

Improving Students' Responsibilities in Thematic Learning Through the Development of PjBL Model-Based Student Worksheets

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Abstract

The problem in this study is that students do not show a responsible attitude towards the learning activities they participate in, this is due to the absence of LKPD development to increase students' responsible attitude. The purpose of this research is to produce valid, practical, and effective project-based learning worksheets to improve students' responsible attitudes. The sampling technique was cluster random sampling, namely 28 students in class IVA at SD Negeri 3 Gedung (as an experimental class), and 30 students in class IVA at SD Negeri 3 Bumirestu (as a control class). Data collection techniques using test techniques, questionnaires and documentation. Test the hypothesis in this study using the independent t test technique.

Keywords

LKPD; Model PjBL;
Attitude of
responsibility



I. Introduction

Relevance to the Demands of 21st Century Education in the implementation of learning emphasizes the learning outcomes that students must have is the development of skills and attitudes that are relevant to the needs of the 21st century (Rohman, et.al 2020). One of these skills and attitudes is responsibility, initiative, and the ability to work in teams (Care and Kim 2018; Chiong and Jovanovic, 2012; Khasanova and Sanger 2018; Ozer, et.al 2015; and Trilling and Fadel, 2009). Through implementing learning in the 2013 curriculum an attitude of responsibility can be achieved, because the 2013 curriculum educational goals are more focused on the affective domain (Ating, 2023; Komalasari and Pardjono. 2015; Lestari, 2019. Murni, 2016; Rifai, et.al, 2019 and Susbiyanto, and Wilujeng, 2013). Attitude education in this school is better known as character education.

Character education is individual behavior in carrying out their duties and obligations, both towards themselves, society, the environment, the state and God (Mustari, 2011; Lestari, 2019. Murni, 2016. and Rifai, et.al, 2019). Formulation of character education to help students develop social aspects in Core Competency 2 (Ating, 2023; Komalasari and Pardjono. 2015; Lestari, 2019; Rifai, et.al, 2019).

Core Competencies 2 that must be developed for elementary school students are honesty, discipline, responsibility, courtesy, caring and self-confidence (Mustari, 2011 and Komalasari and Pardjono. 2015). Based on this opinion, one of the important characteristics that elementary students have from an early age is an attitude of responsibility (Murni, 2016; Rifai, et.al, 2019 and Susbiyanto, and Wilujeng, 2013). According to Komalasari and Pardjono (2015), an attitude of responsibility is the willingness to carry out one's duties and obligations, both to oneself, society, the environment, the State and God Almighty.

Instilling an attitude of responsibility is important in developing the moral values expected by the Indonesian nation (Ating, 2023; and Lestari, 2019), because students who

are used to being responsible for themselves and in their social environment, in the future can adapt to change (Komalasari and Pardjono 2015; Rifai, et.al, 2019), is committed to promises (Lestari, 2019; Susbiyanto, and Wilujeng, 2013), fulfills obligations (Murni, 2016 and Rifai, et.al, 2019), obeys regulations (Ating, 2023; Rifai, et.al, 2019 and Susbiyanto, and Wilujeng, 2013), respecting social values and norms (Lestari, 2019. Murni, 2016; and Rifai, et.al, 2019), active in social activities (Ating , 2023; Rifai, et.al, 2019 and Susbiyanto, and Wilujeng, 2013),and not get involved in several criminal and civil cases that harm him or the social environment around him (Lestari, 2019; Murni, 2016; and Susbiyanto, and Wilujeng, 2013).

The results of preliminary research were carried out by observing 25 fourth grade students at SD Negeri 3 Gedung, Palas District, South Lampung Regency, in general the attitude of responsibility in the aspect of commitment to promises, fulfilling obligations, obeying regulations, respecting social values and norms holistically there are still many that are low with a percentage of 56%. The results of these observations indicate the need for efforts to increase the attitude of responsibility of students. The low attitude of responsibility of students is caused by several factors including 1) Conventional learning is often focused on passive transfer of information, which does not provide many opportunities for students to develop collaboration skills in teams; 2) the teacher's assessment only focuses on knowledge,

The problems above are a challenge for teachers in developing an attitude of responsibility, because developing students' attitudes of responsibility in the learning process is not easy (Rifai, et.al, 2019 and Susbiyanto, and Wilujeng, 2013). Implementation of learning sometimes students often face challenges such as lack of motivation, indifference, and lack of awareness of responsibility. Therefore, a learning model is needed that can motivate students to develop an attitude of active responsibility.

The results of the research literature study found that the learning model that can help students to be active and build an attitude of responsibility is the Project based Learning (PjBL) model (Post and Mugara 2021; Rifai, et.al, 2019 and Susbiyanto, and Wilujeng, 2013) . The PjBL model is a learning model that involves students in project assignments that are real-world contexts (Rohman, et.al 2019; Zakiyah, 2019). The implementation of the PjBL model encourages students to work in teams collaboratively, take initiatives, and assume responsibility for the projects students work on (Laksono, 2018;Putri, and Astawan 2022; and Rohman, et.al 2018;), so that learning experiences provide relevance and motivate students to be responsible for project results (Gunawan, G., Sahidu, H., Harjono, A., & Suranti, NMY (2017;Laksono, 2018). Implementation of the PjBL learning model, one of the most important components according to (Fitri, et.al 2018; Dewi, et.al 2017) is a support system in the form of teaching materials which must also be available.

Teaching materials provide direction for the learning process that will be carried out (Komalasari, and Pardjono 2015). One of the practical teaching materials for use by students is the Student Worksheet (Arsana and Sujan 2021). Student worksheets act as a supporting tool for the implementation of the PjBL model in achieving learning objectives. In the context of this research, the development of the PjBL Model-based LKPD is designed to assist teachers in designing and compiling a series of learning activities that lead students to achieve an attitude of responsibility in project assignments.

Through this research, it is hoped that an effective PjBL Model-based worksheet can be developed in increasing students' responsible attitudes. The development of this LKPD is expected to provide clear guidelines, relevant challenges, and opportunities for students

to assume their responsibilities in learning. Thus, students can develop a strong attitude of responsibility that will have a positive impact on their lives.

II. Research Method

This research is a development research that aims to produce products that will be tested valid, practical and effective. The product developed is in the form of Project Based Learning-based LKPD development to increase the attitude of responsibility in thematic learning in class IV of elementary schools. The design of this development research is based on the adaptation of the development model steps from Borg and Gall (2003). There are ten steps in the development research model from Borg and Gall (2003), namely 1) initial research and information gathering, 2) planning, 3) initial product format development, 4) initial trial, 5) main product revision, 6) trial main field, 7) product revision, 8) operational field trials, 9) operational product revision, 10) dissemination and implementation. The ten steps of development research by Borg and Gall (2003) in this study the researchers carried out up to the eighth step, because at the field trial stage the products produced had been tested as valid, practical and effective. The details of the activities in this study can be explained as follows.

2.1 Preliminary Research and Information Gathering

This stage aims to conduct a preliminary study and needs analysis. implementation of the research phase and initial information gathering consisted of two activities, namely: 1) A literature study was conducted to collect concepts relevant to the development of Project Based Learning learning model-based worksheets. This stage is carried out to get an overview of the development of LKPD based on the Project Based Learning learning model which is ideal for increasing the attitude of responsibility in students in class IV of elementary school. 2) Field studies are carried out using data collection techniques, namely by questionnaires and interviews about the needs analysis of Project Based Learning model-based worksheets for educators and students.

2.2 Planning

In the planning stage, there were several activities carried out by the researcher, including 1) Assessing the curriculum by determining KI, KD in grade IV SD for odd semesters, which need to be developed in the learning process. 2) Formulate indicators and learning objectives as well as material to be developed based on the KD that has been selected, namely in Theme 2 "Always Save Energy" for odd semesters with the 2013 Curriculum and limited trials to Sub-theme 2 "Energy Benefits". And 3) Prepare a map of the needs of LKPD to find out how many LKPD are being developed.

2.3 Initial Product Development

The implementation of the initial product development stage in this study included several activities, namely 1) preparing teaching materials by researchers by designing student activity sheets based on the PjBL model, 2) developing learning process designs and 3) developing instruments for assessing attitudes of responsibility.

2.4 Early Stage Trial

Stage Preliminary field testing carried out with the aim of conducting validation tests, namely validation tests by material experts, media design experts, and linguists in accordance with the field of study and practitioner validation tests by colleagues. The validation process aims to determine the feasibility of learning resource products, in this

study the number of validator teams consists of 6 people. Aspects and indicators in the product feasibility assessment can be seen in the table.

Table 1. Indicators in product feasibility test

No	Rated aspect	Indicator
Material expert		
1	Content Eligibility	Suitability of the material with KD
		Material Accuracy
		Encourage curiosity
2	Eligibility of Presentation	Serving technique
		Presentation of learning
Linguist		
1	straightforward	sentence effectiveness.
2	Communicative	Understanding of messages or information.
3	Dialogic and Interactive	Ability to motivate students.
4	Compatibility with Student Development	Conformity with the intellectual development of students.
5	Compatibility with Language Rules	Grammar accuracy.
Media Design Expert		
1	Module size	LKPD size suitability with ISO standards
		Suitability of size with the content of LKPD material
2	Module cover design	Module cover layout.
		Module cover typography.
		Illustration of module skin.
3	Design module contents.	Module content layout.
		Illustration of the contents of the module.

The results of the assessment from the validator team then calculated the average value obtained from the results of the feasibility test, to be interpreted at the likert scale level. According to Widoyoko (2017) the results of calculating the average value of the assessment can be interpreted with reference to Table 2.

Table 2. Interpretation of product validity test results

No	Average Score	Interpretation
1.	$\bar{X} > 4,2$	Very valid
2.	$\bar{X} > 3,4 - 4,2$	Valid
3.	$\bar{X} > 2,6 - 3,4$	Pretty valid
4.	$\bar{X} > 1,8 - 2,6$	Less valid
5.	$\bar{X} \leq 1,8$	Invalid

2.5 Product Revision

Product revisions were carried out based on the results of the assessment, and suggestions from material experts, linguists and media experts on product trials. After going through validation tests by experts and also limited tests, then the product design is known for its deficiencies. Then the deficiencies of the product design are then corrected before being tested. This stage is the refinement stage of the developed LKPD product.

2.6 Main Field Trials

The main field test implementation aims to evaluate the practicality of the product. This main field test was carried out in a large group of 10 grade IV students at SDN3 Gedung. Assessment indicators in the practicality test can be presented in Table 3.

Table 3. Indicators in product practicality test

No	Rated aspect	Indicator
1.	attractiveness	Cover page display
		The title is displayed clearly so that it can describe the contents.
		Layout placement (titles, subtitles, text, images and page numbers).
2	convenience	The choice of font type, size and spacing used in the appropriate LKPD.
		The developed LKPD is easy to implement in learning.
		LKPD developed in accordance with the theme and KD developed.
		Have identity data to facilitate administration.
3	Language	LKPD uses good and correct Indonesian.
		The language used is clear and straightforward.
		The formulation of the instrument is not a sentence that causes multiple interpretations.

The results of the assessment of the responses of users of research products are then calculated by the average value obtained from the practicality test results, to be interpreted with a liket scale level. According to Widoyoko (2017) the results of calculating the average value of the assessment can be interpreted with reference to Table 4.

Table 4. Interpretation of product practicality test results

No	Average Score	Interpretation
1.	$\bar{X} > 4,2$	Very practical
2.	$\bar{X} > 3.4 - 4.2$	Practical
3.	$\bar{X} > 2.6 - 3.4$	Practical enough
4.	$\bar{X} > 1.8 - 2.6$	Less practical
5.	$\bar{X} \leq 1.8$	Not practical

2.7 Product Revision

After conducting product trials, it can be seen how the effectiveness of the products tested, then the product needs to be revised again to correct the deficiencies that still exist. This revision was carried out to improve the products that have been developed according to the conditions in the field.

2.8 Operational Field Trials

The implementation of operational field trials was carried out to test the increase in the attitude of responsibility of students after using Project Based Learning worksheets. The trial of this product was carried out with fourth grade students at SD Negeri 3 Gedung with a total of 28 test subjects, and as a control class in this study involved 30 students at SD Negeri 3 Bumirestu. The design for implementing the effectiveness test in this study used the posttest only control group design, details of the research subjects can be seen in Table 5.

Table 5. Research product effectiveness test subjects

No	Research subject	Number of students	Tritmen	Evaluation result
1	SD Negeri 3 Class IV building	28	PjBL-based LKPD	X1
2	SD Negeri 3 Bumirestu class IV	30	conventional	X2

Based on Table 5 it can be explained that the subjects of this study were class IV from SDN 3 Gedung and SDN 3 Bumirestu. The evaluation results data after the learning treatment will be analyzed using the one-tailed t-test. The one-tailed t-test hypothesis in this study is accept $H_0 (\mu_1 - \mu_2 \leq 0)$ if $t_{count} \leq -t_{\alpha/2; n+m-2}$. If H_0 is accepted, it means that the attitude of responsibility of fourth grade students in learning using the PjBL model-based worksheets is no better than students using conventional learning models. Indicators of aspects of the attitude of responsibility assessment can be presented in Table 6.

Table 6. Indicators of aspects of the attitude of responsibility assessment

No	Rated aspect	Indicator
1.	Carry out routine assignments given by the teacher	Complete assignments properly and on time
		Follows the instructions and rules set in the class or school
2.	Do the task until it's finished	Complete assignments on time
		Follow instructions and rules in carrying out tasks
		Responsible for materials or equipment borrowed from school or friends
3.	Collecting homework or school assignments well	Doing homework consistently and well.
		Collect homework on time according to the instructions given
4.	Responsibility for Cooperation and Involvement in the Group	Work well together in teams or groups.
		Responsible for completing group assignments and making relevant contributions
5.	Complete assignments individually on time	Carry out individual tasks properly and on time.
		Collect individual assignments according to the instructions given.
6.	Admit mistakes that have been made	Acknowledge and accept responsibility for mistakes made.
		Strive to improve and learn from these mistakes.

IV. Review of Literature

4.1 Research Results and Preliminary Information Gathering

a. Literature Study Results

The results of the research literature study get an overview of the implementation of the PjBL model which will be used as the basis for implementing the LKPD. The results of a literature study conducted by researchers (Ating, et.al 2023; Gulay, 2015; Fauzi, et.al 2019; Devi, et.al 2019 Putri et.al 2022; Rifai, et.al, 2019; Rohman, et. al, 2020; and Wulandari and Anggraini 2021) The PjBL model steps that will be used as the basis for developing LKPD are the PjBL model consisting of 1) asking questions; 2) planning; 3) make a schedule; 4) monitors; 5) assess and evaluate. The results of a literature study for details of activities in the PjBL stage of the developed LKPD can be seen in Table 7.

Table 7. Results of Literature Study

No	PjBL syntax	Implementation	Theory reference
1.	Ask	Providing learning stimuli in the form of questions to students so that curiosity arises to carry out investigations.	Devi, 2019; Gulai, 2015; Rifai, et.al, 2019
2.	Plan	Providing opportunities for students to identify problems and formulate them in the form of hypotheses and project work plans, this activity will train students' responsibilities.	Rohman, et.al, 2020; Putri et.al 2022
3.	Make schedule	Designing and determining project work time, as well as dividing tasks and responsibilities.	Devi, et.al 2019; Rohman, et.al, 2020; Wulandari and Anggraini 2021
4.	Monitors	monitoring of project results to reduce the risk of project errors	Putri et.al 2022; Rifai, et.al, 2019; and Rohman, et.al, 2020.
5.	Assess and evaluate.	Proving whether or not the hypothesis is set	Ating, et.al 2023; Fauzi, et.al 2019; Devi, et.al 2019 Putri et.al 2022; Rifai, et.al, 2019; and Rohman, et.al, 2020.

Based on the table, it becomes the basis for the implementation of the LKPD which is developed to increase the attitude of students' responsibility. Learning is carried out with reference to five learning steps, namely: 1) Asking 2) Planning; 3) Make a schedule; 4) Monitors; and 5) Assess and evaluate.

b. Field Study

The results of the field study needs to be obtained through the provision of questionnaires to teachers and students as research respondents as potential users of the product. The needs analysis questionnaire relates to the needs of teachers and students for the development of PjBL-based worksheets to practice responsibility. The results of the needs analysis in this study can be presented in Table 8.

Table 8. Results of the analysis of the needs of prospective product users

No	Question	Master's answer				Student Answers			
		1	2	3	4	1	2	3	4
1.	Learning is carried out by the teacher with a learning model carried out in a lecture and textual manner.	100%	-	100 %	-	75%	25%	80, %	20%
2.	The implementation of science learning is dominated by reading activities, summarizing material, and doing practice questions.	100%	-	100%	-	78%	22%	85%	15%
3.	The learning model used is lecture and question and answer.	100%	-	-	-	81%	19%	82%	18%
4.	Implementing the PjBL model.	-	100%	-	100%	15%	85%	84%	14%
5.	Using LKPD teaching materials for the science learning process.	-	100%	-	100%	-	100%	-	-

6.	Teachers and students need the development of worksheets based on the PjBL model in science learning.	100%	-	-	-	100%	-	-	-
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Based on Table 8 it can be explained that the learning phenomena that occur in IVSDN3 Building still dominated by lecture learning, reading activities, summarizing material, and doing practice questions. Students feel and need to develop worksheets that can help practice a responsible attitude in learning through project-based learning.

4.2 The results of the initial product planning and development stages

Researchers design research products in the form of PjBL-based LKPD by considering learning objectives, subject matter, appropriate PjBL problems or scenarios, learning steps, and relevant assessments. The product development plan to address the existing problems in SD is the development of PjBL-based worksheet products which contain five steps learning, namely: 1) Asking 2) Planning; 3) Make a schedule; 4) Monitors; and 5) Assess and evaluate. The form of the LKPD produced in this study can be seen in Figure 1.



Figure 1. Results of LKPD design based on the PjBL model

4.3 Early stage trials and initial product revisions

Stage Preliminary field testing carried out with the aim of conducting validation tests, namely validation tests by material experts, media design experts, and linguists in accordance with the field of study and practitioner validation tests by colleagues. The validation process aims to determine the feasibility of learning resource products, in this study the number of validator teams consists of 6 people. Aspects and indicators in evaluating product feasibility can be seen in table 9.

Table 9. LKPD product feasibility test results

No	Rated aspect	Average value		Holistic average	Interpretation
		Expert 1	Expert 2		
Material expert					
1	Content Eligibility	3,33	3,57	3.39	Valid
2	Eligibility of Presentation	3.00	3.67		
Linguist					
1	straightforward	4.00	3,33	3.68	Valid
2	Communicative	4.00	3.50		
3	Dialogic and Interactive	3.50	4.00		

4	Compatibility with Student Development	4.00	4.00		
5	Compatibility with Language Rules	3.00	3.50		
Media Design Expert					
1	Module size	3.00	4.00	3,28	Valid
2	Module cover design	3,13	3,25		
3	Design module contents.	3,14	3,14		

Based on Table 9, it can be explained that in the validity/feasibility test of LKPD as a whole from the feasibility aspects of language material and media design can be interpreted as valid/proper. The feasibility of the material, language and media assessed on the PjBL model-based LKPD will support and make it easier for teachers to implement the PjBL model. The results of these findings are also relevant to research (Fauzi, et.al 2019;Putri et.al 2022;Rohman, et.al 2020) which states that the implementationthe PjBL model will be more effective if it has a learning support system in the form of a proper LKPD. Some of the revisions made in the due diligence can be seen in Table 10.

Table 10. Revision in due diligence

No	Expert Team	Repair
1	Material Expert	1) Each stage of learning is adapted to the stages of the PjBL model; 2) The learning material is adapted to the KD formula; 3) Use language appropriate to the intellectual development of students
2	Linguist	1) Command/instruction sentences in LKPD should only use one effective and instructional command sentence; 2) Use effective sentences; 3) Use of proper spelling; 4) Pay attention to the use of semicolons, capital letters, and other punctuation marks.
3	Design Expert	1) It is recommended that the cover of the developed LKPD be adapted to the "Benefits of Energy" sub-theme which is the main topic of the developed LKPD material; 2) The choice of color and cover image should be more contrasting so as to attract students' interest to see and read it; 3) Pictures on learning materials should be personal documents, and write down the source.

4.4 Major Field trials and product revisions

The main field test implementation aims to evaluate the practicality of the product. This main field test was carried out in a large group of 10 grade IV students at SDN3 Gedung. The results of the assessment in the practicality test can be seen in Figure 2.

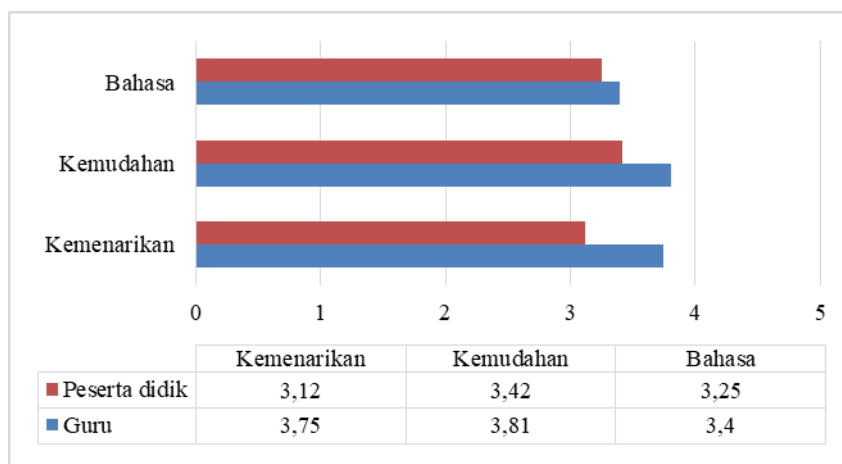


Figure 2. Assessment results in the practicality test

Based on Figure 2, in the aspect of assessing the ease of use of LKPD in learning and Availability, the highest percentage ratings are 3.42 and 3.81. The results of this assessment indicate that the LKPD developed can be used easily by teachers and students in implementing the PjBL model. Results The findings in this are relevant to the research of Komalasari and Pardjono. (2015) which states that practical LKPD can assist in the implementation of the PjBL model in learning.

4.5 Results of the Evaluation Stage

The results at this stage the researcher aims to measure the effectiveness of the product by conducting an initial test before giving the implementation of learning with PjBL-based worksheets. Product effectiveness test results are proven by calculating the tcount coefficient and comparing it with the ttable coefficient at the 5% degree of significance and degrees of freedom (n-1). The tcount results obtained value 38,563 while t table (5%;n-1) is 2,000. The right-hand test applies ($t \text{ count} \leq t \text{ table}$) accept H_0 and if ($t \text{ count} > t \text{ table}$) reject H_0 . From the results of the data analysis, $t \text{ count} > t \text{ table}$ is obtained, so that it can be interpreted that the critical thinking skills of students who use PjBL-based worksheets are better than the responsible attitude of students who learn using conventional models. The results of this study are relevant to the results of Novitasari's research (2018); Aish (2019); Miles (2019); Jamal (2016); Jamal (2014); Rifai (2019); and Brown (2019) who found that the application of the project based learning model can increase students' sense of responsibility. This can be supported by observational data on students' sense of responsibility in participating in classroom learning activities and completing project assignments.

V. Conclusion

Development of LKPD based on the PjBL model to increase the attitude of responsibility of students IVSDN3 Building effectively used. It can be seen from the difference in the attitude of responsibility between the experimental class and the control class. The average value of the critical thinking skills of the experimental class was 81.75 and the average value of the control class was 75.14. The difference in this mean became a benchmark for the success of developing PjBL-based worksheets to improve students' critical thinking skills.

References

- Alawiyah M., Sudarti, dan Prihandono T. (2015) Pengaruh Model Pembelajaran Project Based Learning Berbasis Pemanfaatan Barang Bekas Terhadap Sikap Ilmiah dan Hasil Belajar Mata Pelajaran IPA di MTs Kecamatan Jenggawah. *Jurnal Edukasi Unej*, II (1): 37-40.
- Arsana I.W.O.K, Sujana I.W. (2021). Pengembangan Lembar Kerja Peserta Didik (LKPD) Berbasis Project Based Learning Dalam Muatan Materi IPS. *Jurnal Imiah Pendidikan dan Pembelajaran*. Vol 5 No 1, 134-143.
- Ating F.C., Bistari, Salimi, A, Halidjah, S., Tampubolon, B. (2023). Pengembangan LKPD Berbasis PjBL Dalam Pembelajaran Matematika untuk Meningkatkan Sikap Tanggung Jawab Kelas V Sekolah Dasar. *FONDATIA Jurnal Pendidikan Dasar*. Vol 7, No 1, 200-210.
- Ayish, Nader. (2019). Student Perceptions of Responsibility for Their Own Learning and for Supporting Peers' Learning in a Project-based Learning Environment,

- International Journal of Teaching and Learning in Higher Education, 31(2). 224 – 237.
- Borg, W.R and Gall, M.D. (2003). *Educational Research: An Introduction* 7th Ed. New York: Pearson Education Inc.
- Brown, Benjamin D. (2019). *Evolving Project Based Learning Methodology at the Higher Education Level: A Need for More Guidance and Accountability*. *Alabama Journal of Educational Leadership*, 6(1). 10 – 19.
- Care, Esther and Kim, Helyn. 2018. *Assessment of Twenty-First Century Skills: The Issue of Authenticity*. Springer International Publishing AG 2018 E. Care et al. (eds.), *Assessment and Teaching of 21st Century Skills*, Educational Assessment in an Information Age, p 21-39. DOI 10.1007/978-3-319-65368-6_2.
- Chiong, R. & Jovanovic, J. 2012. *Collaborative Learning in Online Study Groups: An Evolutionary Game Theory Perspective*. *Journal of Information Technology Education*, vol. 11, 81-101.
- Devi, S. K., Ismanto, B., & Kristin, F. (2019). *Peningkatan kemandirian dan hasil belajar tematik melalui project based learning*. *Jurnal Riset Teknologi Dan Inovasi Pendidikan*, 2(1), 55–65.
- Dewi, N. P. C., Negara, I. G. A. O., & Suadnyana, I. N. (2017). *Pengaruh Model Project Based Learning Berbasis Outdoor Study Terhadap Hasil Belajar IPA Siswa Kelas V*. *Mimbar PGSD*, 5(2), 1–10.
- Fauzi, A., Siregar, H., Meilya, I.R. (2019). *Penerapan Model Pembelajaran Project Based Learning dalam Pembelajaran Mandiri pada Pendidikan Kesetaraan Paket C*. *Journal of Nonformal Education and Community Empowerment Volume 3* (1): 52-58.
- Fitri, H., Dasna, I. W., & Suharjo. (2018). *Pengaruh Model Project Based Learning (PjBL) Terhadap Kemampuan Berpikir Tingkat Tinggi Ditinjau dari Motivasi Berprestasi Siswa Kelas IV Sekolah Dasar*. *BRILIANT: Jurnal Riset Dan Konseptual*, 3(2), 201–212.
- Gulay, B. (2015). *Project Based Learning from Elementary School to College, Tool: Architecture*. *Procedia -Social and Behavioral Sciences*, 186, 770–775.
- Gunawan, G., Sahidu, H., Harjono, A., & Suranti, N. M. Y. (2017). *The effect of project based learning with virtual media assistance on student's creativity in physics*. *Jurnal Cakrawala Pendidikan*, 1(2).
- Jamal, Abu-Hussain & Oleg Tilchin. (2016). *Teachers' Accountability for Adaptive Project-Based Learning*. *American Journal of Educational Research*, 2016, 4(5). 420 – 426.
- Khasanova, G.F. and Sanger, P.A. 2018. *Collaborative Project-Based Learning in Training of Engineering Students*. Springer International Publishing AG 2018 M. E. Auer et al. (eds.), *Teaching and Learning in a Digital World, Advances in Intelligent Systems and Computing* 715.
- Komalasari, M. D., & Pardjono. (2015). *Pengembangan LKPD Terintegrasi Nilai Karakter untuk Mengembangkan Tanggung Jawab, Disiplin, dan Prestasi Belajar Peserta Didik Sekolah Dasar*. *Jurnal Pendidikan Karakter*, 6(1), 36-47.
- Laksono, A. D. (2018). *Keaktifan Model Project Based Learning (PjBL) terhadap Keaktifan dan Hasil Belajar IPA Kelas V SDN Sumberejo 2 Bonang*. *Jurnal Sekolah*, 2(2), 69-75.
- Lestari, P., Setiawan, A., & Puspitaningrum, A. (2019). *Urgensi habituasi nilai karakter kemandirian dan tanggung jawab peserta didik Sekolah Menengah Keguruan*. *Jurnal Ilmiah Ilmu Sosial*, 4(2), 114–119.
- Millah, Fadiyah. (2019). *Penerapan Model Project Based Learning untuk Meningkatkan*

- Sikap Tanggung Jawab dan Hasil Belajar Siswa. *Jurnal Pendidikan Guru Sekolah Dasar*. 21(8). 2.034 – 2.044.
- Murni, S. (2016). Meningkatkan hasil Belajar IPA, sikap tanggung jawab Dan kerjasama melalui model problem based learning. *Jurnal Pendidikan Guru Sekolah Dasar*, 5(29), 2781–2789.
- Novitasari. (2018). The Implementation of Project Based Learning To Improve Students Responsibility in Social Studies Learning, *International Journal Pedagogy Of Social Studies*, 3(2). 19 – 32.
- Ozer, O., Ayyildiz, I and Esch, N. 2015. Project-Based Learning in a World Focused on Standards. A. Sahin (Ed.), *A Practice-based Model of STEM Teaching*, 63–73. Sense Publishers. All rights reserved.
- Pasca I., Mugara R. (2021). Implementasi Penanaman Karakter Disiplin Siswa Melalui Membaca Dengan Metode Projrct Based Learning (PjBL) Dikelas II Sekolah Dasar. *Journal of Elementary Education Vol 04 No 02*, 222-230.
- Putri C.M., Audianti, E., Neli, Noviyant S. (2022). Implementasi Model Project Based Learning pada Muatan IPA Kelas V Sekolah Dasar di SD N 34/I Teratai. *Jurnal Pendidikan dan Konseling Vol 4 No 3*. 290-297.
- Putri, Ni.Luh.P.D, Astawan I.G. (2022). E-LKPD Interaktif Dengan Model Project Based Learning Materi Bangun Ruang Kelas V Sekolah Dasar. *Jurnal Pedagogi dan Pembelajaran Volume 5, Number 2, Tahun*, pp. 303-311.
- Rifai, S.S., Uswatun, D.A., & Nurasih, I. (2019). Model project based learning (PjBL) untuk meningkatkan sikap tanggung jawab ilmiah peserta didik di kelas tinggi. *JIPVA (Jurnal Pendidikan IPA Veteran)*, 3(1), 127-137.
- Rohman, F, Fauzan A, Yohandri. (2020). Project, Technology And Active (PROTECTIVE) Learning Model To Develop Digital Literacy Skills In The 21st Century. *International Journal of Scientific & Technology Research*. Vol 9, Issue 01, 12- 16.
- Rohman, F. Lusiyana, A., dan Rohim S. (2018). Modifying Model Project-Based Learning (PjBL) dalam Kegiatan Praktikum Optik untuk Membentuk Keterampilan Berpikir Kritis dan Pemecahan Masalah. *Edisi Publikasi Prociding Seminar PDS UNP*. Vol 1 No 1 (2018). 96-103.
- Rohman, F., Fauzan A., and Yohandri. (2019). Integration of technology in project based learning with tracker on practicum activities. *IOP Conf. Series: Journal of Physics: Conf. Series 1185 (2019) 012036*.
- Sari, R. T., & Angreni, S. (2018). Penerapan model pembelajaran project based learning (PjBL) upaya peningkatan kreativitas mahasiswa. *Jurnal Varidika*, 30(1), 79-83.
- Susbiyanto, S., & Wilujeng, I. (2013). Pengembangan perangkat IPA berbasis kurikulum 2013 untuk meningkatkan keterampilan proses, kejujuran, dan tanggung jawab. *Jurnal Pendidikan Karakter*, VI(1), 86–103.
- Trilling, B. & Fadel, C., 2009. *21st Century learning skills*. San Francisco, CA: John Wiley & Sons.
- Wulandari S.S., dan Anggraini P.D. (2021). Analisis Penggunaan Model Pembelajaran Project Based Learning Dalam Peningkatan Keaktifan Siswa. *Jurnal Pendidikan Administrasi Perkantoran (JPAP) Vol 9, No 2*. 292- 299.
- Zakiyah, I. (2019). Implementasion of PjBL Model to Increased Creativity and Self-Reliance of Student on Poetry Wriing Skills. *Journal of Primary Education*, 8(1), 51-58.