

## Improving Mental Activities by Using Project Based Learning Model for Elementary School Students

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### Abstract

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Project-based learning (PjBL) provides opportunities for students to be able to improve their learning activities. The objective of study is to investigate the use of PjBL in improving students' mental activity. The methodology used in this study is quantitative with quasi experiment. The sample was taken purposively by involving 40 elementary school students of grade IV. The research instrument is an activity sheet. Student activity was observed by observers consisting of two teachers who were present during the lesson using student activity observation sheets. Student activity observation sheets are made based on indicators of learning activities. The questionnaire was tested for validity and practicality. The results showed that the research hypothesis was accepted that learning with PjBL which was carried out in the experimental class was significantly different from the experimental class. The resulting tcount is 2.4130. While the ttable obtained is 2.0244. Because tcount is greater than ttable, the hypothesis is accepted. Based on the results of the study it was concluded that teachers need to design learning activities especially those that involve students' mental processes.

**Keywords:** Project based learning, mental activity, learning activity

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## INTRODUCTION

Learning is essentially an activity that involves the mental processes of students. The learning process does not only involve physical processes, but rather mental activities which include reading, writing, speaking, listening, critical thinking, creative and problem solving (Suryandari et al., 2018). One activity that involves all components of thinking and physical activity is facilitating students to produce a learning product (Suryana & Hidayati, 2020; Bentri et al., 2022). The highest level of students' cognitive domain is at the stage of being able to create. In this concept students are able to produce a learning product in the form of a tangible form of student work (Kartika Chrysti Suryandari 2017; Andriah & Amir 2021).

Learning that can facilitate students to work both individually and in groups includes project-based learning (Bentri et al., 2016; Suartama et al. 2020). In the process standard it is stated that to encourage students' ability to produce contextual work, both individually and in groups, it is highly recommended to use a learning model that produces contextual work, it is highly recommended to use a learning approach that produces real work, namely the Project Based Learning model (Taufiqy et al., 2016).

Project based learning is based on constructivism theory and is active student learning (student centered learning), the learning process through project based learning allows educators to provide direct learning experiences to students (Hidayati 2019; Muji et al. 2019). Project based learning (PjBL) learning model that uses a project/activity as its goal. Project-based learning (PjBL) focuses on student activities in the form of collecting information and using it to produce something useful for the lives of the students themselves and for others. By implementing project-based learning, students play an active role in learning. Learning activities are remembering, understanding, applying, analyzing, evaluating and creating. Project based learning makes it possible to facilitate differences in the expected competencies in each lesson. In project based learning students are given the task of developing themes/topics in learning by carrying out realistic project activities. In the application of project-based learning it can encourage the growth of independence, responsibility, self-confidence, analytical in students, as well as emphasizing student activity in the learning process.

Several research explain that project-based learning can improve student learning outcomes, because students get real and direct learning experiences (Handrianto & Rahman, 2018; Hidayati 2019; Muji et al. 2019). In this context students will have the ability to gain real competence in the learning process. The results of observations at the beginning of 2023 at three elementary schools in the city of Padang show that students are generally less active in learning. Researchers made observations on science learning. Many learning materials can be presented in a more real way with a number of real activities for students. However, this condition did not occur because the teacher did not understand how to link learning with relevant projects for students. Even though the concept is project-based learning in helping to increase students' positive attitudes towards the use of technology. To ensure the positive effects of project-based learning are achieved, attention must be paid to factors such as the materials for project-based learning, the extent to which the project is relevant to the level of the learner, the complexity of the project, the proper provision of support, prior knowledge and teamwork skills. Project-based learning is usually considered a teaching approach in which students respond to real-world questions or challenges through an extended process of inquiry (Rahman et al., 2022). The Project Based Learning model lays its foundation on project studies. An approach that positions students at the center of the learning process and prepares them for real life by exposing them to real life problems. It is an educational approach based on imagination, planning, and fiction, which puts the student at the center and brings real-life situations into the classroom.

Project based learning, namely the teacher trains student independence and is able to participate in group work, students and teachers have already decided what to make, but here the teacher has informed that at meeting I students are asked to bring tools and materials to be brought at the next meeting. Creating a project begins by forming each group that has been determined. Before starting to make the project, students are told by the teacher if the group that is the best in the project will get plus points and praise from the teacher. Not only from its implementation, proof that this Project Based Learning (PjBL) model can affect the improvement of student learning activities can also be seen from its advantages. The advantages of the Project Based Learning (PjBL) model are that it provides

enthusiasm and motivation to solve each problem, fosters enthusiasm for students in solving problems. able to educate students in working together to find hidden objects, create a happy atmosphere in learning, able to create fun learning for students, able to increase student self-confidence, and every student is active in mastering the material. So this advantage of the Project Based Learning (PjBL) model when applied in learning is that it is able to create fun learning for students, generate enthusiasm and enthusiasm for students in learning, and is able to create student activity in their study groups. In contrast to the Project Based Learning (PjBL) model, the conventional approach places students as learning objects that act as passive recipients of information. In general, the delivery of learning using the lecture, question and answer method, and assignments and the scientific learning process also has not run optimally. Teachers always dominate learning activities, while students receive more from the teacher. If the learning process only uses conventional methods and models, the learning activities that occur tend to be passive and have an impact on the low learning outcomes of students (Rosenlund et al. 2020). This can be seen when the research took place, students who were taught with a conventional approach showed a passive attitude. Students listen to the teacher's explanation, take notes, and answer the teacher's questions if the teacher asks. Do not have the initiative to communicate with fellow students to discuss matters related to the subject matter being studied. Then do the exercises assigned by the teacher. The dominance of the teacher in conventional learning results in students taking less active roles and listening more to explanations from the teacher than finding the knowledge, attitudes, and skills needed for themselves, because in learning students act as passive learning objects whose activities listen to the teacher's description, learn according to the teacher's teaching speed. and take tests regarding the material being studied.

### **Learning activity**

Learning activity is any activity carried out by someone to acquire new knowledge, skills, and attitudes or improve those they already have. Learning activities can be carried out in the classroom or outside the classroom, and can be in the form of reading, writing, listening, speaking, discussing, practicing, or attending training or courses (Ramadhani et al., 2021). Learning activities can also be carried out independently or with the help of a facilitator or tutor. One of the learning activities that need to be optimized in the learning process is mental activity. mental activity or mental activity is an activity that involves cognition or thought processes. It involves information processing, analysis, synthesis, evaluation and decision making. Some examples of mental activities include reading, writing, speaking, listening, calculating, critical thinking, creative thinking, and problem solving. Here are some learning activities

Table 1. Indicator of Learning Activities

<b>Learning Activity</b>	<b>Indicator</b>
<b>Visual Activity</b>	Present presentation slides
	Make pictures/diagrams
	Create a concept map

	Making exhibitions
<b>Oral Activity</b>	group discussion Oral presentation learning debate Role playing
<b>Listening activity</b>	Listen to the teacher's story Listening to music Listen to interviews Listen to podcasts
<b>Mental activities</b>	Solve story problems Solve puzzles Solve logic problems
<b>Writing activities</b>	Writing essays Journal writing Write reports

A number of these learning activities can be carried out by students in learning. Teachers can design learning models and strategies that allow students to be active in learning. One learning model that can be applied is project based learning (PjBL). Several previous studies found a relationship between PjBL and learning in elementary schools. The research entitled Project-Based Learning for Scientific Attitudes of Elementary School Students Based on observational and experimental material that utilizes the properties of light, the results show that developing scientific attitudes of elementary school students using the project-based learning model (PjBL) is significantly higher than the expository learning model. Furthermore, the results of research by Ardianti, et al (2017) entitled Implementation of Project Based Learning (PjBL) with the Science Edutainment approach to Student Creativity found that the project based learning model with a science edutainment approach can increase student creativity and activity. Therefore, it is necessary to change the habits of teachers who only rely on experience and feel lacking in using learning models as reasons that need to be addressed for the future (Musta'in & Handrianto, 2020; Roman et al. 2020). This article aims to find the implementation of PjBL to increase student learning activities.

## RESEARCH METHOD

The research method is quantitative experiment. The experimental research design used is the randomized control group only design. In this design, the authors used a group of research subjects from a certain population, then randomly grouped into two groups or classes, namely the experimental class and the control class. The experimental class was given (treatment) using the PjBL learning model, while the control class was given learning as usual, namely the conventional learning model. The sample in this study was taken purposively, namely fourth grade students at SD Kartika 1-11 Padang City. The sample was chosen because it has implemented the independent curriculum implemented in

Indonesia. Data from the control and experimental classes were then processed using the t test statistical analysis.

### Research Instruments

The observation sheet contains student activities in the learning process. From this observation sheet, data will be obtained about learning activities in science material making products in teaching materials at SD 1-11 Kartika Padang City in the experimental class which is taught using the PjBL model, and student activities in science material in the control class which is taught using conventional learning. Student activity was observed by an observer consisting of two teachers who were present during the lesson using student activity observation sheets. Student activity observation sheets are made based on indicators of learning activities.

To find out whether the questionnaire made is valid or not, it can be determined by calculating the product moment correlation coefficient ( $r_{xy}$ ) between the item scores (X) and the item scores (Y). Table 2 interprets the magnitude of the correlation coefficient. This is useful to know the validity level of the test. Once the correlation coefficient ( $r_{xy}$ ) is known, the next step is to consult the r product moment table values at 95 confidence intervals with n-2 degrees of freedom. Each item is said to be valid if ( $r_{xy}$ ) is greater than  $r_{table}$ .

Table 2. Instrument Validity

<b>1</b>	<b><math>r_{xy} = 0,4292</math> (VALID)</b>	<b>16</b>	<b><math>r_{xy} = 0,0518</math> (INVALID)</b>
<b>2</b>	$r_{xy} = 0,4889$ (valid)	<b>17</b>	<b><math>r_{xy} = 0,4655</math> (VALID)</b>
<b>3</b>	$r_{xy} = 0,3781$ (valid)	<b>18</b>	<b><math>r_{xy} = 0,4825</math> (VALID)</b>
<b>4</b>	$r_{xy} = 0,1731$ (invalid)	<b>19</b>	<b><math>r_{xy} = 0,4884</math> (VALID)</b>
<b>5</b>	$r_{xy} = 0,6253$ (valid)	<b>20</b>	<b><math>r_{xy} = 0,4393</math> (VALID)</b>
<b>6</b>	$r_{xy} = 0,3688$ (valid)	<b>21</b>	<b><math>r_{xy} = 0,4019</math>(VALID)</b>
<b>7</b>	$r_{xy} = 0,1738$ (invalid)	<b>22</b>	<b><math>r_{xy} = 0,4646</math> (VALID)</b>
<b>8</b>	$r_{xy} = 0,3732$ (valid)	<b>23</b>	<b><math>r_{xy} = 0,4367</math> (VALID)</b>
<b>9</b>	$r_{xy} = 0,4258$ (valid)	<b>24</b>	<b><math>r_{xy} = 0,5571</math>(VALID)</b>
<b>10</b>	$r_{xy} = 0,157$ (invalid)	<b>25</b>	<b><math>r_{xy} = 0,4127</math>(VALID)</b>
<b>11</b>	$r_{xy} = 0,4524$ (valid)	<b>26</b>	<b><math>r_{xy} = 0,5848</math> (VALID)</b>
<b>12</b>	$r_{xy} = 0,4408$ (valid)	<b>27</b>	<b><math>r_{xy} = 0,5307</math> (VALID)</b>
<b>13</b>	$r_{xy} = 0,1375$ (valid)	<b>28</b>	<b><math>r_{xy} = 0,3916</math> (VALID)</b>
<b>14</b>	$r_{xy} = 0,6107$ (valid)	<b>29</b>	<b><math>r_{xy} = 0,5153</math> (VALID)</b>
<b>15</b>	<b><math>r_{xy} = 0,6911</math> (VALID)</b>	<b>30</b>	<b><math>r_{xy} = 0,4358</math> (VALID)</b>

Reliability calculations are intended to determine the extent to which the measurement results remain the same (consistent), if measurements are taken twice or more, the same symptoms occur using the same measuring instrument. Testing the reliability of this questionnaire instrument uses the Cronbach Alpha formula. The next step to be taken is to interpret the magnitude of the correlation coefficient. This is useful to determine the reliability level of the test. Based on the results of the calculation of the reliability of the learning activity questionnaire

carried out, it was obtained a reliability of 0.871, which means that the questionnaire is in very high reliability criteria because it is in the range of 0.80–1.00.

## RESEARCH RESULTS AND DISCUSSION

Data on student learning activities in the experimental and control classes prior to action or implementation of learning. This learning activity test was given before the learning process was carried out in the two sample classes. This data aims to see and compare students' initial activities towards learning in the two class samples. The data can be seen in the following table:

Table 3. Student Activities (Pretest)

Class	Pretest	
	Average Score	Percent
Eksperiment	52,72	42,176
Control	54,36	43,488

Table 3 shows that the average learning activity of the experimental class students is lower than the average learning activity of the control class students. The average student learning activity in the experimental class prior to learning using the Project Based Learning (PJBL) model was 52.72 with a percentage of 42.176 in the low category. Furthermore, the average data on student learning activities obtained in the control class before learning was carried out was 54.63 with a percentage of 43.488 in the low category.

The score or average of learning activities obtained from both classes is still in the low category. This is because the treatment has not been implemented in learning activities. Even though the two data on student learning activity were still in the low category, the percentage of student learning activity in the control class was higher than in the experimental class. Based on the data above, student learning activities in the experimental class and control class before treatment can be described as follows.

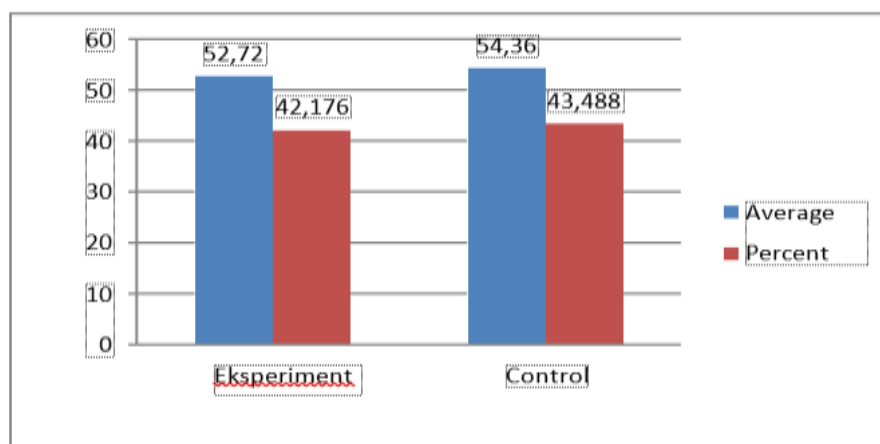


Figure1. Diagram Pretest

Data on student learning activities in the experimental and control classes after learning was carried out or after being given treatment. This learning activity test was given after the learning process was carried out in the two sample classes. This data aims to see and compare student activity towards learning in the two sample classes after the treatment is carried out, namely the Project Based Learning (PJBL) model in the experimental class and conventional learning in the control class. The data can be seen in the following table:

Table 4. Student Activity (Posttest)

Kelas	Postt	
	Average	Precent
Eksperiment	81,48	<b>64,18</b>
Control	<b>76,76</b>	<b>61,42</b>

Based on the table 4, it is known that the average student learning activity in the experimental class after learning using the Project Based Learning (PJBL) method was 81.48 with a percentage of 64.18% in the high category. This shows that the learning activities of students in this experimental class have increased when compared to the experimental class before being given treatment. Furthermore, the average student learning activity in the control class after learning was 76.76 with a percentage of 61.42% in the medium category. This also shows that the learning activities of students in the control class also increased when compared to before being given treatment. Although students in these two sample classes experienced an increase in learning activity, the data showed that after receiving treatment, student learning activity in the experimental class was higher than in the control class. Based on the data above, the average score of student learning activity in the experimental class and control class after treatment can be described as follows.

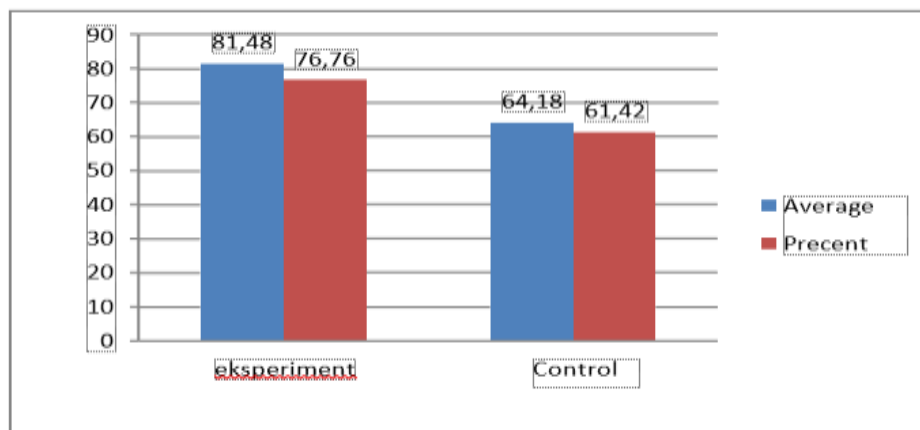


Figure2. Diagram Posttest

Based on the data analysis, it can be concluded that the learning activities of students who are taught using the Project Based Learning (PJBL) model are higher than the learning activities of students who are taught using conventional learning. This difference occurs due to differences in treatment in the experimental class and in the control class. This can be seen from the average results of the learning activity questionnaire for students taught with the Project Based Learning (PJBL) model which is 81.48 or higher than the average results of the learning activity questionnaire for students taught with a conventional approach with an average of 76,76. The results of data analysis were also strengthened by the results of testing the first hypothesis using the t test, the combined variance of the two samples was 26.22 for a significant level  $\alpha = 0.05$  dk 38, so the resulting tcount was 2.4130. While the ttable obtained is 2.0244. Because tcount is greater than ttable,  $H_0$  is rejected and  $H_1$  is accepted. This means that the learning activities of students who are taught with the Project Based Learning (PJBL) model are better than the learning activities of students who are taught with conventional approaches. Learning activities are all physical and mental activities carried out in the interaction process (teachers and students) in order to achieve learning goals (Nengsih et al., 2022; Prasetyo et al. 2022). Student learning activities during the learning process is an indicator of students' desire to learn. The activities referred to as teacher guidance direct students to be active in learning and seek solutions to problems, students learn to complete their assignments (Dehbi et al. 2023). Learning outcomes are certain competencies or abilities both cognitive, affective and psychomotor that are achieved or mastered by students after participating in the teaching and learning process (Busadeea & Laosinchaib, 2013). activities that lead to the learning process, such as asking questions, submitting opinions, doing assignments, and answering teacher questions properly. Student learning activities are influenced by many factors. One of them is the learning model used by the teacher during the learning process. Proof that student learning activities can be influenced by the learning methods used by teachers in the learning process is also evidenced by the results of research that researchers have conducted (Widikasih et al., 2021). This article uses two classes as a sample to compare the effect of the method on student learning activities. The first class as the experimental class was given treatment using the Project Based Learning (PJBL) model and the second class as the control class was not given treatment or used conventional methods. Based on the results of this study, it can be seen that the learning activities of experimental class students who are taught using the Project Based Learning (PJBL) model are higher than the learning activities of control class students who are taught by conventional learning (Jacobs et al. 2021). This research has revealed that the Project Based Learning (PJBL) model has a positive influence on student learning activities. The application of the Project Based Learning (PJBL) model in real learning, researchers see that students' interest in learning can be raised and students' attention to the learning provided by the teacher also looks good (Herrington & Kervin 2007; Lombardi & Oblinger, 2007). Students are also more active in learning, and student cooperation also looks good in group work. This is in accordance with the characteristics of elementary school-age children, namely, mastering the physical skills needed in games and physical activities, building a healthy life regarding oneself and the environment, learning to get along and work



in peer groups, learning to carry out social roles according to gender, developing skills basic in reading, writing, and arithmetic, able to participate in society, develop life concepts that are necessary in life. develop conscience, morals, and values as guidelines for behavior. achieve personal independence. Project-based learning allows students to develop according to their characteristics, because it makes learning more authentic (Tan et al. 2010).

## CONCLUSION

Based on the description above, from the research findings and data analysis that has been done, it can be concluded that there are differences in student learning activities taught using the Project Based Learning (PJBL) model and conventional learning. The results showed that there was a significant difference between the control class and the experimental class. The average value in the experimental class is higher than the control class. The Project Based Learning Model has an impact on student learning activities which is marked by increased student learning activity in each cycle. The Pjbl model can be learning activities.

## BIBLIOGRAPHY

- Andriah, A., & Amir, M. F. (2021). Mobile learning based on procedural and conceptual knowledge on fractional for elementary school. *Jurnal Ilmiah Sekolah Dasar*, 5(4), 567–567. <https://doi.org/10.23887/jisd.v5i4.40819>
- Bentri, A., Hidayati, A., & Kristiawan, M. (2022). Factors supporting digital pedagogical competence of primary education teachers in Indonesia. In *Frontiers in Education* (p. 786). *Frontiers in Education* 7, 929191. <https://doi.org/10.3389/educ.2022.929191>
- Bentri, A., Hidayati, A., & Rahmi, U. (2016). The problem analysis in applying instrument of authentic assessment in 2013 curriculum. *International Journal of Science and Research (IJSR)*, 1008-1012. <https://doi.org/10.21275/ART20162293>
- Busadee, N., & Laosinchai, P. (2013). Authentic problems in high school probability lesson: Putting research into practice. *Procedia-Social and Behavioral Sciences*, 93, 2043-2047. <https://doi.org/10.1016/j.sbspro.2013.10.162>
- Dehbi, A., Dehbi, R., Bakhouyi, A., & Talea, M. (2023). Survey analysis of students and teachers' perceptions of e-learning and m-learning in Morocco. *International Journal of Interactive Mobile Technologies*, 17(3), 102–22. <https://doi.org/10.3991/ijim.v17i03.36325>.
- Handrianto, C., & Rahman, M. A. (2018). Project based learning: A review of literature on its outcomes and implementation issues. *LET: Linguistics, Literature and English Teaching Journal*, 8(2), 110-129. <http://dx.doi.org/10.18592/let.v8i2.2394>
- Herrington, J., & Kervin, L. (2007). Authentic learning supported by technology: Ten suggestions and cases of integration in classrooms. *Educational Media International*, 44(3), 219-236. <https://doi.org/10.1080/09523980701491666>

- Hidayati, A. (2019, April). The analysis of influencing factors of learning styles, teacher's perceptions and the availability of learning resources in elementary schools in Padang, West Sumatra. In *Journal of Physics: Conference Series* (Vol. 1185, No. 1, p. 012149). IOP Publishing. <https://doi.org/10.1088/1742-6596/1185/1/012149>
- Jacobs, L., Wimpenny, K., Mitchell, L. M., Hagenmeier, C., Beelen, J., Hodges, M., ... & Adam, N. (2021). Adapting a capacity-development-in-higher-education project: Doing, being and becoming virtual collaboration. *Perspectives in Education*, 39(1), 353-371. <https://doi.org/10.18820/2519593X/pie.v39.i1.22>
- Lombardi, M. M., & Oblinger, D. G. (2007). Authentic learning for the 21st century: An overview. *Educause Learning Initiative*, 1, 1-12.
- Muji, A. P., Bentri, A., Suryana, D., Yaswinda, Y., Yulastri, A., Amir, A., ... & Hidayat, H. (2019). The effectiveness of the implementation of lesson plans based on entrepreneurial values in the kindergarten. *International Journal of Scientific & Technology Research*, 8(12), 121-128.
- Musta'in, M., & Handrianto, C. (2020). Peranan pengurusan sekolah berasrama islam nurul hakim untuk membangunkan sumber manusia masyarakat sekitar. *Jurnal Penyelidikan Sains Sosial (JOSSR)*, 3(9), 114-123. Retrieved from: <http://www.jossr.com/PDF/JOSSR-2020-09-12-15.pdf>
- Nengsih, Y. K., Handrianto, C., Pernantah, P. S., Kenedi, A. K., & Tannoubi, A. (2022). The implementation of interactive learning strategy to formulating learning objectives in package c program. *Spektrum: Jurnal Pendidikan Luar Sekolah (PLS)*, 10(2), 311-317. <https://doi.org/10.24036/spektrumpls.v10i2.117215>
- Prasetyo, W. H., Sumardjoko, B., Muhibbin, A., Naidu, N. B. M., & Achmad, M. I. (2022). Promoting digital citizenship among student-teachers: The role of project-based learning in improving appropriate online behaviors. *Participatory Educational Research*, 10(1), 389-407. <https://doi.org/10.17275/per.23.21.10.1>
- Rahman, M. A., Novitasari, D., Handrianto, C., & Rasool, S. (2022). Challenges in online learning assessment during the covid-19 pandemic. *Kolokium*, 10(1), 15-25. <https://doi.org/10.24036/kolokium.v10i1.517>
- Ramadhani, D., Kenedi, A. K., Helsa, Y., Handrianto, C., & Wardana, M. R. (2021). Mapping higher order thinking skills of prospective primary school teachers in facing society 5.0. *Al Ibtida: Jurnal Pendidikan Guru MI*, 8(2), 178-190. <http://dx.doi.org/10.24235/al.ibtida.snj.v8i2.8794>
- Roman, T. A., Callison, M., Myers, R. D., & Berry, A. H. (2020). Facilitating authentic learning experiences in distance education: Embedding research-based practices into an online peer feedback tool. *TechTrends*, 64, 591-605. <https://doi.org/10.1007/s11528-020-00496-2>
- Rosenlund, J., Sörme, L., Voxberg, E., & Augustsson, A. (2020). When appreciative inquiry guides action research: Collaborating to improve waste sorting. *Applied Environmental Education & Communication*, 19(4), 349-362. <https://doi.org/10.1080/1533015X.2019.1593264>

- Suartama, I., Setyosari, P., Sulthoni, S., & Ulfa, S. (2020). Development of ubiquitous learning environment based on moodle learning management system. *International Journal of Interactive Mobile Technologies* 14(4):182–204. <https://doi.org/10.3991/ijim.v14i14.11775>
- Suryana, F. & Hidayati, A. (2020). Analisis kebutuhan pengembangan model cooperative project based learning di era digital. *Journal of Vocational Education and Information Technology (JVEIT)*, 1(1), 13-19.
- Suryandari, K. C., Sajidan, S., Rahardjo, S. B., Prasetyo, Z. K., & Fatimah, S. (2018). Project-based science learning and pre-service teachers' science literacy skill and creative thinking. *Cakrawala Pendidikan*, 37(3).
- Tan, H. Y. J., Kwok, J. W. J., Neo, M., & Neo, T. K. (2010). Enhancing student learning using multimedia and web technologies: Students' perceptions of an authentic learning experience in a Malaysian classroom. *Curriculum, technology & transformation for an unknown future. Proceedings Ascilite Sydney*, 951-962.
- Taufiqy, I. R., Sulthoni, S., & Kuswandi, D. (2016). Pengembangan bahan ajar digital berlandaskan model guided-project based learning. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, 1(4), 705-711. <https://doi.org/10.17977/jp.v1i4.6228>
- Widikasih, P. A., Widiana, I. W., & Margunayasa, I. G. (2021). Online learning problems for elementary school students. *Journal of Education Research and Evaluation*, 5(3), 489-497.

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