The Effect of Cooperative Learning on Learning Motivation:  
A Meta-Analysis

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Submitted 8 September 2020   Accepted 23 June 2023   Published 27 June 2023

Abstract. Cooperative learning can increase students’ learning motivation. Numerous studies have examined the effect of these models on students’ motivation to learn. This meta-analysis study was designed to generalize the impact on science learning motivation in elementary, junior high, and senior high school students. This study aims to examine the effect of cooperative learning models on students’ learning motivation at the elementary, junior high, and high school levels, as well as the difference in mean motivation scores between the control and experimental groups. This study was conducted using meta-analysis techniques. The data used in this study came from 13 previous studies. The data were then analyzed using descriptive and inferential statistics. The research findings revealed that the effect of the cooperative learning model on learning motivation at the junior high school level was greater than that at other educational levels. Additionally, there was no discernible difference in the mean motivation score between the experimental group using the cooperative learning model and the control group using the conventional learning model.

Keywords: cooperative learning; learning motivation; learning model; meta-analysis

Introduction

Learning, which includes reading, writing, drawing, storytelling, and other complicated activities, is one of the multifaceted processes used to acquire knowledge. According to Skinner (Feist & Feist, 2008; Hergenhahn & Olson, 2015), behaviors can be learned well. The conditions that make the behavior appear can be predicted, controlled, and conditioned. Adliyani (2015) discusses in more detail how behavior develops as a result of a variety of factors, such as the reciprocal relationship between stimulus and reaction.

Learning as a behavior means that there must be an incentive to develop learning behavior. Cooperative learning is a form of learning that can provide a stimulus for students to engage in learning behaviors. Hanafy (2017) argued that in the study, the educators do the efforts in order to create the process of acquiring knowledge, proficiency assignment, forming attitudes and trust in learners in order to facilitate the students to learn well. Cooperative learning was suggested as a learning strategy that can increase the motivation of young people (Fernández-Espinola et al., 2020). Cooperative learning is described as "one large step beyond just learning next to one another to

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learning with, by, and for each other” (Alcalá et al., 2019; Metzler, 2005). Johnson in Rachmah (2017) believes that cooperative learning method helps to acquire critical thinking skills. This can happen because the students with cooperative learning acquires critical thinking skills in which the students must explain, discuss a variety of perspectives, and have a broader understanding of the materials they learn.

Gambari et al. (2015) explains that cooperative learning allows students to be actively involved in learning, to communicate their ideas with each other, to brainstorm, provide immediate feedback, and to work together to solve problems. That statement indicates that cooperative learning can help drive students to engage in learning actively, communicate one another, exchange thoughts, re-hold feedback and have issues together.

Wedyawati and Lisa (2019) added that cooperative learning is a study focused on the use of small groups of students, working together in order to maximize the learning conditions so that they can achieve learning objectives. The steps of cooperative learning based on Ibrahim, et al. (Al-Tabany, 2017) are: (1) conveying the purpose of the lesson and motivating the students; (2) presenting the information; (3) organizing the students into cooperative groups; (4) guiding groups of work and study; (5) evaluating learning outcomes; and (6) giving rewards.

Based on Himawan et al. (2018), learning model is a plan or pattern used as a guideline for planning learning activities in the classroom. The learning model is a common pattern of learning behavior to achieve the intended competency or objectives that is made based on the belief that cooperative learning is among the learning models that can help improve student motivation.

According to Woolfolk (2009), motivation is an internal state that arouses, directs, and sustains behavior. Cleopatra (2015) stated that motivation is a factor that stimulates the occurrence of encouragement then responding and behaving. Suprihatin (2015) argues that how strong an individual’s motivation would determine the quality of the behavior appeared, whether in the learning context, working or in other context of our lives. Hancock in Tran (2019) stated that motivation is considered as an indispensable element that offers guidance, inspires, and maintains constructive attitude towards a shared goal. The intent of its statement is that motivation is an indispensable element that offers guidance, inspiration, and attitude maintenance constructively for common purposes.

According to Daud (2012), learning motivation is the overall driving force of the students who can actively participate in learning activities, ensuring the continuity of the learning activities and giving direction to learning activities in order to achieve the goal. Emda (2018) stated that motivation highly affects the success of the students’ learning outcomes. The success of learning will be achieved when there are both willingness and encouragement to learn. Razak (2016) added that motivation definitely supports in mastering the materials and in consequence, the students’ learning outcomes also increase which means that the motivation is very crucial for the students to master the material and cause increased outcome. Ahmadi in Mulyaningsih (2014) also argued that motivation can determine the quality of the goal reached. The higher the motivation, the greater the success of learning acquired. The one who has great motivation will be actively striving, persistent, not easy to yield and he/ she
will actively indulge in learning resources to increase the achievements in solving problems.

Sardiman in Dhitaningrum and Izzati (2013) explained that the aspects of learning motivation are as follows: (a) encouraging someone as a mobilizer to release energy. In this case, the motivation is the activator of every undertaken activity; (b) determining the action direction, which is the objectives direction. Thus motivation can instruct the direction and activities which need to be done in accordance with the objectives desired; and (c) selecting the deed, for instance, determining what deeds must be done that are compatible in order to achieve the objectives. The aspects of Learning Motivation based on Qudsyi et al., (2011) are as follow: (a) there is a desire, attitude, support, individual need to learn; (b) there is an ongoing state of individuals involvement to finish the task, as an activity form or attitude which is directed towards objective achievement; and (c) there are both commitment and intensity, owned by individuals to keep learning.

Dalyono (Istanti, 2015) explained that if a child has low motivation, it will cause he/she has difficulty in learning. It will certainly affect the learning success and the child’s achievement. Mawarsih et al. (2013) in their research revealed that students who have a relatively low motivation seem reluctant to go to school which caused them to have low learning achievements. The research conducted by Indriani (2016) found that a lack of motivation is one of the reasons why the students still have low learning achievements. This can be seen from the mathematical value of 6.00 which is categorized as low achievement because it is below the standard of minimum completeness criteria. Jamal (2017) argued that the learning motivation is one of the factors causing low student learning achievement, especially in Social Science (IPS) subjects. Low learning achievements can be found through the value of the midterm exam (UTS) which is largely under the standard of minimum completeness criteria (KKM) of 75.

Anggraini (2016) believed that there are two factors that make a person motivated, namely: (1) internal factors. This motivation is formed due to self-awareness of understanding about the importance of self-development and provision to live life; and (2) external factors, i.e. stimulation from other people or surrounding environment that can affect the psychology of the person concerned. Saputra et al. (2018) revealed that motivation development can influence many factors of students’ goals and aspirations, the ability of the students, physical and spiritual condition of the students, the environmental condition of the students, dynamic elements in learning, and the effort or encouragement of the teacher in motivating. In addition, Sulistyo (2016) said that one of the factors that can inspire the students’ learning motivation is the learning model used.

Several studies have been conducted related to various types of cooperative learning models. Akhsani and Jaelani (2018) in their research “Improving Students’ Learning Motivation on Graph Theory Course through Snow Ball Throwing Method” argued that Snow Ball Throwing Type Cooperative learning is one of the innovative learning models that have a significant effect on increasing the students’ learning motivation by enhancing students’ cheerfulness and passion in the learning process. Suparta et al. (2015) research findings revealed that the use of cooperative learning models ‘make a match’ technique is effective to improve students’ learning motivation in learning process. Raksun (2009) also found out that there is an increase in students’ learning motivation.
through cooperative learning type namely ‘pair checks’. Sulamis et al. (2013) revealed that the students’ motivation for learning is increased after the implementation of the Jigsaw type of cooperative learning. Raksun (2009) added that the implementation of cooperative learning can improve the students’ motivation.

Those various research findings have proved that cooperative learning can improve the motivation of the students’ learning. Although there have been many studies on the effect of cooperative learning models on students’ learning motivation, no findings have provided any conclusive generalizations regarding the models’ impact on science learning motivation in elementary, junior high, and senior high school students. Therefore, a meta-analysis study is needed. This research tried to expose the scientific average evidence of previous research that cooperative learning models affect the motivation of the students’ learning at elementary school, junior high school, and senior high school levels.

Methods

This study applied meta-analysis method. This meta-analysis is used to analyze the empirical research that has been conducted by previous researchers (Page et al., 2021; Retnawati et al., 2018). This meta-analysis examines three data sources consisting of a thesis, National and International Journal toward the influence of cooperative learning models on the students’ motivation. The following criteria were used to select articles: (1) articles published from 2015 to 2019; (2) the types of experimental research used are an experimental class and a control class; (3) the experimental class used a cooperative learning model while the control used a conventional learning model. The selection process of data source follows the following figure:

Figure 1
Data Collection Chart Based on The Pattern Prism Flow Diagram (Source: The PRISMA Group, 2009)
Having performed the Data collection chart based on the pattern of Prism Flow Diagram based on Figure 1, data is obtained from sources on the following Table 1:

<table>
<thead>
<tr>
<th>No</th>
<th>Parameter</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Thesis</td>
<td>2</td>
</tr>
<tr>
<td>2.</td>
<td>National Journal</td>
<td>9</td>
</tr>
<tr>
<td>3.</td>
<td>International Journal</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>13</td>
</tr>
</tbody>
</table>

In administering the research results that will be aggregated in meta-analysis, coding needs to be conducted (Retnawati et al., 2018). This coding is an essential requirement to facilitate the data analysis. The coding in this study contains information about the effect of the cooperative learning models on the learning motivation about the authors and the research years, the education level of the research subjects, the number of samples on the experimental and control groups, the learning motivation mean score of the experimental and control groups, and the control group standard deviation of the research subject.

The stages of this study are (1) the identification of research based on education level of research subjects; (2) identification of the sample numbers and the learning motivation mean score of experimental and control groups as well as the control group standard deviation from the research subject; (3) calculating the effect size by using Glass’ Pattern (Glass, 1981). The Effect size is calculated based on the learning motivation mean score of experimental and control group and the control group standard deviation from the research subject. This effect size calculation can be calculated based on the following formula:

$$\Delta = \frac{\bar{x}_{\text{eksperimen}} - \bar{x}_{\text{kontrol}}}{SD_{\text{kontrol}}}$$

With the effect size $\Delta$ criterion by Chen et al. (2010):

- 0.20, Small Effect
- 0.50, Moderate Effect
- 0.8, Big effect

Furthermore, to evaluate the effect size can also be based on the value of $r^2$ by Chen et al. (2010), as follows:

- $r^2 = 0.01$, Small effect
- $r^2 = 0.09$, Moderate effect
- $r^2 = 0.25$, Big effect
Results

Based on the data source analysis results of this study, it is obtained the effect size as follows:

Table 2
The Effect Size of Cooperative Learning Model towards Learning Motivation

<table>
<thead>
<tr>
<th>No</th>
<th>Writer and Year</th>
<th>Level</th>
<th>X_K</th>
<th>X_E</th>
<th>SD</th>
<th>∆</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hakim and Syofyan (2018)</td>
<td>SD</td>
<td>68.96</td>
<td>69.46</td>
<td>3.3</td>
<td>0.15</td>
<td>Small</td>
</tr>
<tr>
<td>2</td>
<td>Kesnajaya et al. (2018)</td>
<td>SD</td>
<td>139.12</td>
<td>152.4</td>
<td>8.72</td>
<td>1.52</td>
<td>Big</td>
</tr>
<tr>
<td>3</td>
<td>Isnaeni (2016)</td>
<td>SMP</td>
<td>63.16</td>
<td>75.29</td>
<td>7.13</td>
<td>1.70</td>
<td>Big</td>
</tr>
<tr>
<td>4</td>
<td>Saparwadi (2015)</td>
<td>MTsN</td>
<td>82.4</td>
<td>85.93</td>
<td>6.11</td>
<td>0.58</td>
<td>Big</td>
</tr>
<tr>
<td>5</td>
<td>K. Darmika et al. (2014)</td>
<td>SMP</td>
<td>68.69</td>
<td>74.04</td>
<td>3.91</td>
<td>1.37</td>
<td>Big</td>
</tr>
<tr>
<td>6</td>
<td>Sundari et al. (2018)</td>
<td>SMP</td>
<td>56.8</td>
<td>63.8</td>
<td>4.97</td>
<td>1.41</td>
<td>Big</td>
</tr>
<tr>
<td>7</td>
<td>Taslim (2016)</td>
<td>SMA</td>
<td>87.83</td>
<td>91.25</td>
<td>6.05</td>
<td>0.57</td>
<td>Big</td>
</tr>
<tr>
<td>8</td>
<td>Arifin and Ruwanto (2017)</td>
<td>SMA</td>
<td>57.84</td>
<td>61.07</td>
<td>6.68</td>
<td>0.48</td>
<td>Medium</td>
</tr>
<tr>
<td>9</td>
<td>Mustami and Safitri (2018)</td>
<td>SMA</td>
<td>80.41</td>
<td>89.03</td>
<td>6.42</td>
<td>1.34</td>
<td>Big</td>
</tr>
<tr>
<td>10</td>
<td>Fauzi et al. (2017)</td>
<td>SMK</td>
<td>73.22</td>
<td>78.95</td>
<td>11.08</td>
<td>0.52</td>
<td>Big</td>
</tr>
<tr>
<td>11</td>
<td>Irham et al. (2017)</td>
<td>SMA</td>
<td>92.9</td>
<td>104.16</td>
<td>10.22</td>
<td>1.10</td>
<td>Big</td>
</tr>
<tr>
<td>12</td>
<td>Budiani and Diarta (2014)</td>
<td>SMA</td>
<td>224.9</td>
<td>251.1</td>
<td>14.1</td>
<td>1.86</td>
<td>Big</td>
</tr>
<tr>
<td>13</td>
<td>Ambarwati et al. (2017)</td>
<td>SMA</td>
<td>66.18</td>
<td>75.59</td>
<td>6.79</td>
<td>1.39</td>
<td>Big</td>
</tr>
</tbody>
</table>

The Mean Score 89.42 97.85

Note: X_K: The mean scores of the control group learning motivation, X_E: The mean scores of the experimental group learning motivation

Table 2 shows that the mean score of the experimental group learning motivation is 97.85 which is greater than the mean score of the control group learning motivation of 89.42, which means that cooperative learning treatment can increase the students’ learning motivation. This study found the effect size difference on the cooperative learning model toward the learning motivation on each education level. The results can be seen on the following table:

Table 3
The Effect Size Mean scores of Cooperative Learning Model on the learning motivation based on the education level

<table>
<thead>
<tr>
<th>No</th>
<th>Level</th>
<th>Mean Score</th>
<th>SD (EZ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elementary School</td>
<td>0.84</td>
<td>0.97</td>
</tr>
<tr>
<td>2</td>
<td>Junior High School</td>
<td>1.2fa6</td>
<td>0.48</td>
</tr>
<tr>
<td>3</td>
<td>Senior High School</td>
<td>1.04</td>
<td>0.53</td>
</tr>
</tbody>
</table>

Based on Table 3, it is revealed that the mean score of the Effect Sizes in the Elementary, junior and high school levels are in the big effect category.
Based on the education level in Figure 1, it is known that cooperative learning model has big effect on junior high school students’ learning motivation. It is inferred that the implementation of cooperative learning models in junior high school students has a great effect, especially in improving the students’ learning motivation so that cooperative learning is very suitable to be implemented in junior high school students. The normality test results on the Table 4 shows that the significant value \((p)\) on the Kolmogorov-smirnov test and the Shapiro-wilk test are 0.001 \((p < 0.05)\). The results reveal that the data are not in the normal distribution.

**Table 4**

<table>
<thead>
<tr>
<th>Group</th>
<th>Kolmogorov-Smirnov(^a)</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average motivation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>.316</td>
<td>.667</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>.320</td>
<td>.654</td>
</tr>
</tbody>
</table>

Since the data of this meta-analysis study are not in the normal distribution, the hypothesis tests are performed using non-parametric statistical methods and applied the Mann Whitney test, as seen on the following Table 5:
Table 5
Test Result of Mann Whitney

<table>
<thead>
<tr>
<th></th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>65.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>156.000</td>
</tr>
<tr>
<td>Z</td>
<td>-1.000</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.317</td>
</tr>
<tr>
<td>Exact Sig. [2*(1-tailed Sig.)]</td>
<td>.336</td>
</tr>
</tbody>
</table>

The basis of the decision on the Mann Whitney test using SPSS software which are shown: (1) If the value of ASYMP. Sig. (2-tailed) smaller than probability 0.05 then H0 rejected; (2) If the value of ASYMP. Sig. (2-tailed) is greater than probability 0.05 then H0 is acceptable. Based on Table 5, it is revealed that the value of ASYMP. Sig. (2-tailed) as many as 0.317 is greater than the probability value of 0.05. Thus, there is no significant difference between the motivation mean scores of control group and experimental Group.

Discussion

The increasing of the students’ learning motivation by using cooperative learning is also demonstrated by Susilo (2013) in his research where it was revealed that students’ learning motivation increased after participating in a cooperative learning model of numbered head together type. Sulfemi (2019) showed that the use of Mind Mapping’s cooperative learning model could increase the students’ learning. Mustami and Safitri (2018) added that the students who learned using the NHT-ARIAS learning strategy are more motivated compared to those learned using the direct ARIAS learning strategy.

It means that the students’ learning outcomes, by using cooperative learning model of NHT-ARIAS, are more motivated than ARIAS learning model. It is due to the cooperative approach of NHT type that provides many opportunities for students to be more active in the learning and teaching process. Sulistyo (2016) research findings showed that the implementation of cooperative learning model of ‘Teams Games Tournament’ type can increase the students’ learning motivation. Ahmad (2016) showed that the use of cooperative learning “pair checks” type can improve the students’ learning outcomes. Laila et al. (2017) revealed that the application of cooperative learning of “group investigation” type can increase the students’ learning motivation.

Cooperative learning is able to increase the students learning motivation. When the students are motivated to learn, it will give an effect on the students’ cognitive learning outcomes. Piaget believed that a person’s cognitive development occurs in four phases, namely, sensory-motor, pre-operation, concrete operation and formal operation (Suparno, 2001). Piaget asserted that learning will be more successful when it is adjusted to the level of the students’ cognitive development. The students should be given the opportunity to do experiment with physical objects, which are supported by the interaction with peers and assisted by the teacher’s questions predication. The teachers should provide a lot of stimulation to the students to actively interact with the environment, search for and find things
from the environment (Widyati, 2014). Asih (2018) stated that the stage of the students’ cognitive development in the middle school by Piaget theory is called as the formal stage. At this stage, they develop new tools to manipulate information, can think abstractly, deductively and inductively that can consider the possibilities of the future, seek answers, handle problems flexibly, test hypotheses, and draw conclusions.

Cooperative learning is very suitable for the students because cooperative learning is a learning model that invites students to work together (Nurnawati et al., 2012). Trianto (2007) believed that cooperative learning arises from the concept that students will find it easier to understand the difficult concept if they discuss it with each other. Students routinely work in groups to help each other to solve problems. Ismawati and Hindarto (2011) stated that cooperative learning will encourage students to solve the difficult concepts and discuss those problems with their peers. Suherman in (Rini & Amin, 2013) added that the language of peers is easier to understand, due to the fact that there is no sense of reticent, inferiority, embarrassment in which they are expected to ask difficult problems.

Another research conducted by Sanz, Fernández-Espínola et al. (2020) who revealed that cooperative learning can increase the type of intrinsic and regulation motivation in junior high school students. In addition, motivation in cooperative learning can be increased through two things, namely teachers must carry out creative learning with the help of teaching materials (Hidayati et al., 2018), and provide praise or appropriate punishment (Darmawan, 2018). Hamzah and Nasri (2020) in the results of his research explained that cooperative learning can increase students’ learning motivation and is able to change their perception of learning in a positive direction. The students’ perception after experiencing cooperative learning in a long period of time reflects four positive ideas, namely: cooperation, linkage, enjoyment, and novelty.

A different argument is explained by Alghamdy (2019) that stated that it is possible that in cooperative learning, the division of groups is based on the level of student achievement in the class which is likely to create feelings of displeasure in some students, among them is the dependence of low-achieving students on high-achieving students. This is not in accordance with the characteristics of cooperative learning, as Ghaith (2018) explained that cooperative learning is based on teamwork. It require students to need each other positively to the extent that each student in the group feels responsible for his own task, and even cares about the tasks of friends in the group to determine the success of himself and his group.

Putri (2018) found on her research that peer-to-peer acceptance is an important part that directly affects the students’ learning motivation. Rahman (2014) suggested that parents’ support and learning facilities in schools have an effect on learning motivation toward the students in junior high school. Sujiantari et al. (2016) also argued that reward and punishment have a significant influence on the learning motivation in junior high school. Widoyoko and Rinawat (2012) added that teacher mastery of the instructional materials and various learning strategies in accordance with the characteristics of learning materials and characteristics of students are able to foster the students’ learning motivation in junior high school.

Even though in testing the hypothesis using Mann Whitney, it shows there is no significant
difference between the motivation’s mean scores between the control and the experimental group, every learning model has its own advantages and disadvantages on its implementation.

The advantages of cooperative learning model based on Rosita and Leonard (2015) are: (1) the students are able to formulate and ask questions about the material being taught because they indirectly acquire an example of questions posed by educators, and they have the opportunity to think about the materials being taught; (2) the students will be trained to apply the concept of exchanging opinions and thoughts with their friends in solving problems; (3) the students are more active in learning because of completing their duties in groups, in which each group only consists of two people; (4) the students have the opportunity to present their discussion with all students to spread their idea; and (5) the teachers are able to monitor the learners frequently in the learning process. According to Slavin (Pakarya, 2008), the weaknesses of cooperative learning is that the role of group members who are clever becoming more dominant. In addition to that, cooperative learning take a relatively longer time compared to conventional learning; it can even cause learning materials to develop to the point that it can not be adjusted to the existing curriculum if the teacher is not experienced. In teaching skills terms, teachers need to prepare and have a long experience in order to implement the cooperative learning well.

Conclusion

Based on the research findings, the meta-analysis of previous research data that cooperative learning models affect student learning motivation at three school levels concludes that students in junior high school was greater than at other educational levels. It also reveals that there is no significant difference between the mean motivation score of the control group using conventional learning models and the experimental group using cooperative learning models. Further research is still needed with more comprehensive data.

Recommendation

It is advised that comparable study be done in the future with a larger sample size or that research be done similarly but with a different focus, such as learning outcomes, digital learning, and 21st century skills (basic literacy, competency, and character qualities). In addition, a variety of learning models, not merely cooperative learning models, have been established in Indonesia to encourage 21st century abilities.

Declarations

Acknowledgement

We thank the leadership of the Faculty of Tarbiyah and Keguruan UIN Alauddin Makassar for funding this manuscript writing process. In addition, thank you to the researchers who have provided data as a source of data in this study. We thank the leadership of the Faculty of Tarbiyah and Keguruan
Funding

The author received no funding support in preparing and publishing this article.

Conflict of Interest

The researchers stated that there was no conflict of interest in this research.

Author’s Contribution

ED: Responsible for ideas, data interpretation, discussions, and article manuscript drafts FN: Processing, analyzing, and talking about data SA: Gathering and discussing data AUT: Gathering and discussing data

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