneous group is higher than the average score of the homogenous group. The average score of the heterogeneous group is 80,1. The average score of another group is 78,3. The sig. 2 tailed score is 0,466 and 0,452. The score is more than 0,05 so the result is the difference in learning outcome of two different groups was not significant. So, from this study, we found that the composition of the group in applying the jigsaw method not significantly important. Groups in the jigsaw method both homogeneous and heterogeneous are effective in the learning process.

This study found that the student understanding of the topic is affected by the interaction of the students. This is a point of how cooperative learning methods applied. This study found that the interaction between a student in the group is still effective although the members of the group are homogeneous. The member of the homogeneous group makes the student learning in a cozy circle.

Even though the differences in the effectivity of heterogeneous and homogeneous group is a bit. But, from this study, we can't overlook the average score of heterogeneous groups is more than the average score of homogeneous groups. This means that the jigsaw method more effectively applied with groups that divided based on gender, ability, and ethnicity. The applying jigsaw method with the heterogeneous group had been proven effective in schools (Adimassana & Rusmawan, 2016; Halimah & Sukmayadi, 2019; Holloway, Tilleman, Macy, Parkman, & Krause, 2008; Kolanczyk & Arif, 2017; Poloju, Rollakanti, & Manchiryal, 2018; Syahputra & Suhartini, 2014). This is important for us to be more considerate about how we grouping the student in the class because the interaction between a student in the group is better in the heterogeneous group than in the homogeneous group.

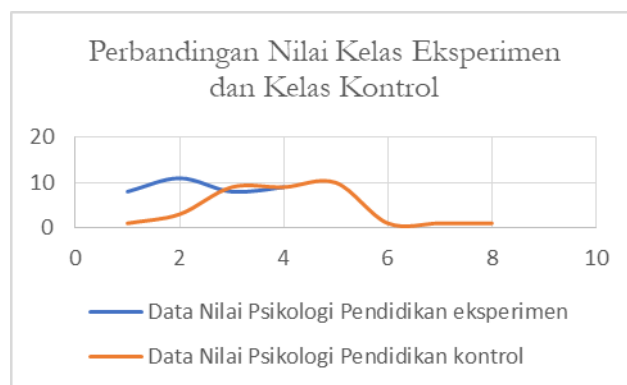
The data about the range of the score form this study is important. The data of the range score is in table 3.

Tabel. 3 The range score of two groups educational psychology course

Score Range	Total student	
	homogenous	heterogeneous
86-88	8	1
83-85	11	3

80-82	8	9
77-79	9	9
74-76		10
71-73		1
68-70		1

The graphic of the range score of the Educational Psychology course is in picture 1.



Picture 1. The graphic of comparison of the score of the educational psychology course

Table 3 and Picture 1 display the range of the score of educational psychology course. In the experiment group, the range of the score is 77-88. The range of the score in the control group is 68-88. In the control group, the class that the discussion group is homogeneous has a lower score than in the experiment group. The inference from this data is that the heterogeneous group more effective than the homogeneous group in applying the jigsaw method.

Table 3 and Picture 1 shows that the total number of the student who gains good score (> 80) is 27 students, but the total number of the student who gains score more than > 80 is 13 students. The comparison is 2:1. The total number of the student who gains score > 80 in the experiment group is twice of the control group. Hence, we could say that the heterogeneous group in applying the jigsaw method give a more positive impact on student learning outcomes.

Notwithstanding the fact that the output of statistical analyze is no significant differences between the homogeneous and heterogeneous group in applying the jigsaw method but when we do a deeper analysis the differences is valuable. The more analysis conducted, the more differences of the effectivity homogeneous and heterogeneous group in the jigsaw method discovered.

The actual cooperative learning method ensues when students interact cooperatively (Slavin, 1988). Cooperative interaction occurs due to the disagreement between the member of the group. Hence, the challenging discussion about a disagreement between them becomes the stimulus for more understanding between them. In the heterogeneous group the challenging discussion more possibly occurred so, this study shows that the student heterogeneous group gain more scores than students in the homogeneous group.

The group apportionments that heed the heterogeneous of the members will generate more possibility of the interaction between the group member (Allen & Kern, 2017; Graham, 2015). That occurred because of the different backgrounds of the members. The members bring out different ideas because they have different ability levels and consideration. Furthermore, the interaction between a member in the heterogeneous group also found form desire to shows the best to the other members (Looi, Lin, & Liu, 2008; Poloju et al., 2018).

The group composed of different people will produce different ideas that augment the understanding of the group members (Poloju et al., 2018). Different from the homogeneous group, the ideas from group members almost the same. People from the same background and ability level would like more agree to each other. Hence, challenging interaction between group

members won't prevail. The variety of ideas from group members facilitating students to gain an insightful understanding (Abdullah, 2017; Farhaini, 2017; Silalahi, 2019).

When the group was forming by asking the student to be in a group with their friends, they will choose their close friends. They will choose a student who fits with them. This group will lack challenging interaction. It is predictable. Because of the high feeling of loyalty, feeling the same, and on a par level of ability create a strong bonding between them. The contradiction between group members in the homogeneous group less likely to happen.

The homogeneous group offers less opportunity for the members to be in conflict. Defiance is most likely not happen in this group. The member working without challenge to equalize their ideas with another member. This situation did not stimulate the member to be more motivated to speak up their ideas (Chairunisa, 2014; Firidho, 2019; Winayawati, Waluya, & Junaedi, 2012)

The group dynamic is important in facilitating group members interacting actively. Without group dynamics, the member will learn nothing from another member. This causes the member to gain minimal new ideas and points of view (Purnamasari, Yusmansyah, & Rahmayanthi, 2015; Sukmawati, Neviyarni, Syukur, & Said, 2013; Widiantonno, 2017; Wulandari, Setyowani, & Mugiarto, 2012).

The result of this study gives us more consideration to stress the importance of facilitating positive interaction between group members in applying cooperative learning methods. Group interaction and the group dynamic is a must to encourage the student to learn together in a group. From their interaction, they will gain a meaningful understanding that useful for them. This kind of interaction will easily available in the heterogeneous group.

## Conclusion

The result of this study describes that there are no significant difference between the homogeneous and heterogeneous groups in applying the jigsaw method in an educational psychology course. Although the difference are small from the analytical view of the data details, the conclusion of this study is that heterogeneous group is more effective than the homogeneous group in applying the jigsaw method.

The recommendation to the teacher in the school to applying the jigsaw method or generally cooperative learning method in school is to pay high attention when creating a discussion group. The best way in this phase is to makes group heterogeneous by divided the student based on their gender, ability, and ethnicity. For the next research, it will be helpful to investigate the effectivity of the jigsaw method from another point of view and use this study result as the background. The deeper investigation of the jigsaw learning method will be extremely useful because the teachers in school use this method widely.

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