



Improving Social Science Learning Outcomes Using Guided Teaching Model In Indonesian Context

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ABSTRACT

Purpose: This research aims at investigating the increase in teaching and learning activities by using guided teaching model and what effect it makes on the achievement on learning outcomes. Guided teaching facilitates teaching and decision-making abilities of the students. **Research Methodology:** The study was carried out on a sample of 290 students of class IX of the schools in Indonesia by using guided teaching model. This study has followed the questionnaires method to collect data and smart-PLS to examine the data.

Findings: The findings reveal that the teaching and learning activities show a positive association with learning outcomes of the students. The Guided learning model also significantly mediates among the nexus of teaching activities, learning activities and learning outcomes of the students. **Implication for Research and Practice:** The study recommends that teachers in schools should make use of appropriate learning models according to the material to be taught, because the use of the right learning model can improve student learning outcomes.

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Introduction

A major objective of education sector is to create such human capital that aims to improve the quality of life. In addition, such human resources are resourceful and have a vast knowledge. This is very much necessary to master and develop science and technology (Lu, Huang, Huang, & Yang, 2017). If education is planned out consciously, students can actively develop their potential through a learning process made available to them at all levels and in every type of education. This phenomenon was also supported by the educational objectives stated in the Republic of Indonesia Law No. 20 of 2003. The Ministry of National Education is the institution responsible for the implementation of education reforms in the education system (Malmia et al., 2019). These reforms include improving the curriculum, improving facilities and infrastructure, and increasing the quality of teaching staff (Salas-Pilco, 2020).

To achieve this goal, a teacher is required to undergo several learning experiences. The role of the teacher is a major factor in supporting the success of students in the teaching and learning process. One of the important components that determine the success of students in the teaching and learning process is the use of teaching aids (Amriyanto, Warsono, & Prasetyo, 2018). Learning to use teaching aids is quite effective and economical for defining students' learning interests and activities, as well as providing clear understanding to them. Teaching is not only transferring knowledge to students, but it also involves collaboration between teachers and students, and between students (Suwarno, 2021). This collaboration covers three aspects namely cognitive, affective, and psychomotor aspects. The output of human capital in an education system is the culmination of all these three aspects (Erwanto, Maryatmi, & Budiyanto, 2018).

One of the subjects taught in elementary schools in Indonesia is Social Sciences (IPS), which has become a necessity and recognition of the Indonesian nationality. It is the subject that trains students to become good citizens and interact dynamically on various forums (Aidinopoulou & Sampson, 2017). It is the backbone of national education system as it also builds citizens who are democratic and responsible. Social Sciences (IPS) lessons play a strategic and important role in shaping students' attitudes and daily behavior, so that they become good citizens (Raharjo, Khairudin, & Abd Baser, 2018). The importance of education sector in Indonesia is increasing and due to this importance, the government also increases their expenditure on the education sector with time. The Figure 1 has been shown the increasing trend in the government expenditure with time.

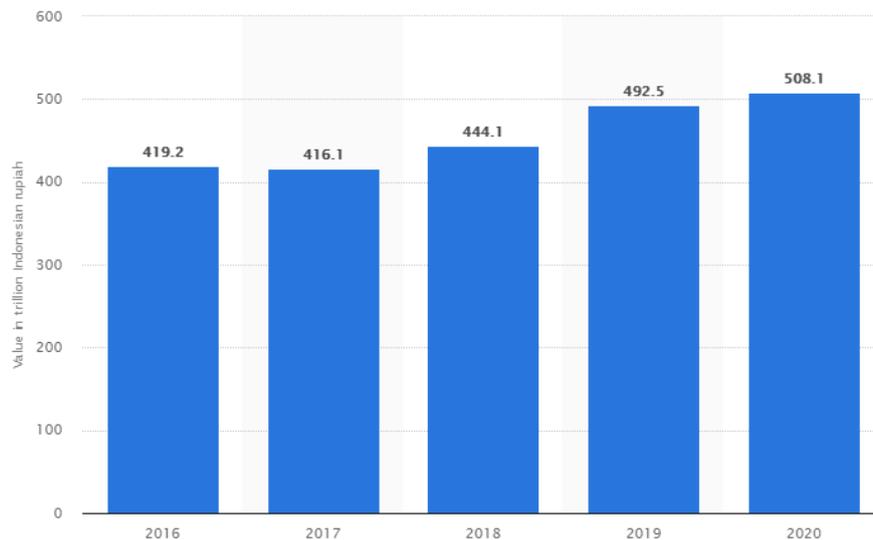


Figure 1: Education expenditures of Indonesian government

The current scenario as witnessed prior to making this study in class IX is rather disheartening. It was observed that while teaching the topic 'Surrounding Environment' as a part of the social sciences curriculum, students were either less enthusiastic in participating in the learning process or were rather too busy in other activities that caused major distraction (Sari, Sitorus, Situmorang, & Sudrajat, 2020). It is hence utmost necessary to pay special attention to such a behavior so that students are motivated to learn such important subjects. Specifically, in the field of social sciences, students' motivation and interest in learning is a big prerequisite for the success of the learning process (Saputra, 2018). In addition, such a motivation and interest in students is an important factor in carrying out practical activities like of business and one's career (Mulyono, Asmawi, & Nuriah, 2018).

Problem Statement

Despite all efforts at the national levels, the teaching of the subject of social studies faces many obstacles. A few constraints include students' not paying attention to what is conveyed by the teacher, being less enthusiastic in participating in learning activities or not giving any response to questions asked by the teacher (Iqbal, 2021). During the learning process, it has been observed that students are busy chatting with friends or scribbling in books or go in and out of the class to restrooms thus distracting themselves from the learning process. Often the class becomes very quiet, students feel sleepy and bored because they only listen to and write what the teacher instructs. The learning carried out by the teacher is still not optimal.

These conclusions are drawn from the learning outcomes of students in the course "Surrounding Environment". The Minimum Completeness Criteria (KKM) was 60, but

out of 27 students, only 8 students (29.62%) could get a score above 60; 19 of them (70.38%) got a score below the KKM. This shows that the learning outcomes of students, especially in the subject of surrounding environment, are still below the minimum completeness criteria (KKM). Such a scenario will have long term effects (Sugio, 2019).

Social studies learning should be ideally taught in accordance with the thinking level of students. The method used should be so systematic and organized in nature that it motivates students to participate actively in social studies learning and finds it easy and full of fun (Kong, Chen, Huang, & Luo, 2017). One of the most effective methods to accomplish this change is the use of appropriate learning models that would create a pleasant learning environment and attract students' interest in learning. In this study, the researcher aimed to offers an interesting, easy and simple learning model, namely the Guided teaching learning model (Saihu, 2020). Guided Teaching is a type of learning that begins with several questions given by the teacher to students. The teacher ensures that these questions have several possible answers (Platt, 2020). This type of model aims to determine the level of understanding or decision-making ability of students. After receiving answers from students, the teacher draws conclusions and divides students in categories for next steps of learning (Bevilacqua et al., 2019). This Guided learning model has proven to be a useful learning intervention to be used as the basis for designing a learning schedule. This study makes a deeper understanding of this model (Farashahi & Tajeddin, 2018).

Literature Review

Learning is essentially a human activity to make behavioral changes in individuals; it is a characteristic that distinguishes humans from other creatures. It helps to develop various competencies, skills and attitudes. Learning starts from birth till the end of life. In simple terms learning is an attempt to gain intelligence or knowledge, to change behavior or respond to some experience. Sabatinie, Susilaningsih, and Kurniawan (2019) states that "Learning outcomes are the result of an interaction of learning and teaching actions". Learning and teaching are inseparable concepts. Learning refers to how a student should behave or react as a subject while teaching refers to how a teacher should perform as a teacher. It is always expected that there would be the learning outcomes in accordance with the specific instructional goals set before the learning process. Therefore, tests are conducted periodically to assess the learning outcomes achieved.

According to Sahabuddin (2017) the "Learning outcomes are defined as the level of student success in learning subject matter at school which is expressed in scores obtained from the test results to recognize a number of certain subject matter". This leads to the conclusion that learning outcomes do not merely depend on teaching and learning process, but are characterized by changes in behavior, knowledge, skills and abilities of the learners after receiving and carrying out the learning activities. Learning is thus linked with changes in attitudes and life patterns, with new perspectives and abilities. Such changes in behavior occur in knowledge (cognitive), skills (psychomotor), and values and attitudes (affective). Such changes are not temporary but are permanent and can be nurtured and stored. However, these changes do not just happen but must be accomplished with a great effort and by interacting with the

environment. In this process, the interaction takes place within the teaching and learning process. Each subject has the expected goals or expects the results (changes) to be achieved in accordance with what has been designed.

A study by Cho, Park, and Lee (2021) too, asserts that learning outcomes achieved by students are the results of interactions between various influencing factors, both internal and external. Internal factors come from within students and affect their learning ability. These internal factors include intelligence, interest and attention, learning motivation, persistence, attitudes, study habits, and physical and health conditions. External factors come from outside of students and affect learning outcomes. These external factors include family, school, and society. Family conditions particularly affect student learning outcomes such as family's messy economic situation, husband and wife quarrels, lack of parental attention to children, and poor behavior of parents in everyday life (Artiningsih, Riyanto, & Harmanto, 2019). Thus, based on above studies, the present study has developed the following hypotheses.

H1: Teaching activities have positive linkage with learning outcomes of the students.

The Social sciences domain is a combination of various scientific disciplines, such as economics, history, geography, and sociology. All these disciplines are arranged systematically and integrated which then becomes a major discipline that cannot be broken down because of the integration of many sciences. Olubela and Adebanjo (2020) states the "Social Sciences (IPS) is an integration of various branches. It includes sociology, history, geography, economics, politics, law and culture. It is formulated on the basis of social realities and phenomena in society which are manifested in an interdisciplinary approach from these aspects and branches of social sciences". Hartikainen, Rintala, Pylväs, and Nokelainen (2019) observes that the essence of social studies is the hope of fostering a good society where the members truly grow into rational social beings, full of responsibility and social values. Based on these opinions, it can be concluded that Social Science (IPS) is a combination of various social science disciplines that contribute to making good citizens. It emphasizes more on the relationship between individuals and society, and how both should interact in the physical environment.

One of the objectives of learning Social Sciences (IPS) is to help students become good citizens and be able to make decisions rationally. The study of Social Sciences provides them the required knowledge and information that help them to resolve social problems whose results are not only beneficial for individuals and families, but also for the entire society as well as the nation. Gross Darmisal and Nurdin (2020) considers social studies education as preparing students to become good citizens. Another goal of social studies education is to develop students' ability to use reasoning in making decisions to resolve problems they face in life.

Teaching models are designed for specific purposes. These models are equipped with teaching information concepts, ways of thinking, study of social values, and so on requiring students to be actively involved in certain cognitive and social tasks. Some models are cantered on teacher delivery while others try to focus on student responses in doing assignments and on students' positions as partners in the learning process. However, one thing is common in all models: each model emphasizes how to

help students construct knowledge, which includes learning from sources that are often considered passive, such as learning from lectures, films, reading assignments, and so on (Fini, Awadallah, Parast, & Abu-Lebdeh, 2018). One such model is Guided Teaching model which facilitates both the teaching and learning processes. Thus, based on above studies, the present study has developed the following hypotheses.

H2: Learning activities have positive linkage with learning outcomes of the students.

In the Guided teaching model, the teacher assigns such questions to students that have several possible answers. The objective is to ascertain the thoughts and abilities that students have. The teacher provides a few minutes to answer questions. After all answers are given, the teacher divides students into small groups (categories) based on their answers. Each group is then required to convey their answers by writing them on the board. This helps the students also to categorize their learning from a lesson. The students are guided automatically to react to the study material according to their group behavior and thus make it an interactive lecture. In the end, the teacher can ask students to compare their answers with the points that the teacher conveyed in the lessons.

According to the Dengel and Mägdefrau (2018) "Guided Teaching is a change from the direct lecture method and makes it possible to learn what students already know and understand. It helps in making learning points by means of group learning". Furthermore, Gatti, Ulrich, and Seele (2019) also opines that "Guided Teaching is a type of cooperative learning the objectives of which include increasing students' learning motivation, increasing student achievement, fostering mutual respect and cooperation, fostering an attitude of responsibility and solving problems in a better way". Guided Teaching is a strategy to ask students one or two questions to determine the level of understanding of students or to obtain conclusions and then dividing them into categories.

Acar-Ciftci (2020) also suggests a few steps for "Guided Teaching" learning:

1. Ask students a few questions to find out what abilities they have. Such questions must have several possible answers.
2. Give students a few minutes to answer questions. Encourage them to work together or in small groups.
3. Ask students to convey their answers to the teacher and note the answers they convey. If possible, they can write answers on the board by grouping their answers into categories as per the learning activities.
4. Deliver the main points of the learning material by means of an interactive lecture.
5. Ask students now whether they can compare their answers with the points that the teacher conveyed in the interactive lecture and points that can expand their arguments.

The advantages of using the Guided Teaching method are:

1. It creates an active learning atmosphere.
2. It increases motivation and enthusiasm for learning among students.
3. The learning material delivered by the teacher attracts the attention of students.

The weaknesses of the Guided Teaching method are:

1. It needs teacher's guidance to carry out learning activities.
2. The available time needs to be used properly to make the optimum use of the time.
3. The teacher needs careful and adequate preparation of teaching materials and tools.

Thus, based on above studies, the present study has developed the following hypotheses.

H3: Guided teaching method significantly mediates among the nexus of teaching activities and learning outcomes of the students.

H4: Guided teaching method significantly mediates among the nexus of learning activities and learning outcomes of the students.

Methodology

The aim of the present article is to examine the impact of teaching activities and learning activities on the learning outcomes of the students and goals also include the investigation of mediating role of guided teaching model among the nexus of teaching activities, learning activities and learning outcomes of the students. This research study has followed the primary data collection methods and employed the questionnaires for data collection. The study has selected the students of class IX of the schools in Indonesia through purposive sampling and sent the questionnaires by personal visit. To collect the data, the sample of the study comprised 290 students: 190 females and 100 males. The object of research was learning outcomes.

The smart-PLS has been employed by the researches to analyze the nexus among the understudy variables because the large sample size and complex framework (Hair Jr, Babin, & Krey, 2017). This study has taken two independent variables such as teaching activities (TA) with five items and learning activities (LA) with four items. In addition, guided teaching model (GTM) has been used as the mediating variable with four items and learning outcomes (LO) has been used as the dependent variable with six items. These variables are shown in Figure 2.

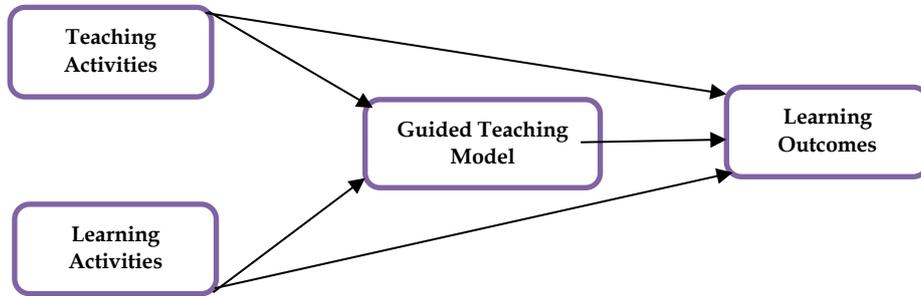


Figure 2: Theoretical model

1. Results

This study has evaluated the items correlation that is the part of measurement assessment model. The statistics have been mentioned that Alpha and CR values are bigger than 0.70 and AVE and factor loadings values are not lower than 0.50. These values have been indicated that high correlation between items. These values are mentioned in Table 1.

Table 1

Convergent validity

| Constructs | Items | Loadings | Alpha | CR | AVE |
|-----------------------|-------|----------|-------|-------|-------|
| Guided teaching model | GTM1 | 0.874 | 0.909 | 0.936 | 0.785 |
| | GTM2 | 0.880 | | | |
| | GTM3 | 0.888 | | | |
| | GTM4 | 0.902 | | | |
| Learning Activities | LA1 | 0.954 | 0.966 | 0.975 | 0.908 |
| | LA2 | 0.948 | | | |
| | LA3 | 0.956 | | | |
| | LA4 | 0.955 | | | |
| Learning Outcomes | LO1 | 0.808 | 0.889 | 0.918 | 0.692 |
| | LO2 | 0.817 | | | |
| | LO4 | 0.854 | | | |
| | LO5 | 0.817 | | | |
| | LO6 | 0.863 | | | |
| Teaching Activities | TA1 | 0.826 | 0.928 | 0.946 | 0.779 |
| | TA2 | 0.923 | | | |
| | TA3 | 0.922 | | | |
| | TA4 | 0.876 | | | |
| | TA5 | 0.861 | | | |

This study has also evaluated the variables correlation and statistics have been mentioned that Heterotrait Monotrait (HTMT) ratios are not bigger than 0.85. These values have been indicated that not high correlation between variables. These values are mentioned in Table 2.

Table 2

Discriminant validity

| | GTM | LA | LO | TA |
|-----|-------|-------|-------|----|
| GTM | | | | |
| LA | 0.411 | | | |
| LO | 0.411 | 0.436 | | |
| TA | 0.421 | 0.503 | 0.554 | |

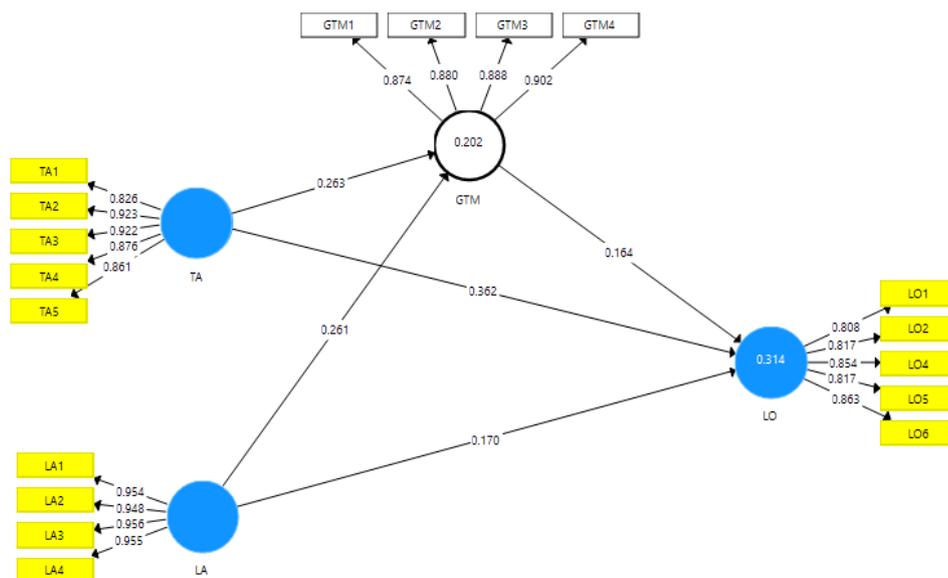


Figure 3: Measurement model assessment

The results of the structural assessment model have been shown that teaching and learning activities have positive and significant nexus with the learning outcomes of the students and accept H1 and H2. In addition, the findings also revealed that the guided teaching model significantly mediates among the nexus of teaching activities, learning activities and learning outcomes of the students and accept H3 and H4. These relations are mentioned in Table 3.

Table 3

Path Analysis

| Relationships | Beta | S.D. | T Statistics | P Values | L.L. | U.L. |
|-----------------|-------|-------|--------------|----------|-------|-------|
| GTM -> LO | 0.164 | 0.064 | 2.563 | 0.006 | 0.046 | 0.259 |
| LA -> GTM | 0.261 | 0.071 | 3.694 | 0.000 | 0.133 | 0.373 |
| LA -> LO | 0.170 | 0.067 | 2.549 | 0.006 | 0.058 | 0.282 |
| TA -> GTM | 0.263 | 0.073 | 3.613 | 0.000 | 0.133 | 0.367 |
| TA -> LO | 0.362 | 0.064 | 5.678 | 0.000 | 0.258 | 0.477 |
| LA -> GTM -> LO | 0.043 | 0.019 | 2.237 | 0.014 | 0.011 | 0.068 |
| TA -> GTM -> LO | 0.043 | 0.019 | 2.224 | 0.014 | 0.012 | 0.076 |

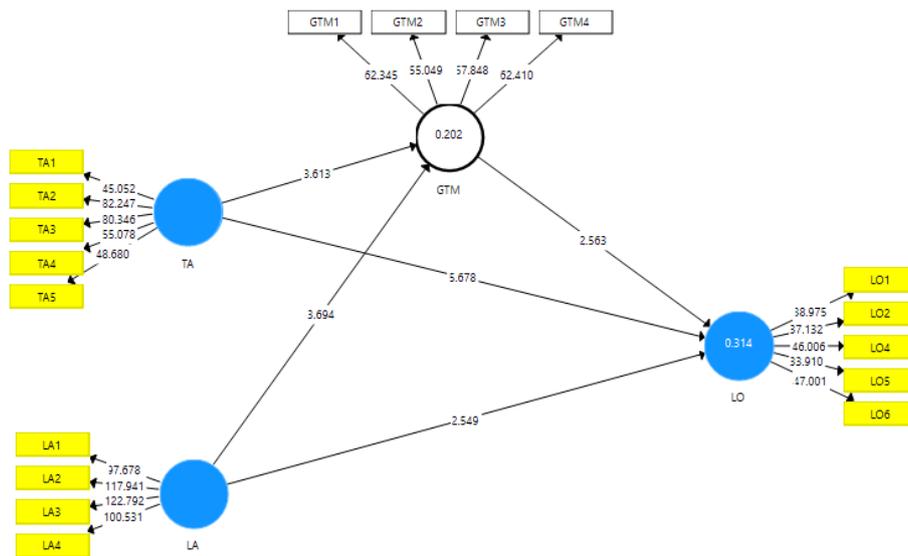


Figure 4: Structural model assessment

Discussions Conclusion and Recommendation

The results of the present study have indicated that the teaching activities has positive nexus with the learning outcomes. These outcomes are matched with the study of Boulton, Kent, and Williams (2018) who also examined that the effective teaching activities have positively influence the learning outcomes of the students. In addition, the results also revealed that the learning activities have also positive association with learning outcomes of the students. These findings are also similar to the study results of Fayanto, Musria, Erniwati, Sukariasih, and Hunaidah (2019) who also investigated that the effective learning activities of the students could also improve the learning outcomes. Moreover, the outcomes of the current research also exposed that the guided teaching model significantly mediates among the nexus of teaching activities and learning outcomes. This results are in line with the research outcomes of Margallo, Dominguez-Ramos, and Aldaco (2019) who also indicated that the guided teaching models improve the impact of teaching activities on the learning outcomes.

Additionally, the findings also elaborated that the guided teaching model significantly mediates among the nexus of learning activities and learning outcomes. This results are matched with the research outcomes of Rusmono, Winarsih, and Hardiansyah (2019) who also investigated that the guided teaching models improve the impact of learning activities on the learning outcomes. Planning in this stage the researcher explained what, why, when, where, and how the action was taken. Implementation which is the implementation or content of the design implementation. Observation (observation) of activities carried out by observers, namely regarding class action., Reflection is an activity to restate what has been done, this reflection activity is very appropriate to do when the implementing teacher has finished taking action (Wekerle, Daumiller, & Kollar, 2020). The researcher conducted a pre-action to determine the results of activities and the results of early learning of students before loading the learning model during the implementation of the learning process. The researcher provided the learning material about the topic 'surrounding environment' and invited several students to speak about the surrounding environment and then conducted a test. In this second cycle, however, the researcher only said a little about the topic 'surrounding environment'. While students were learning in accordance with the Guided Teaching method, the researcher was only supervising them and guiding the weaker students who did not understand. Thus, the results of the current article also exposed that the guided teaching model improve the relations of the teaching and learning activities on the learning outcomes and this could be similar to the outcomes of Palupi and Subiyantoro (2020) who also examined and found that the teaching effective guidance could improve the teaching activities impact on the learning outcomes of the students because it enhance the teaching ability of the teachers along with the learning ability of the students.

Conclusion and Policy Implications

Based on this study and its findings, several conclusions can be drawn. First, it is evident that by using the Guided Teaching model, it is easy to achieve the desired learning outcomes in the subject of social studies. This model was suggested keeping

in mind that students were less enthusiastic in participating in learning activities and were seen engaged in chats and other activities during the learning process. The findings show that it is necessary to adopt an appropriate learning model so that students can be motivated to participate in learning activities. Second, it was found that there was an increase in learning outcomes after implementing the Guided Teaching model. This can be seen from the data on student learning outcomes. This study makes a few suggestions. The Principals of schools should ensure that teachers use the Inside Outside Circle model during the learning process in order to increase students' activeness and their learning outcomes. The teachers are also expected to choose the right learning model according to the material to be taught, because the use of the right learning model can improve student learning outcomes. This study has guided to the regulators that they should increase their focus on the guided teaching model that should improve the learning outcomes of the students. The regulators should formulate the effective policies that enhance the use of guided teaching model in the education institutions that has ability to improve the student and teacher's ability to enhance the learning outcomes.

Limitations and Future Directions

This study has few limitations that could help the future researchers while investigating this area in future. This study has taken only two predictors such as teaching activities and learning activities and ignore the other essential elements that could affect the learning outcomes of the student. Thus, the present study recommended to the further studies that they should add more factors that have significant effects on the student learning outcomes. In addition, the present study also taken ole mediation in the analysis and ignore the moderating role in the framework and suggested that future studies should add moderating role among the predictors and predictive variables. Finally, this study has investigated only the Indonesia education institutions and ignore the cross-country analysis and suggested that the future studies should incorporate this aspect in the studies.

References

- Acar-Ciftci, Y. (2020). Bridging Knowledge and Action in the Workplace: An Evaluation on Internship Learning Outcomes of Child Development Associate Degree Program Students. *Journal of Education and Learning*, 9(3), 174-186.
- Aidinopoulou, V., & Sampson, D. G. (2017). An action research study from implementing the flipped classroom model in primary school history teaching and learning. *Journal of Educational Technology & Society*, 20(1), 237-247.
- Amriyanto, D. A., Warsono, W., & Prasetyo, K. (2018). *Application of Know Want Learning How" KWLH" Techniques to Improve Activities and Learning Outcomes of the Social Subject*. Paper presented at the 2nd International Conference on Education Innovation (ICEI 2018).
- Artiningsih, A., Riyanto, Y., & Harmanto, H. (2019). Influence of Learning Model Type Cooperative Scramble with Picture Media on Motivation and Student's

Learning Outcomes of IPS Class 2 SDN 2 Tropodo. *International Journal for Educational and Vocational Studies*, 1(2), 81-85.

- Bevilacqua, D., Davidesco, I., Wan, L., Chaloner, K., Rowland, J., Ding, M., . . . Dikker, S. (2019). Brain-to-brain synchrony and learning outcomes vary by student-teacher dynamics: Evidence from a real-world classroom electroencephalography study. *Journal of cognitive neuroscience*, 31(3), 401-411.
- Boulton, C. A., Kent, C., & Williams, H. T. (2018). Virtual learning environment engagement and learning outcomes at a 'bricks-and-mortar' university. *Computers & Education*, 126, 129-142. doi: <https://doi.org/10.1016/j.compedu.2018.06.031>
- Cho, M.-H., Park, S. W., & Lee, S.-e. (2021). Student characteristics and learning and teaching factors predicting affective and motivational outcomes in flipped college classrooms. *Studies in Higher Education*, 46(3), 509-522. doi: <https://doi.org/10.1080/03075079.2019.1643303>
- Darmisal, D., & Nurdin, B. (2020). The Relationship Between Teacher Teaching Variations and the Learning Environment With Student Learning Outcomes at Smpn 16 Padang. *International Journal of Educational Dynamics*, 3(1), 63-70.
- Dengel, A., & Mägdefrau, J. (2018). *Immersive learning explored: subjective and objective factors influencing learning outcomes in immersive educational virtual environments*. Paper presented at the 2018 IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE).
- Erwanto, E., Maryatmi, A. S., & Budiyanto, A. (2018). The Effects of Reciprocal Teaching Learning Strategy and Self efficacy on Learning Outcomes of Early Childhood (AUD) Mathematical Logic. *Al-Jabar: Jurnal Pendidikan Matematika*, 9(1), 41-50.
- Farashahi, M., & Tajeddin, M. (2018). Effectiveness of teaching methods in business education: A comparison study on the learning outcomes of lectures, case studies and simulations. *The international journal of Management Education*, 16(1), 131-142. doi: <https://doi.org/10.1016/j.ijme.2018.01.003>
- Fayanto, S., Musria, M., Erniwati, E., Sukariasih, L., & Hunaidah, H. (2019). Implementation of quantum teaching model on improving physics learning outcomes in the cognitive domain at junior high school. *IJIS Edu: Indonesian Journal of Integrated Science Education*, 1(2), 131-138.
- Fini, E. H., Awadallah, F., Parast, M. M., & Abu-Lebdeh, T. (2018). The impact of project-based learning on improving student learning outcomes of sustainability concepts in transportation engineering courses. *European Journal*

of *Engineering Education*, 43(3), 473-488. doi: <https://doi.org/10.1080/03043797.2017.1393045>

Gatti, L., Ulrich, M., & Seele, P. (2019). Education for sustainable development through business simulation games: An exploratory study of sustainability gamification and its effects on students' learning outcomes. *Journal of cleaner production*, 207, 667-678. doi: <https://doi.org/10.1016/j.jclepro.2018.09.130>

Hair Jr, J. F., Babin, B. J., & Krey, N. (2017). Covariance-based structural equation modeling in the Journal of Advertising: Review and recommendations. *Journal of Advertising*, 46(1), 163-177. doi: <https://doi.org/10.1080/00913367.2017.1281777>

Hartikainen, S., Rintala, H., Pylväs, L., & Nokelainen, P. (2019). The concept of active learning and the measurement of learning outcomes: A review of research in engineering higher education. *Education Sciences*, 9(4), 276-291.

Iqbal, M. (2021). *Use of Simple Development Tools Media and Discovery Learning Models to Improve Learning Activities and Outcomes Circular Materials for Students' Human Blood Class V SDN 04 Kotabumi Udik Lampung*. Paper presented at the Proceeding The First International Conference on Government Education Management and Tourism.

Kong, X. T., Chen, G. W., Huang, G. Q., & Luo, H. (2017). Ubiquitous auction learning system with TELD (Teaching by Examples and Learning by Doing) approach: A quasi-experimental study. *Computers & Education*, 111, 144-157. doi: <https://doi.org/10.1016/j.compedu.2017.04.009>

Lu, O. H., Huang, J. C., Huang, A. Y., & Yang, S. J. (2017). Applying learning analytics for improving students engagement and learning outcomes in an MOOCs enabled collaborative programming course. *Interactive Learning Environments*, 25(2), 220-234. doi: <https://doi.org/10.1080/10494820.2016.1278391>

Malmia, W., Makatita, S. H., Lisaholit, S., Azwan, A., Magfirah, I., Tinggapi, H., & Umanailo, M. (2019). Problem-based learning as an effort to improve student learning outcomes. *Int. J. Sci. Technol. Res*, 8(9), 1140-1143.

Margallo, M., Dominguez-Ramos, R., & Aldaco, A. (2019). Incorporating life cycle assessment and ecodesign tools for green chemical engineering: A case study of competences and learning outcomes assessment. *Education for Chemical Engineers*, 26, 89-96. doi: <https://doi.org/10.1016/j.ece.2018.08.002>

Mulyono, D., Asmawi, M., & Nuriah, T. (2018). The effect of reciprocal teaching, student facilitator and explaining and learning independence on mathematical learning results by controlling the initial ability of students. *International Electronic Journal of Mathematics Education*, 13(3), 199-205.

- Olubela, A., & Adebanjo, A. (2020). Learning Styles and Gender Effects on Secondary School Students' Learning Outcomes in Ijebu-Ode Community, Ogun State, Nigeria. *KIU Journal of Humanities*, 4(4), 155-169.
- Palupi, B. S., & Subiyantoro, S. (2020). The Effectiveness of Guided Inquiry Learning (GIL) and Problem-Based Learning (PBL) for Explanatory Writing Skill. *International Journal of Instruction*, 13(1), 713-730.
- Platt, A. (2020). Enhancement of learning & teaching practices in a challenging context: Evaluating the outcomes of a refreshed peer supported review process. *Innovations in Education and Teaching International*, 57(5), 602-612.
- Raharjo, H., Khairudin, M., & Abd Baser, J. (2018). The influence of problem-based learning and direct teaching on students' learning outcomes. *Jurnal Pendidikan Teknologi dan Kejuruan*, 24(1), 62-71.
- Rusmono, R., Winarsih, M., & Hardiansyah, H. (2019). *Effect of teaching material based on mobile learning to learning outcomes of natural environment*. Paper presented at the Journal of Physics: Conference Series.
- Sabatinie, I., Susilaningsih, E., & Kurniawan, C. (2019). Design of Submicroscopic Book and Improving of Students Learning Outcomes for Remedial Program in Class XI for Buffer Solution. *Journal of Innovative Science Education*, 8(1), 14-22.
- Sahabuddin, E. S. (2017). *The Use of Portfolio in the Implementation of Problem Based Learning Model to Improve Student Learning Outcomes*. Paper presented at the 2nd International Conference on Education, Science, and Technology (ICEST 2017).
- Saihu, S. (2020). The Effect of Using Talking Stick Learning Model on Student Learning Outcomes in Islamic Primary School of Jamiatul Khair, Ciledug Tangerang. *Tarbawi: Jurnal Keilmuan Manajemen Pendidikan*, 6(01), 61-68.
- Salas-Pilco, S. Z. (2020). The impact of AI and robotics on physical, social-emotional and intellectual learning outcomes: An integrated analytical framework. *British Journal of Educational Technology*, 51(5), 1808-1825. doi: <https://doi.org/10.1111/bjet.12984>
- Saputra, D. A. (2018). *The Implementation of Audio-Visual Learning Media Based on Ispring Quizmaker on Thematic Learning Materials About Heroes to Improve Fourth Grade Students' Activities and Learning Outcomes*. Paper presented at the 2nd International Conference on Education Innovation (ICEI 2018).
- Sari, D. P., Sitorus, M., Situmorang, M., & Sudrajat, A. (2020). *Implementation of Project-Based Learning Resources With Multimedia to Improve Student Learning Outcomes in Teaching Cation Analysis*. Paper presented at the The 5th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2020).

- Sugio, K. (2019). Application Of Methods For Playing Wall-Based Cancel To Improve Activities And Learning Outcomes Student Students Social Science World Material II. *Metafora: Education, Social Sciences and Humanities Journal*, 3(2), 54-65.
- Suwarno, S. (2021). Application of Learning Strategies Contextual Teaching and Learning (CTL) in Improving Student Learning Outcomes in Ancient and Modern Human Materials. *Metafora: Education, Social Sciences and Humanities Journal*, 4(1), 45-51.
- Wekerle, C., Daumiller, M., & Kollar, I. (2020). Using digital technology to promote higher education learning: The importance of different learning activities and their relations to learning outcomes. *Journal of Research on Technology in Education*, 21, 1-17. doi: <https://doi.org/10.1080/15391523.2020.1799455>