The Impact of Field Research on Student's Learning in A Prose Class at English Department, Faculty of Humanities, Andalas University Padang

Ferdinal Ferdinal^{1,*}, Seswita Seswita¹, Isramirawati Isramirawati¹

¹ Universitas Andalas, Department of English, Faculty of Humanities *Corresponding author. Email: ferdinal@hum.unand.ac.id

ABSTRACT

This article deals with the application of Project-Based Learning (PjBL) to writing skills at a university in Indonesia. It seeks to investigate to what extent field research impacts the improvement of students' writings. This study applies an experimental investigation that centers on 22 English undergraduates, the academic year 2020-2021. The results show that the subjects have positive attitudes towards project-based learning on writing. Specifically, PjBL offers at least three essential aspects of student performance. First, it has significant impacts on the student's writing skills, second on their positive attitudes, and last on their strategy in writing. PjBL can be implemented on a small scale class participants.

Keywords: Field Research, Learning Process, Prose Studies, Project-based Learning, Biography

I. INTRODUCTION

In today's era of science and technology, Indonesian education needs to be carried out professionally. To achieve this, the government (DIKTI) calls for higher education in Indonesia to refer to UNESCO's call on education through four learning pillars: learning to know, learning to do, learning to live together, and learning to be. However, in higher education, learning is left mainly to the lecturers in charge of the courses. Lecturers need to improve the learning quality applied with the excellent performance starting from designing, compiling, choosing methods, implementing, and evaluating. Lecturers must find appropriate and reasonable forms and learning models to achieve the targeted learning objectives. They design, implement, evaluate and follow up the learning process so that students can remember, understand, apply, share and use it themselves. This all needs to be done professionally, especially in finding the suitable learning model and learning strategy according to the subjects' specifics, including assessment.

Presidential Decree No. 8 of 2012 explains that *Kerangka Kurikulum Nasional Indonesia* (Indonesian National Curriculum Framework) (KKNI) may be a framework for grading the standard of competencies which will juxtapose, equalize, and integrate between the education sector and also the field of job training and work experience to acknowledge work competencies following the work structure in various sectors. These qualifications are often done through education, job training, and work experience. KKNI is additionally a national framework to improve the standard and competitiveness of the

state within the human resources sector, obtained by way of achieving the expected quality performed by the system in education, the national job training, and the equality of assessment system in the learning process.

Prose is a compulsory subject in the English Department, Faculty of Humanities, Andalas University, whose role is crucial in opening students' horizons to understand reading and writing skills. This course is one of the core courses in achieving the Learning Objectives of the study program. In this course, students understand prose studies, such as theory and practice. This course aims to make students understand these aspects as part of the formation of language skills. In this course, there are four targeted achievements: 1) Students recognize various forms of prose; 2) Students understand and interpret some types of prose; 3) Students understand and explore the relationship between fictional prose and reality; and 4) Students can read and write about the topics discussed in class. This course helps students understand some prose to produce competent graduates, either as teachers, researchers, activists, or scientists in English, literature, and culture. So far, the new teaching materials are in the form of handouts, books, articles, videos, and power points. These materials need to be developed into modules or textbooks to be better and more effective.

In prose studies, students study foreign works and cultures, such as British, American, and Australian, either through reading, viewing, or exposure. In this way, they know, understand, and absorb these cultures through writing or reading, partly in prose. The teaching method used is a mixture of lectures and assignments,



mostly done independently outside the classroom. There are no formal exams in this course. Independent tasks replace Mid Exam and Final Exam. Class and group discussions were carried out to understand the subject matter and help students understand. Their exposure to English-related cultures should be able to improve their understanding of Indonesian culture. Research in this class was normally conducted in libraries. The students generally have no experience in field research. Exposure to field works will for sure increase their level of mastery in any possible one, including the one in their villages.

We agree that research will help improve student researchers' knowledge, skills, and attitudes to the extent that other teaching methods may not provide or provide little. The three domains of learning work simultaneously to enable the students to complete their learning outcomes. Research-based learning is a teaching system that is authentic and problem-solving in nature with the point of view of problem formulation, problem-solving, communicating research results, which more broadly can improve the quality of learning. Widayati et al. (2010) said that research-based learning is a learning method with cooperative, problem-solving, authentic learning, contextual, and inquiry discovery approaches. This model targets students to develop critical, analytical, and evaluative thinking skills on a problem and provide field experience to students. This model requires students to generate hypotheses, seek information/data, collect, analyze, and draw conclusions from the data.

This investigation aims to explore the students' perceptions over the application of PjBL and find out to what extent PjBL impacts the students' language skills development.

1.1. On Problem-Based Learning

Research on PBL has been widely applied in different educational institutions, both national and international, formal and informal, and elementary and higher education levels. In Indonesia alone, several scholars investigated the application of this method at the university level. They include Sandika Ferdinal (2021), Yuniawardani & Mawardi (2018), Fakhriyah (2014), Wulandari, Sjarkawi & Damris (2011), and Sudarman (2007). They were interested in applying this method in various levels of education, from elementary schools to university education.

Usman (2006) said that field research is studying intensively about the background of the current situation and the interaction of a social, individual, group, institution, and community. Field research is also considered a broad approach

in qualitative research. Researchers go to the field to make direct observations about a phenomenon that occurs. This method is essential in transferring knowledge in education involves many interrelated aspects to obtain the expected learning outcomes. These fundamental aspects include learners, teachers, curriculum, teaching materials, and assessments. These aspects are needed in every learning model that is applied. Problem-based learning (PBL) is one learning model that is starting to be widely used today. PBL is believed to make learners more leverage transferring knowledge in psychomotor, and affective domains.

Scholars such as Barrett (2017), Ibrahim & Nur (2000), Slavin (1995) and Soekamto & Winataputra (1995) have introduced PBL as a learning approach that uses problems as found in real world as a context to trigger students to think critically. and solve problems themselves. Of the various types of PBL that are applied, PjBL is one of the most widely used in the classroom. PjBL must be relevant to produce learning that can develop students, including in the learning process, especially in creating written works and cultural products. With the PjBL approach, the Prose class will be interesting because the objects studied include real-world situations. In addition, the material studied will make students think, which will encourage students to learn to solve problems both individually and in groups. In its implementation, PjBL must be accompanied by a good and correct assessment. The performance of PiBL using outcome assessment also proves that learning is going well. For this reason, PiBL needs to be accompanied by a process assessment that can monitor and assist students in optimizing their potential in achieving the best results in completing assignments.

1.2. Learning Process

According to Slameto (2003: 54), there are some factors that influence the educational process. First, internal factors include physical health and disability, psychological aspects like intelligence, attention, interest, motive, talent, maturity, readiness, and fatigue factors. Second, external factors include family factors such as the way parents educate, relations between relations, home atmosphere, family economic conditions, and cultural background, school factors like teaching methods, curriculum, lecturer-student relations, student-student relations, school discipline, learning tools, school time, lesson standards oversize, building conditions, learning methods, and homework, and community factors which include student activities within the community, mass media, friends, and sorts of community life.



1.3. Research Methodology

The study utilized an experiment on a control group design. The investigation for this study was conducted in Semester IV during the 2020/2021 school year at the Faculty of Humanities, Andalas University, Indonesia.

1.4. Sample

There were 22 subjects from a prose class enrolled at the English Department, Faculty of Humanities, Andalas University. The participants were English students, comprising male and female students from different backgrounds. The students take this compulsory course in the fourth semester of their program. Their language proficiency was relatively low. So this project should enable them to articulate their ideas in writing through fieldwork.

1.5. Instrumentation

This study was performed for 4 months and employed the Self-Assessment Test and the Program Assessment Questionnaire. The test comprised questions about the PjBL approach during the investigation. The main objective is to find out the subject's views on PjBL approach application and look for what outcomes they have felt. The questionnaire on learning evaluation was distributed one week after the study's completion. The questions centered on assessing the influence of educational design on their study and on improving language skills. Self-assessment tests

and questionnaires were supposed to obtain students' opinions on the use of PjBL and how the students view learning using writing cases which they considered as appropriate methods as reminded by Dolman, Wolhagen & van der Vleuten (1998).

1.6. Data Collection Procedure

The PjBL method was assigned to the experimental class. The data were gathered from the subjects enrolled in the prose class during the experiment was undertaken.

1.7. Data Analysis

The research team obtained the data from the class, coded, calculated, and analyzed them descriptively.

2. RESULTS AND DISCUSSION

2.1 Results

In the first part, the experiment subjects were asked to rate their experience with the PjBL program. Overall, students perceived a PjBL study approach very differently. In terms of knowledge mastery as assessed through 10 questions, 50% of the subjects were successful in Cycle I but dropped to 20% in Cycle II. It showed that the students did not pay good attention to theory. Table 1 below shows the unmeasured average of questions about ten elements.

Table1 Test Results Cycles 1 and 2

Questions	Correct	Correct	%	%	+, -
	Answer	Answer	correct	correct	differe
	Cycle 1	Cycle 2	Cycle 1	Cycle 2	nce
How many paragraphs does an academic essay generally have?	17	21	77,3%	95,5%	18,2%
What is the first part of an essay introduction?	5	7	22,7%	31,8%	9,1%
Where is the thesis commonly written in an essay?	5	9	22,7%	40,9%	18,2%
What is the aim of a topic sentence (in body paragraphs)?	17	14	77,3%	63,6%	-13,7%
Below, which should be in the body paragraphs of an essay?	14	14	63,6%	63,6%	0%
In which paragraph do you need to write your thesis?	10	9	45,5%	40,9%	4,6%
Which do you need to write in conclusion after restating the thesis?	13	12	59,1%	54,5%	-4,6%
"I look to a day when people will not be judged by the color of their skin, but	16	19	72,7%	86,4%	13,7%
by the content of their character" (King). It is an evident example of?					
"One day, judging people on their looks will not be tolerated; instead, opinions	17	14	77,3%	63,6%	-13,7%
will be based solely on people's actions" (King). This statement is an example					
of?					
"A person's race should not matter" (King). This statement is an example of?	18	12	81,8%	54,5%	-27,3%
Total	132	131			

Source: Research Results

Comprehensively, the results show the increase in collective grades, from 17 to 21 (18,2%), the

highest, and 5 to 7 (9,1%), the lowest. The decrease of collective grades shows from 18 to 12



(-27,3%), the dominant, and 13 to 12 (-4,6%). One question remains the same.

Regarding their research diary, the results show that the subjects are interested in doing their projects. Yet, their interest decreased from the five aspects: writing plan, interview, impression, problem, and hope. All denote a constant decrease, the highest -0,5. The details can be seen in Table 2

Table 2 Research Diary Cycles 1 and 2

Activity	Questions	Results	Results	Average	Average	+
		from 22	from 20	Cycle 1	Cycle 2	-
		students	students			
		Cycle 1	Cycle 2			
Writing plan	Can you explain what you write? (scale 1-3:	55	51	2,50	2,55	-0,05
	not know, know much)					
Interview	Can you please explain what you have done	51	41	2,32	2,05	-0,27
	so far? (scale 1-3 : less, fair, much)					
Impression	Would you please explain what impresses	62	59	2,82	2,95	-0,13
	you when preparing and conducting the					
	interviews? (scale 1-3: fair, good, much)					
Problem	Would you mind explaining what hinders you	44	30	2,00	1,50	-0,50
	in preparing and writing your paper? (scale 1-					
	3: less, more, most)					
Hope	Explain what you hope from this writing.	66	60	3,00	2,73	-0,27
	(scale 1-3 : low, fair, high)					

Source: Research Results

In terms of learning attitudes, as a whole, the results show that there is an increase in 7out of 14 questions ranging from 75 to 88 (13%), the highest, and 62 to 63 (1%), the lowest. However,

there is also a decrease in percentage in two questions, ranging from 65 to 63 (2%), the lowest, from 93 to 73 (20%), the highest. One question received the same number of correct answers.

Table 3 Learning Attitudes Cycle 1 and 2

Questions		(Cycle	: 1			Cycle 2			Cycle 1		Cycle 2		
	1	2	3	4	5	1	2	3	4	5	Tot	Ave	Tot	Ave
I like to know how great authors write and apply the way to my writing.	-	-	2	17	3	-	-	6	11	5	89	4.05	87	3.96
I like to write down my ideas.	-	1	5	14	2	-	-	4	15	3	83	3.77	87	3.96
I want to send my writings to the media to be published.	-	4	15	3	-	-	6	13	3	-	65	2.96	63	2.87
I like to gather data and information before writing.	-	1	3	12	6	-	-	3	13	6	86	3,81	91	4.14
I can express ideas in my writings.	-	1	6	14	1	-	1	4	17	-	81	3.68	82	3.73
I feel confident when others read my writings.	3	6	6	6	1	2	4	12	3	1	62	2.82	63	2.87
They like reading what I write.	-	4	16	1	1	-	3	19	-	-	65	2.96	63	2.87
I love writing.	-	3	6	11	2	-	3	12	6	1	78	3.55	71	3.23
I love to see my ideas on paper.	-	2	8	8	4	-	1	9	11	1	80	3.64	75	3.41
I love to discuss my writings with others.	-	3	10	8	1	-	4	7	11	-	73	3.32	73	3.32
It is easy for me to write.	4	10	5	3	-	2	10	8	2	-	51	2.32	54	2.46
It is fun to collect data from field interviews.	-	-	3	11	8	-	6	4	11	1	93	4.23	73	3.32
I also collect data for an essay on my father's biography	-	4	1	11	6	-	2	2	12	6	75	3.41	88	4.00
by interviewing three of my family members.														
Observation and interviews expand my horizon on data for my writing topic.	-	-	4	13	5	-	1	4	13	4	69	2.14	72	3.28

Source: Research Results

1=Disagree much, 2=Disagree, 3=Not know, 4=Agree, 5=Do agree

Generally, in terms of learning strategies, the results show an increase in 8 questions ranging from 27%, the highest, and 9%, the lowest. However, there is also a decrease in percentage in

ten questions, ranging from 9%, the lowest, to 18%, the highest. Ten questions received the same number of correct answers.



Table 4 Learning Strategies Cycle 1 and 2														
Questions	Cycle 1						cle 2	2			Cycle 1		Cycle 2	
	1	2	3	4	5	1	2	3	4	5	Tot	Ave	Tot	Ave
Before writing														
I review my notes, handouts, and assignment before I write.	-	-	11	4	7	-	-	13	6	3	84	3.82	78	3.55
I learn the assignment and instruction carefully before	_	2	1	12	7	_	_	3	14	5	90	4.09	80	3.64
writing.														
I discuss what I will do with friends and teachers.	3	1	8	5	5	2	4	8	5	3	74	3.36	69	3.14
I jot down ideas and brainstorm before writing.	-	3	8	6	5	-	3	6	11	2	79	3.59	78	3.55
I make plans and notes in Indonesian before I write.	-	4	3	6	7	1	3	5	6	7	76	3.46	81	3.69
I write the outline in English.	-	4	3	8	7	1	6	8	5	2	84	3.82	67	3.05
Before writing the first draft, I learn at home first to	-	4	8	6	4	1	7	10	2	2	76	3.46	63	2.86
improve my writing skills.														
I use a grammar book or writing handbook to check writing	1	7	11	3	-	-	4	2	11	5	60	2.73	83	3.77
things I am unsure about before writing.														
I collect data and information as much as possible before	-	3	5	10	4	-	1	6	10	5	81	3.69	85	3.86
writing.														
I read similar writings as references before I write.	-	1	10	7	4	1	5	4	6	6	80	3.64	77	3.5
When writing														
I try to write in a comfortable place where I can	-	2	6	10	4	-	-	-	6	16	82	3.73	104	4.73
concentrate.														
I make use of my horizon to develop my ideas.	-	2	-	7	13	-	-	5	9	8	97	4.41	91	4.14
I like to write in Indonesian first and then translate it into	1	1	5	10	5	1	6	2	8	6	78	3.55	81	3.69
English.														
I like to write my draft in Indonesian and then translate it	-	5	5	7	5	1	5	7	6	3	78	3.55	71	3.23
into English.														
I edit my ideas while writing.	-	2	6	12	2	1	3	7	8	3	80	3.64	75	3.41
I edit the structure of my writing while writing.	-	2	9	9	2	1	5	7	6	3	77	3.5	71	3.23
I like to revise or clarify ideas while writing.	-	-	7	12	3	1	3	7	8	3	84	3.82	75	3.4
I like to quote essential data or information in my writing	-	-	7	13	2	2	3	6	7	4	83	3.77	74	3.36
and check its accuracy.				_			_		١.	_				
I like to paraphrase less critical information.	-	3	11	6	2	-	2	11	4	5	73	3.32	80	3.64
I like to summarize more complete writings.	-	1	9	11	1	-	1	8	11	2	78	3.55	80	3.64
After Writing	1	1	4	0	_		2	7	10		70	2.55	70	2.55
I appreciate myself for the writing.	1	4 3	4	8 7	5	1	3	7 5	12	7	78	3.55	78	3.55
I reread my writing to revise the contents and sharpen my	-	3	9	/	3	1	3	5	6	/	76	3.46	81	3.69
ideas.		2	1.1	6	3	_	2	1.4	4	2	74	3.36	72	3.27
I revised and improved my writing format. I edit for grammar, words, spellings, and m writing	-	$\frac{2}{4}$	11	6 11	3	_	3	14 11	4 5	3	79	3.59	74	3.36
mechanics.	-	4	4	11	3	-	3	11	3	3	19	3.39	/4	3.30
I use a dictionary after writing a draft.		5	4	11	2	_	3	5	9	5	76	3.46	82	3.73
I use grammar books after drafting.	-	6	7	7	2	_	4	4	11	3	71	3.23	79	3.59
I discuss my writings with friends to get feedback and ways	5	3	9	4	1	_	5	6	9	2	59	2.68	74	3.36
to improve them,	5	3	9	4	1	_	5	U	9	2	39	2.08	74	3.30
I read my friends' writings and suggest how t improve them	4	9	7	2		4	1	5	2	_	51	2.32	28	1.27
when necessary.	+)	l '		-	7	1				31	2.32	20	1.2/
I asked my friends to check and review my draft.	1	7	7	4	3	2	9	5	4	2	67	3.05	61	2.77
I check my English.	-	1	7	7	7	_	1	6	9	6	86	3.9	86	3.9
1 check my Enghon.	-	1 1	l '	l '	l '	1 -	1 1	ı	1 /	U	00	5.7	00	3.7

Source: Research Results 1=never, 2=rarely, 3=sometimes, 4=often, 5=most often



2.2. Discussion

Based on the test and observations at the research location, the authors determined the application of field research as an alternative to upgrading the learning outcomes of biographical writing for students in a prose class, Department of English Literature, Faculty of Humanities, Andalas University in 2021. At the beginning of the Cycle, students theoretically understood what they would do. However, after Cycle I was completed, the application of field research in writing biographies in Cycle I showed that learning with this approach could not be carried out following the learning design that had been prepared. The lecturers conveyed the lesson objectives to be achieved and had given students motivation to learn. However, there were still many students who were less active in understanding learning and carrying out assignments. On the other hand, lecturers could not effectively guide the students in completing projects and could not monitor group discussion activities during the action.

The learning process which had been implemented in the first Cycle as planned indicated that the class performance was still below the experiment target. Following such a

case, the second Cycle was conducted. Besides low average scores, many students had not reached the level of completion. The completeness of the Cycle I test results only reached50%. Based on this fact, the investigators took further action to cycle 2. Cycle 2 was then carried out in 3 meetings.

Furthermore, based on the results of learning cycle 2, it is known that there were only 11 participants who reached the scores of completeness. However, the results of their diary indicate relatively constant average scores as well as their learning strategies. Based on these results, it was decided to stop taking action because the investigators had improved the design. Still, it even got worse in some aspects. Besides, the pandemic caused the researchers could not monitor the process as normal situations could provide thoroughly. Yet, the majority of the subjects could finish their projects. Their answers to the questionnaire about the attitudes and learning strategies indicated that they showed a positive attitude toward this approach in Cycle I Test and Cycle II Test. These positive indicators can be shown in the form of a table as follows.

The test results showed increased collective scores, ranging from 132 in Cycle I to 131 in cycle 2.

Table 5 Student's Test Results

	Grade Average
Cycle I	132
Cycle II	131

Unfortunately, the number of students who completed (completeness) Cycle II decreased from those in Cycle I. The rise in mastery learning can be shown in Table 6 as follows. The results of the theory mastery test showed that the students had not mastered the theory. The test was given

to the same student with the same questions. In cycle 1, 11 students completed mastery of theory, and in cycle 2, 9 students were declared complete. The test results showed that for the test, the implementation of class actions in cycles 1 and 2 could not be said to be successful

Table 6 Student's Learning Completion

	Completeness	Completeness Percentage
Cycle I	11	50%
Cycle II	9	41%

The field research approach requires teacher and student activities as well as between students. The results of the implementation of the field research approach did not increase student activity in learning. Although the scores indicated a lower score, they remained in the domain of good attitudes, as described in the form of Table 7 below.

Table 7 Students' Attitudes

	Average on Scale 1-5
Cycle I	3.04
Cycle II	3.39



Similar to the aspect of attitudes, the application of field research in writing biographies did not increase the student learning strategies in learning, as seen in Table 8 below.

Table 8 Student's Learning Strategy

	Average on scale 1-5	
Cycle I		3.5
Cycle II		3.45

3. CONCLUSION AND IMPLICATION

3.1. Conclusion

According to the findings, PBL encourages teamwork and self-directed learning as two essential abilities for university students. When asked to rank their opinions of PjBL, the respondents in this study indicated that fieldwork had a more significant influence on their language skills. When asked to rate their perspectives on problem-based language acquisition, participants in the experiment answered that the program had a substantial effect on their writing skills. Still, the test results, the attitudes, and the learning strategies number of experimental participants are essential in executing this approach in a class. Although generalizations cannot be inferred from this small-scale study, this preliminary study has some educational implications. PjBL is suitable for language teaching in typical situations.

ACKNOWLEDGMENTS

This research was funded by The Institute for Educational Development and Quality Assurance of Andalas University.

REFERENCES

- [1] Barrett, Terry (2017) A New Model of Problem-based learning: Inspiring Concepts, Practice Strategies and Case Studies from Higher Education. Maynooth: AISHE.
- [2] Fakhriyah, F.2014. "Penerapan Problem Based Learning Dalam Upaya Mengembangkan Kemampuan Berpikir Kritis Mahasiswa." *Jurnal Pendidikan IPA Indonesia*, [S.l.], v. 3, n. 1, apr. 2014. ISSN 2089-4392. doi:https://doi.org/10.15294/jpii.v3i1.2906

3.2. The Implications

In summary, the investigation indicates that the PiBL approach significantly impacts students' learning, particularly on the writing process. The students may find out that the PjBL may upgrade the student's effort to complete assignments better when trying to accomplish problemsolving projects. The application of PjBL suggests that it might be practically effective because the approach triggers subjects to face world problems and manage to exchange their ideas where the atmosphere expects the participants to share and accept different viewpoints. They were also conditioned to face immediate risks, think critically, and come up with solutions to problems. However, the execution of the PjBL should be accompanied by some key elements such as the right implementation, the experimental design, the lecturer, and the participants.

- [3] Ibrahim, M & Mohamad Nur (2000).

 **Pengajaran Berdasarkan Masalah, Surabaya: Pusat Sains dan Matematika Sekolah, Program Pasca Sarjana Unesa, University Press
- [4] Perpres No. 8 Tahun 2012 menjelaskan tentang KKNI.
- [5] Sandika, Edria & Ferdinal. 2021. "The Implementation Problem-Based of Learning Improve Students' Competence in Writing Research Proposal in English Department, Faculty of Humanities, Andalas University." Conference Proceedings of the International Conference on Educational Development and Quality Assurance, ICED-QA 2019, 11 September 2019, Indonesia, Padang, 2(1): 1-8 https://eudl.eu/proceedings/ICED-QA/2019



- [6] Slavin R. E. 1995. Cooperative Learning Theory, Research, and Practice. Boston: Allyn & Bacon.
- [7] Slameto. 2003. *Belajardan faktor-faktor* yang *Mempengaruhinya*. Jakarta: PT. Rineka Cipta.
- [8] Soekamto dan Winataputra. (1995). Teori Belajar dan Model-Model Pembelajaran. Jakarta: Dirjen Dikti, Depdiknas.
- [9] Sudarman. 2007. "Problem Based Learning: Model Pembelajaran untuk Mengembangkan dan Meningkatkan Kemampuan Memecahkan Masalah." Jurnal Pendidikan Inovatif, 2 (2): 68-73.

- [10] Usman, Husaini, dkk.2006. *Metodologi Penelitian Sosial*. Jakarta: PT. Bumi Aksara.
- [11] Widayati, D.T., dkk. (2010). Pedoman Umum Pembelajaran Berbasis Riset. Yogyakarta: Universitas Gadjah Mada
- [12] Wulandari, Nadiah., Sjarkawi & Damris M. 2011. "Pengaruh Problem Based Learning dan Kemampuan Berpikir Kritis Terhadap Hasil Belajar Mahasiswa." Tekno-Pedagogi. 1(1): 14-24.
- [13] Yuniawardani, Vanny & Mawardi Mawardi. 2018. "Peningkatan Hasil Belajar pada Pembelajaran Matematika dengan Model Problem Based Learning Kelas IV SD." *Jurnal Riset Teknologi dan Inovasi Pendidikan*, 1(2): 24-32